

EXECUTIVE SUMMARY

This is the study of Environmental Impact Assessment of Establishment of M/S Amanat Petroleum Storage which is petroleum products storage and filling unit (Kerosine Oil, Light Diesel oil, M.T.T, Furnace oil and Solvent Oil) and site of the project is located at Muza Bheen Ke Tehsil Chunian District Kasur. At present site is open land and management of the project will start construction activities after obtaining environmental approval from EPA under section 12 of PEPA 1997 amended 2012.

Title of the Project: Said project is a Amanat Petroleum Storage and filling unit

Location of Project: Muza Bheen Ke Tehsil Chunian District Kasur

Name of the Proponent: Amanat Ali is a CEO of the said project.
Mailing Address: office No F 55 Auto center 108 Lyton Road Lahore
Contact No. 03008446788

Consultant Green Ways

Brief Outline of the Proposal

Said project is a petroleum products storage and filling unit with storage capacity of Kerosine Oil 23812 Liters, Light Diesel Oil 23812 Liters, MTT 23812 Liters, Furnace Oil 47624 Liters and solvent oil 100000 liters. The project cost shall be PKR 25 Millions approximately.

Total area of the plot is 6 kanals and 6 marlas where as 1 kanals will be the covered area of the project.. The project shall involve construction of office block, generator room, filling shed, fire pump area, vehicle parking shed. Guard room, wash rooms and kitchen.

According to Section-12 of PEPA 1997 (Amendment 2012), "No proponent of a project shall commence construction or operation unless he has filed with Provisional Agency an initial environmental examination or, where the project is likely to cause an adverse environmental effect, an environmental impact assessment EIA, and has obtained from the Provisional Agency approval in respect thereof." According to Review of IEE and EIA regulations-2000, the project falls under Schedule-II Any other project for which filing of an EIA is required by the Provincial Agency under sub-regulation (2) of Regulation 5., therefore requires an EIA. In that context, Environmental Impact Assessment has been carried out and is being presented in the form of this EIA Report.

The scope of the EIA study includes environmental assessment of the project including collection of data related to physical, biological and socio-economic

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environment, assessment of impacts which may be caused by the project activities and mitigation measures for the abatement of potential environmental impacts. This includes study of all the phases of the project.

Brief detail of the project is as follows:

The Project Area

The proposed project has been planned to be constructed at Muza Bheen Ke Tehsil Chunian District Kasur. At present site is open land and area is agricultural cum commercial in nature. Surrounding of the area is also agricultural in nature. Site where proposed project will be constructed is proponent own land and surrounding area is also proponent own land.

- Left Road
- Right Proponent own land
- Front Road
- Back Proponent own petrol pump

Knowledge on the baseline environmental conditions was obtained by collecting and reviewing the available secondary data of the project area. The review process was also helpful in establishing the scope and methodology for collection of field data inside the project area. The EIA team comprising of environmentalists, chemists, civil engineers collected area specific primary data.

Facilities

Kasur is the province of Punjab. A large number of various industries are located in the district. Kasur is a famous in leather industry. Site selected has infrastructure comparable to any area. Site has electricity, PTCL, road, local labor, water availability and all other facilities required to run the project..

After analyzing the needs of entrepreneurs, government has provided reinforced concrete road network, underground sewerage system, electricity distribution system, high pressure gas pipelines, potable water, telecommunications system near the project site.

Management of the project also ensured environmental compliance by developing and implementing environmental procedures, occupational health, safety, environmental awareness, solid waste and liquid waste management to run the project in a environment friendly way..

Availability of Utilities

Main source of electricity shall be from WAPDA. For adequate water supply, underground good quality water reservoir are available in the project site which will fulfill project need for workers, wash rooms and for other project purpose.

The summarized outline of the report has been described below:

Chapter-1: Introduction

In this chapter, an introduction to this report has been given. A little detail about project has been provided. Project background, purpose of the report, specific objectives of this EIA, identification of the project, details of proponent and consultant, project nature, size and location, extent and scope of study, EIA study team and study methodology have been described.

Chapter-2: Description of the Project

This chapter describes the specifications of the proposed project i.e. type and category of the project, project design, site layout, land use on the site, vegetation features of the site, road access, objectives, alternatives, cost and magnitude of operation, schedule of implementation, activities of construction and operation, processes and materials of the project, restoration and rehabilitation plans.

Chapter-3: Description of the Environment

This chapter describes the existing environmental conditions around the proposed project area. Information that has been collected from different sources including public, literature, reports of other studies conducted in this area, knowledge with the proponent and the concerned government departments and the first-hand surveys and field measurements has been presented in this chapter. This encompasses all the important aspects of local environment; such as physical, ecological and socio-economic resources. Environmental testing has also been carried out through an EPA-Punjab certified environmental laboratory to know about quality of ambient air, ground water and noise.

Chapter-4: Potential Environmental Impacts and Mitigation Measures

This chapter identifies the potential impacts due to the implementation of project on the physical, ecological and social environment of project area. This chapter also identifies measures that will help mitigate the project's adverse environmental effects and enhance positive impacts.

Major Impacts and Mitigation measures

The potential environmental impacts of the project, mitigation measures to be taken and proposed monitoring are summarized below:

Potential Impact	Magnitude of Impact	Mitigation Measures
CONSTRUCTION PHASE		
<p>Solid Waste</p> <p>Solid waste shall be generated in the form of excavation waste, broken bricks, wasted concrete material, wasted steel trimmings etc.</p>	Major/Long term	<p>All types of waste shall be kept segregated.</p> <p>The waste shall never be piled and shall be managed regularly.</p> <p>The construction waste shall be disposed off through construction waste contractors. The recyclable part of the waste shall be sold to recyclers.</p>
<p>Air Pollution</p> <p>Particulate matter may arise due to localized excavation in soil for foundation purpose and also due to movement of off-road or on-road automobiles.</p> <p>Transport of construction materials such as sand, aggregate etc. may also cause particulate pollution.</p>	Minor/Short lived	<p>Construction contractor shall be asked to ensure using only well-conditioned and tuned automobiles and equipment.</p> <p>Sprinkling of water on the exposed surfaces.</p> <p>Covering of all trucks loaded with sand, soil and other such loose construction materials.</p> <p>Regular sweeping of roads and parking areas to avoid deposition of dirt.</p>

<p>Cutting, grinding and welding of steel structures may cause air pollution.</p> <p>Off-road or on-road automobiles may also cause exhaust pollution.</p>		<p>Use of appropriate masks by workers to prevent entry of metal dust in their breathing system.</p>
<p>Water Quality</p> <p>Water shall only be needed for making concrete</p>	<p>Minor/Short Lived</p>	<p>Water consumption shall be kept at minimum.</p> <p>Leakage and wastage shall be prevented.</p>

<p>mix for foundations and also for pavement of floor.</p>		<p>Any wastewater shall be channelized to the drainage system of estate from where this shall be treated by centralized effluent treatment plant of before disposal to nearby drain.</p>
<p>Noise Pollution</p> <p>Operation of construction machinery and equipment may be a source of noise.</p> <p>Cutters, grinders and welding may also cause noise.</p> <p>Movement of off-road or on-road automobiles.</p>	<p>Minor/Short Lived</p>	<p>Maintain all the machinery and automobiles.</p> <p>Lubricate all moving parts of the machinery.</p> <p>Use of ear plugs by workers to prevent entry of noise in their ear.</p>
<p>Traffic Flow</p> <p>There shall be a little increase in the traffic of the area because of movement of transport carrying construction materials.</p>	<p>Minor/Short Lived</p>	<p>The construction material shall be transported during off-peak hours.</p>
<p>Occupational Health & Safety</p> <p>Work at height.</p> <p>Cutting, grinding, welding operations may cause metal dust and have electric hazards.</p> <p>Ergonomic issues due to loading and off loading of construction materials e.g. Cement sacks etc.</p>	<p>Minor</p>	<p>Work at height should be performed under supervision of HSE Officer who shall issue work at height permit after taking all appropriate measures.</p> <p>Construction materials should be distributed into small packs during loading and off loading.</p> <p>During hot season, jobs of the workers may be changed during peak hot hours. The work timing may be changed to prevent heat stress.</p>

<p>During hot season, workers may have to suffer from heat stress.</p>		<p>Electric earthing shall be done to prevent electric shock to workers.</p> <p>Safety shoes shall be worn by the workers while performing jobs related with electric equipment.</p> <p>Construction workers shall be provided with adequate awareness and training about HSE aspects of the project.</p> <p>They shall also be provided with suitable Personal Protective Equipment.</p> <p>Emergency preparedness and response plan shall be prepared and adhered to.</p>
<p>Ecology</p> <p>The birds may get scared due to noisy operations.</p> <p>The patch of land is already barren. There is no vegetation on it which is likely to be impacted.</p>	<p>Minor/Temporary</p>	<p>The noise of the equipment shall be kept under control.</p> <p>The construction staff shall be guided not to interfere with the habitat of local biota.</p>
<p>Socioeconomic</p> <p>Disturbance to local population</p> <p>Jobs for the locals</p>	<p>Minor/Temporary</p>	<p>The construction staff shall be guided to respect the local cultural and moral values and behave well.</p> <p>Locals shall be preferred for job so far as possible according to their competence.</p>
OPERATIONAL PHASE		
<p>Solid Waste</p>	<p>Major/Long term</p>	<p>All kinds of wastes shall be kept in segregated and color</p>

<p>Solid waste has been estimated to be generated in the form of workers camp.</p> <p>Operational waste shall be 10% of the raw material.</p> <p>Municipal waste.</p>		<p>coded bins.</p> <p>The municipal waste shall be stored in bins provided by and shall be managed by .</p> <p>It has been proposed to sell all of the packing waste to contractor for reuse and recycling as may be appropriate.</p> <p>Operational waste shall be sold to EPA-Punjab certified contractor.</p>
<p>Air Pollution</p> <p>The sources of air pollution shall be,electric generator and vehicles.</p>	<p>Minor/Long term</p>	<p>The electric generator shall be state of the art and shall have environment friendly technology to control air emissions.</p> <p>Workers shall be provided with masks.</p> <p>Only fit vehicles will be allowed for transportation of goods.</p>
<p>Water Pollution</p> <p>200-250 gallons of water shall be the operational requirement of water used for different activities.</p> <p>.</p>	<p>Minor/Long term</p>	<p>The septic tanks shall be constructed for treatmentof wastewater before ultimate disposal.</p> <p>Water wastage should be prevented.</p>
<p>Noise</p> <p>Noise shall be generated with operations of all</p>	<p>Minor/Long term</p>	<p>Better maintenance and lubrication of all the machinery shall keep the noise under control.</p>

kinds of machines and processes.		<p>Regular monitoring of noise may be carried out every year to check the efficacy of control measures.</p> <p>Enclosure/confinement of the machinery may also decrease the noise levels.</p> <p>Glass wool sheet installed with steel shed shall control noise because of its acoustic properties.</p> <p>Employees shall be provided with ear plugs to prevent entry of sound waves into ear.</p>
<p>Occupational Health & Safety</p> <p>Fire. Minor and major injuries. Loading and unloading of equipment injuries.</p>	Minor/Long term	<p>Training about OHS aspects may also assist in managing the risk.</p> <p>The workers shall be provided with all of the required personal protective equipment to prevent any harm.</p> <p>Fire extinguishers, fire hydrants, smoke detectors, electric earthing and sand buckets shall be installed.</p>
Ecology	Minor	The noise of the equipment shall be kept under control to

<p>The patch of land is already barren. There is no vegetation on it which is likely to be impacted. Therefore, there shall be no impact on biota due to operations.</p>		<p>prevent disturbance to fauna especially the birds.</p> <p>The operation staff shall be guided not to interfere with the habitat of local biota.</p> <p>The steel shed shall be lined with acoustic material sheets to absorb noise.</p> <p>The proponent as part of condition by PIEDMC, shall plant 1000 trees.</p>
<p>Socioeconomic</p> <p>Disturbance to local population</p> <p>Jobs for the locals</p>	<p>Minor/Temporary</p>	<p>The operational staff shall be guided to respect the local cultural and moral values and behave well.</p> <p>Locals shall be preferred for job so far as possible according to their competence.</p>
<p>Traffic Flow</p> <p>There shall be a little increase in the traffic of the area because of movement of raw materials and finished goods.</p>	<p>Minor</p>	<p>The transport shall be scheduled such that it may not cause traffic blockage.</p>

Recommendation for Mitigation measures

Pollutants	Recommendations during construction phase	Recommendations during Operation phase
<p>Health and safety issues</p>	<p>HSE Trainings of persons/labors involved in the construction and planning of the project is recommended</p> <p>PPEs should be provided to workers during constructional activities.</p>	<p>Training of workers should be conducted regarding health safety & Environment.</p> <p>Use of PPEs should be implemented at workplace.</p> <p>First aid measures/medical facility should be provided to project related employees.</p> <p>Safety signs should be placed inside the premises.</p> <p>Adequate firefighting system & Equipment should be installed</p> <p>Safety signs should be placed at all sensitive</p>

		<p>areas etc.</p> <p>Inspect the fire extinguishers on a regular basis to ensure it is in good condition, free from rust and housed properly.</p> <p>Avoid storage of hazardous. Waste</p> <p>Meet spill, overfill, and corrosion protection requirements</p> <p>Proper housekeeping should be ensured.</p>
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<p>Particulate matter (PM)/dust</p>	<p>Sprinkling of water is recommended during the construction</p> <p>All constructional raw material should be kept covered</p>	<p>PPEs should be provided to workers in case of particulate matter/dust suckers or dust collecting system should be installed in case of heavy dust</p> <p>All the places within the unit should be paved to avoid any dust emissions during loading/unloading of material and transportation of oil.</p> <p>Monitoring should be conducted as per PEQS.</p>
<p>Gaseous emissions</p>	<p>Constructional machinery and vehicles should be tuned and maintained</p>	<p>Regular maintenance of standby generator(s) should be ensured.</p>

	<p>properly</p> <p>All project vehicles should be checked regularly</p>	<p>PPEs should be provided to workers</p> <p>M/S Canal View Petroleum (HSD & DP retail outlet) should use good quality valves that will prevent the chances of leakage during the storage and handling.</p> <p>Regular monitoring and inspection for detection of leakage should be ensured.</p>
<p>Soil Contamination</p>	<p>Placed plastic sheets under leaching material to avoid leaching or the leaching material should be placed over concreted area.</p>	<p>Placed plastic sheets under leaching material to avoid leaching or the leaching material should be placed over concreted area</p> <p>Soil contamination will be controlled by maintaining leakage record of vehicles, and by regular inspection.</p>

<p>Noise</p>	<p>Vehicles to carry raw materials should be tuned properly and trainings for safe driving practices/HSE are recommended for drivers/machinery operators. Ear plugs/muffs should be provided in case of heavy noise</p>	<p>Ear plugs/muffs should be provided to workers in case of high noise during working hours Trainings for safe driving practices & HSE trainings of the employees and</p>
<p>Solid Waste</p>	<p>Constructional solid waste should be utilized for land filling purposes Domestic waste should be disposed-off properly, handed over to contractors, placed in bins</p>	<p>Project related waste should be handed over to contractors for safe disposal Waste bins should be placed at suitable places for the proposed facility Domestic waste should be handed over to contractors on regular basis Periodic cleaning of septic tank is recommended Proper solid waste management system should be adopted</p>

<p>Waste water</p>	<p>Waste water treatment system/septic tank should be installed to treat the water at PEQS prior to discharge into local drain Waste water from construction and domestic sources should be treated in septic tank before drained out.</p>	<p>Recycling plant will be installed in order to treat and reuse the water. Treatment system i.e. septic tank is recommended Waste water from domestic sources should be treated in septic tank Waste water from the unit should not be discharged into any water body or drain without treatment. Monitoring should be</p>
		<p>conducted on waste water as per PEQS.</p>
<p>Odor</p>	<p>The odor will not be produced during construction</p>	<p>Regular maintenance of oil storage tanks and valve is recommended</p>

<p>Impacts on flora and fauna</p>	<p>Land is almost clear, only few vegetation like shrubs, weeds, grasses are present</p> <p>No protected or sensitive species is present at site</p>	<p>Plantation should be done within and alongside of the boundary wall</p>
<p>Socioeconomic</p>	<p>People should be informed in advance when work is about to start at the project site.</p> <p>Local people should be preferred for the employment</p>	<p>Community wellbeing should be considered and anticipated measures are recommended to preserve the local culture and ecosystem</p> <p>Neighbor's privacy should be on priority.</p> <p>Local people should be preferred for the employment</p>

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent.

Proposed Monitoring

The purpose of monitoring is to get acquainted with actual quantitative assessment of environmental aspects to verify that their values are within permissible limits as defined by Punjab Environmental Quality Standards. Therefore, in order to remain rational with the help of quantitative assessments instead of merely making assumptions about status of environmental aspects, following environmental monitoring plan has been proposed:

Environmental Aspect	Parameters	Concerned Location	Frequency
Construction Phase			
Ambient Air	CO, SO _x , NO _x , O ₃ , PM	Project Site	06 Months
Ground Water	All parameters as described in PEQS	Water Connection at site	06 Months
Noise	Industrial Noise	Project Site	06 Months
Solid Waste	Generation Rate according to type of waste	Project Site	Fortnightly
Occupational Health & Safety	Fire, ERP, PPE's	Project Site	Daily
Operational Phase			
Ambient Air	CO, SO _x , NO _x , O ₃ , PM	Filling hall, Generator room/ hall	Annually
Exhaust Pollution	CO, SO _x , NO _x , O ₃ , PM	Electric Generator and vehicular exhausts	Annually
Waste Water	All parameters as described in PEQS	Waste Water Effluent from septic tanks	Annually
Noise	Industrial Noise	Filling hall, generator room	Annually
Solid Waste	Generation Rate according to type of waste	Solid Waste Bin	Fortnightly
Occupational Health & Safety	Fire, ERP, PPE's, Heat Stress	Whole unit	Daily

Chapter-5: Environmental Management Plan and Monitoring Program

This chapter presents the implementation mechanism in the form of an Environmental Management Plan (EMP) for dealing with the potential environmental impacts identified during EIA and reported in Chapter 4 of this document. This EMP addresses the adverse environmental impacts of the proposed project during its execution, to enhance project benefits and to introduce standards of good practices to be adopted for all project activities.

Environmental monitoring and management have been proposed to be carried out in all stages of the project namely; pre-construction, construction and operational phases. EMP will be operational to ensure legal environmental compliance. Environmental Monitoring by a third party will further support operations in environmentally sustainable fashion.

Chapter-6: Public Consultation

This chapter includes the output of consultations carried out with the people of the project area. These include local residents who also carry out different businesses such as shop keepers, farmers. Some of these include employees of surrounding area of the project. Their feedback regarding the project has been recorded through a questionnaire and interviewing them to fill the questions of questionnaire.

Chapter-7: Conclusion and Recommendations

This chapter recommends for issuance of environmental approval by EPA-Punjab. Construction of petroleum storage and filling unit will be under strict environmental management controls while sticking to the requirements of the Punjab Environmental Quality Standards (PEQS) and Punjab Environmental Protection Act 1997 (Amendment 2012). Therefore, project at the proposed site will have no adverse effects on any segment of the environment or on people of the area.

Conclusion

It is concluded that the project is a need as part of establishment of industries in the country. The project will accelerate socio-economic development and create job opportunities. The site has been examined with respect to the Pakistan Environmental Protection Agency guidelines and found to be in line with the criteria developed.

On the basis of the overall impact assessment, this has been concluded that environmental impacts during its construction and operational phases can be prevented with the mitigation measures included in this report.

1. INTRODUCTION

Project Background

Said project is a petroleum products storage and filling unit with storage capacity of Kerosine Oil 23812 Liters, Light Diesel Oil 23812 Liters, MTT 23812 Liters, Furnace Oil 47624 Liters and solvent oil 100000 liters. The project cost shall be PKR 25 Millions approximately.

Total area of the plot is 6 kanals and 6 marlas where as 1 kanals will be the covered area of the project. The project shall involve construction of office block, generator room, filling shed, fire pump area, vehicle parking shed. Guard room, wash rooms and kitchen

Purpose of the Report

Section-12 of the Punjab Environmental Protection Act, 1997 (Amended 2012) requires that for any development project to be commenced in Punjab, it is mandatory to obtain Environmental Approval from EPA-Punjab by filing an Initial Environmental Examination or Environmental Impact Assessment, as defined in Review of IEE/EIA Regulations, 2000 or recommended by EPA- Punjab. This involves impact assessment of such development on the environment. Section-12 reads as follows:

“No proponent of a project shall commence construction or operation unless he has filed with the Provisional 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 Provisional Agency approval in respect thereof.”

According to Section-12 of PEPA 1997 (Amendment 2012), “No proponent of a project shall commence construction or operation unless he has filed with the Provisional Agency an initial environmental examination or, where the project is likely to cause an adverse environmental effect, an environmental impact assessment EIA, and has obtained from the Provisional Agency approval in respect thereof.” According to Review of IEE and EIA regulations-2000, the project falls under Schedule-II Any other project for which filing of an EIA is required by the Provincial Agency under sub-regulation (2) of Regulation 5., therefore requires an EIA. In that context, Environmental Impact Assessment has been carried out and is being presented in the form of this EIA Report.

The purpose of this EIA report is to support an application for environmental approval from the EPA-Punjab. This is in compliance with many other national and international environmental laws besides PEPA 1997 (Amended 2012) for obtaining Environmental Approval (EA) before start of the project.

The study has been conducted according to Guidelines issued by
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Environmental Protection Agency-Government of Pakistan in 1997. Both primary and secondary data has been used to carry out the study. This EIA Report highlights environmental aspects of the project both during construction and its regular operation. It also provides necessary measures to be adopted to mitigate any adverse environmental impacts. It also gives information used to help decision makers i.e., EPA-Punjab, for issuing the Environmental Approval.

The proponent of the project is environmentally responsible. Therefore, considering its environmental obligations in addition to technical feasibility requirements, the proponent has proceeded for environmental feasibility of the construction and operation phase of the project.

The scope of the EIA study includes environmental assessment of the project including collection of data related to physical, biological and socio-economic environment, assessment of impacts which may be caused by the project activities and mitigation measures for the abatement of potential environmental impacts.

Specific Objectives of this EIA

The EIA study is aimed at promoting environmentally sustainable developmental activities. The specific objectives of this EIA include:

- Collection and scrutiny of data related to physical, biological, and socio-economic environment of the project area before commencement of the project in order to prepare baseline environmental profile
- Identification of environmental aspects of the proposed project area
- Identification, prediction and evaluation of likely environmental impacts of the proposed project
- Quantitative evaluation of the significance of the impacts
- Assess public perceptions and ensure the participation of all stakeholders in decision making
- Evaluation of public participation/consultation and identification of vulnerable groups present in the area
- Propose mitigation measures to keep the impact of the project activities within permissible limits i.e., PEQS
- Preparation of an Environmental Management and Monitoring Plan.
- To assist the proponent in receiving the environmental approval from the agency by fulfilling requirement of EPA-Punjab for EIA.
- To work closely with the project engineers to ensure that the project design includes environmental consideration

Identification of Project

According to Section-12 of PEPA 1997 (Amendment 2012), “No proponent of a project shall commence construction or operation unless he has filed with the Provisional Agency an initial environmental examination or, where the project is likely to cause an adverse environmental effect, an environmental impact assessment EIA, and has obtained from the Provisional Agency approval in respect thereof.”

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Green Ways as environmental consultant prepared EIA report of the M/S Amanat Petroleum Storage. Detail of consultant is as under.

Office No F 55 Auto Centre 108 Lyton Road Qartaba Chowk
Lahore.

Project Nature, Size and Location of the project

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Total area of the plot is 6 Kanals and 6 marlas. Total covered area of the plot shall be 1 Kanals. The project shall involve construction of a office block I&II, generator room, filling shed, fire pump area, filling pump shed.

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Guard room, wash rooms and kitchen shall be other parts of the project.

Extent and Scope of Study

The approach adopted for carrying out the EIA study includes review of the available secondary data, collection of primary data, analysis of collected data, establishing environmental baseline of the project related to physical, ecological & social aspects of the environment. Information relating to the physical, technical and environmental parameters is collected from the proponent and other agencies. Local inhabitants were interviewed in detail to understand the socio-economic, culture and customs of the area. An extensive literature review was also carried out in this step.

The impacts of the project activities on the physical, ecological and socio-economical resources in the immediate surroundings of the project area during pre-construction, construction and operational phases of the project have been assessed and where applicable mitigation measures have been proposed. Environmental management plan has been prepared for all of the phases so that the impacts can be within permissible limits.

Persons Performing the EIA Study

The proponent has received consultancy services from M/s Green Ways environmental consultant for carrying out environmental study and preparation of this final EIA report.

Study Methodology

This Environmental Impact Assessment (EIA) has been carried out to prepare this report according to "Guidelines for the preparation and review of Environmental Reports, October 1997," approved by the Government of Pakistan. The following steps have been followed for carrying out the EIA study of the proposed project:

Scoping

In this step, the limits of the study have been defined. The nature of proposal and its project area has been considered for defining the limits of the study. In order to avoid wastage of resources on unnecessary investigations, the aspects of physical, biological and socioeconomic aspects have been identified. Being located in a well-defined industrial estate, the study of most of the aspects was already covered.

Data Collection

It involves the collection of primary as well as secondary data in order to prepare the baseline profile of the project area. Various departments have been visited to collect relevant data. These include EPA, Geological Survey of Pakistan, Pakistan Meteorological Department and many others. The data regarding construction and operations of the project has been obtained through literature review and also from the proponent.

Group Discussion/Public Consultation

Detailed group discussion was carried out with various classes of people living in the surrounding areas. These were held in the open space available in the village. During the discussion, the relevant responses, opinions were recorded.

Interview

Local residents were interviewed. A semi-structured interview was used as a tool for data collection. Personal observations were also included in the methodology in order to collect relevant information about village and people of the community. They were asked about the project and their stakes relevant to it.

Primary Data

Quantitative data for baseline of ambient air, ground water and noise has been obtained through real-time monitoring of their samples by EPA-Punjab certified environmental laboratory.

Secondary Data

Secondary data was also used to collect important information regarding village, the people and the project. For this purpose, data provided by the project proponent and published data from other relevant sources were used. The previous reports prepared by other environmental consultants have also been consulted.

Qualitative Assessment of Impacts

The impacts of the project on the environmental resources during pre-construction, construction and operational phases of the project have been qualitatively assessed.

Mitigations Proposed

A range of cost-effective mitigation measures keeping in view of best available environmental options and best available techniques not entailing to environmental cost, have been proposed where applicable.

Environmental Management Plan

Environmental management plan has been prepared to manage the environmental impacts of the project during construction and operation phase of the project to ensure that impacts of the project remain within permissible limits of Punjab Environmental Quality standards.

Screening of the project required IEE or EIA

As per regulations said project falls under category II project requiring EIA,

hence EIA prepared and submitted to the department for obtaining environmental approval before the commencement of the project.

CHAPTER-2

DESCRIPTION OF THE PROJECT

2. DESCRIPTION OF THE PROJECT

This chapter describes the specifications of the proposed project i.e. type and category of the project, project objectives, project alternatives and reasons for their rejection, project location, project site layout, land use on the site and surroundings, topographic and vegetation features of the site, cost and magnitude of the project, activities involved in construction and operation, processes and materials involved in project, project implementation schedule, details of restoration and rehabilitation plans at the end of project life and government approvals.

Type and Category of Project

The proposed project involves construction of the petroleum products storage unit. Pak-EPA Review of IEE and EIA Regulations 2000 classify the projects under two schedules called Schedule-I and Schedule-II. Regulation 3 thereof reads that a proponent of a project falling in any category specified in Schedule I shall file an EIA with the Provincial Agency, and the provisions of section 12 shall apply to such project whereas Regulation 4 reads that a proponent of a project falling in any category specified in Schedule II shall file an EIA with the Provincial Agency, and the provisions of section 12 shall apply to such project.

According to the contents of these regulations, the proposed project falls under Schedule II.

“According to Section-12 of PEPA 1997 (Amendment 2012), “No proponent of a project shall commence construction or operation unless he has filed with the Provisional Agency an initial environmental examination or, where the project is likely to cause an adverse environmental effect, an environmental impact assessment EIA, and has obtained from the Provisional Agency approval in respect thereof.” According to Review of IEE and EIA regulations-2000, the project falls under Schedule-II Any other project for which filing of an EIA is required by the Provincial Agency under sub-regulation (2) of Regulation 5., therefore requires an EIA. In that context, Environmental Impact Assessment has been carried out and is being presented in the form of this EIA Report.

Therefore, it requires an Environmental Impact Assessment (EIA) in order to get Environmental Approval from Environmental Protection Agency-Punjab, Lahore.

Objective of the Project

EIA report is being submitted to Punjab Environmental Protection Agency in compliance with the legal requirements for Punjab Environmental Protection Act-1997 (Amended 2012) for obtaining Environmental Approval / NOC before starting construction and operation of the project as per section 12/14 of the act. Other relevant regulations and guidelines considered while preparation of this IEE report include.

- Policy and procedure for filing, review and approval of environmental approval.

- Guidelines for the preparation of and review of environmental reports.
- Guidelines for public participation
- Guidelines for sensitive and critical areas.
- Detail sectorial guideless.

Various aspects like environmental, social, physical and other aspects of the project both construction and operational are highlighted in the EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described.

Alternatives

Project Alternative

Management of the proposed project considered other sites at Pattoki Kot Radha Kishan but were rejected because of availability of residential setup near to project site, lack of infrastructure, nature of area was not commercial in nature. Site selected by the management is most suitable as area is agricultural cum commercial in nature and all basic infrastructure is present at project site. Further reason of rejection of above mentioned site are given below.

- Wastewater disposal drain was not exist
- Ground water quality was not good
- Land ownership conflict due to the land cost
- Site is located near residential area
- Thick vegetation cover was arising tree clearance issue

REASON FOR SELECTION OF PROJECT SITE:

- The land was selected due to the following reason:
- Economically feasible
- Trained or untrained workforce is available
- Availability of access roads

- Communication facilities
- Availability of electricity
- Basic infrastructure
- Sewerage system
- Approved drainage system
- Less/few vegetation/plantation
- Less fauna species at site

Construction Alternatives

The alternatives to the kind of structure of building which can be considered include RCC roof supported by pillars and beams. The other option may be double T roof supported by RCC pillars and beams. The price of PEB is much less than that of RCC roof and double T without compromising the structural stability. The PEB steel shed fulfills the design requirement for operations of this knitting and processing unit. Therefore it has been opted. Its benefits have been further elaborated as follows:

Benefits of Pre-Engineered Steel Structures

Pre-Engineered Steel Structures are the way of building in short time and save money. Steel structures provide great commercial and residential space. PEB's are ideal for non-residential and wide-span low-rise buildings. Some of the key advantages of PEB include:

- Low cost and economical, Low Maintenance Cost
- Safe and simple construction, faster installation
- Factory controlled quality
- Moveable and recyclable
- Environment Friendly
- Energy Efficient,
- Earth quake proof, wind Proof
- Durable, flexibility in expansion
- Easily adaptable in future modifications

Technology Alternatives

The technology and equipment proposed for petroleum products storage and filling unit shall be latest, updated and state of the art. This has proved to be environment friendly, energy efficient and material efficient as evident for similar kind and size of manufacturing units.

Location Alternatives

Management of the project considered other site for project construction like Pattoki, Kot Radha Kishan but was rejected due to lack of infrastructure and due to nature of site which was not commercial in nature.

Reasons for opting this Location

Reason for the site selection re stated below.

i) Raw material

Raw material needed for construction is readily available in the required quantity throughout the year. Raw material needed for operation shall Kerosine oil, Light Diesel oil, MTT, furnace oil and solvent oil. It shall be purchased from local suppliers within the countries.

ii) Basic Infrastructure

The project site is linked with the other parts of the country through a network of roads and rail. This shall facilitate fast, convenient and cost effective movement of the construction materials during construction phases and shall also provide convenience during operational phase of the project.

iii) Availability of water

Water required for project construction is plentifully available at the project site. For operations, small amount of water shall be needed for office, workers, kitchen etc. This shall also be needed for drinking, cooking and sanitation purposes. This amount of water can be met with ground water supply .

iv) Environment

The surrounding environmental conditions are congenial for the project. Both the construction as well as operation phases will not adversely affect the environment. All of the aspects will be kept strictly within the limits defined under Punjab Environmental Quality Standards (PEQS) and the project shall comply with Punjab Environmental Protection Act 1997 (Amendment 2012).

v) Utilities

All utilities such as electricity, gas, water, telecommunication including telephone and internet are conveniently available at the project site.

vi) Labor

Labor is easily and at cheaper cost available in the project area.

vii) Site Availability

The proponent project site is located at Mouza Bhankee Tehsil Chunian District Kasur and its proponent own land . The site is fully owned by the proponent. At present site is open land and agricultural cum commercial in nature .

viii) Site Access

Main Road and link roads infrastructure in present which gives access to the project site for the transportation of construction and operational goods.

ix) Energy availability

The power source during construction and operation will be from Water and Power Development Authority (WAPDA). Stand by generator will also be available to provide electricity backup in case of load shedding. One transformer of 100 KVA will be installed from the WAPDA.

Of all the alternatives examined on basis of above required criteria, the
AMANAT PETROLEUM STORAGE

present option merited on all others for project. Accordingly, the present site was selected and purchased.

Location and Site Layout of the Project

The proponent project site is located at Mouza Bhankee Tehsil Chunian District Kasur and its proponent own land. The site is fully owned by the proponent. At present site is open land and agricultural cum commercial in nature. Google map of the site is annexed with file. The map showing location of project area.

Land Use on the Site

At present site is open land and nature of area is agricultural cum commercial in nature. Surrounding of the area is also agricultural in nature and no human settlement is present near to the project site within the radius of 1.5 KM.

Road Access

Main Chunian Road and link roads infrastructure in present which gives access to the project site for the transportation of construction and operational goods.

Vegetation Features of the Site

Land is clear and there are no significant plants or vegetation present on site. Only spontaneous wild growth is present which is not of ecological importance. Different vegetation species that are found in the vicinity of project area includes the big trees, middle size trees, ground covers, shrubs, bushes, seasonal plants and climbers including Kandhari, Akash Bel, Peeli Booti, Datura and Dahlia etc.

Cost and Magnitude of Operation

The estimated capital cost of the project shall be PKR 25 Million approximately comprising construction cost 10million, land cost (5 millions) and machinery cost (10 millions).

Said project is a petroleum products storage and filling unit with storage capacity of Kerosine Oil 23812 Liters, Light Diesel Oil 23812 Liters, MTT 23812 Liters, Furnace Oil 47624 Liters and solvent oil 100000 liters. The project cost shall be PKR 25 Millions approximately.

Total area of the plot is 6 kanals and 6 marlas where as 1 kanals will be the covered area of the project.. The project shall involve construction of office block, generator room, filling shed, fire pump area, vehicle parking shed. Guard room, wash rooms and kitchen

Schedule of Implementation

The estimated period required for the implementation of project is 1 year. The implementation schedule is given in Table 2.1. The exact dates for each of the phases cannot be mentioned because of ambiguity about dates of issuance of various approvals. The construction schedule has been separately elaborated in Table 2.2.

Table 2.1: Implementation Schedule

Project Phases	Details	Expected Completion
Preliminary Phase	The land for project is acquired.	Already Acquired
Start-up Phase	Start-up of construction.	Immediately after getting submission approval.
Wrap-up Phase	Completion of Construction Phase	6 Months
Commissioning	Commissioning	01 Month
Operation phase	Start up	01 Month

Description of the Project

Proposed project will be Petroleum products Storage and Filling unit. Hence waste water and solid waste generation will be negligible. No heavy machinery will be installed in operational phase. Majority of the area is open land and will be used as parking for fuel tankers/ trucks.

For the construction of the proposed project during construction phase cement, sand, bricks, Bajri, iron rods will be required for the construction of the project while in operational phase management of the proposed project will store Kerosine oil, Light Diesel oil, MTT, furnace oil and solvent oil in tanks from where it will be refilled in cylinders for commercial usage for the local community and surrounding cities .

Material for the tanks , piping etc

The use of tanks for petroleum and other liquids has many advantages. These include space considerations, appearance, fire safety, and protection from the elements and from vandalism. However, unless installed and maintained properly, Petroleum tanks have the potential for leakage from the tank or related piping. These leaks can Exist undetected for years and cause pollution and some time chance of fire.

Materials of Construction

Tanks are usually made from either steel with a protective coating. Selection of tank type may depend on use and installation location. Fiberglass tanks are typically unsuitable for storage of heated materials, and for high load locations. However, they are lower maintenance and are not susceptible to corrosion. Steel tanks must be coated with a corrosion resistant coating, and corrosion protection is required. Contact plates at the bottom of the tank under fill and measurement ports should be installed. This prevents wear from measurement sticks hitting the bottom of the tanks.

Piping

Piping is usually steel with a protective coating. Other piping material may be copper or hydraulic flex hosing. Piping can be the same material as the tank or different. Metallic piping must be coated with a corrosion protective coating, and corrosion protection is required.

Working of the Unit

Working of the project is simple one as management of the project will purchase petroleum products from contractor and will store temporarily in storage tanks and then will be again refilled in trucks / vehicles for commercial purpose.

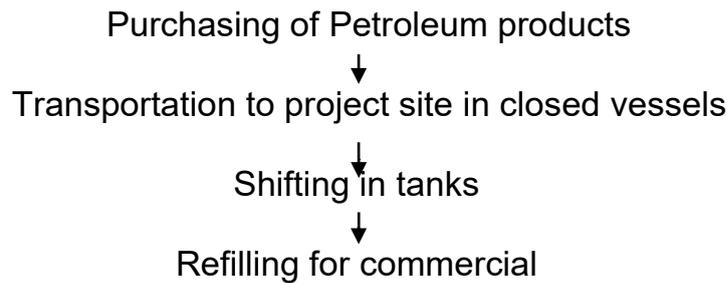
List of Machinery.

During construction and development phase below mentioned is a list of machinery which will be utilized for a specific period of time.

- Tractors
- Trolleys
- Trucks
- Cranes
- Expiators

Below mentioned is the detail of machinery which will be installed in operational phase.

- 5 fuel Storage tanks/ vessels
- Dispensers/ filling area
- Motors
- Generators
- Compressors



Process flow diagram of the project activity

Storage tank specification is as under.

- Capacity 5 tanks. Kerosine oil, Light Diesel
MTT 23812 liters, Furnace oil 47624 liters and solvent oil 100000 liters
- Design Pressure @ Temp 250 Psi @ 66 degree centigrade
- Vessel size ID 3335 x OL 13359
- Material SA 516 Gr 70

Construction plan is as under

- Total area of the land 6 Kanals and 6 marlas
- Covered area 1 kanals
- No of tanks 05 No
- Storage capacity 5 tanks. Kerosine oil, Light Diesel
MTT 23812 liters, Furnace oil 47624 liters and solvent oil 100000 liters
- Nature of project Petroleum products storage and filling point
- Nature of area Commercial
- Name of the proponent/CEO Amanat Ali
- Name of the project M/S Amanat Petroleum Storage
- Current status of the land Open land

WAPDA will be the main source of electricity and one transformer of 100 KVA will be provided by the WAPDA. One generator of 100 KVA will also be installed for back up electricity supply. 10 people obtain jobs during construction phase and 10 people during phase.

.Management of the proposed project will use Kerosine oil, Light Diesel, M.T.T , Furnace oil and Solvent oil as a raw material and temporarily stored in tanks and will be supplied to contractor/ consumers as per their demand.

Below mentioned is a list of machinery which will be installed during operational phase of the unit.

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- Storage tanks/ vessels
- Dispensers/ filling area
- Motors
- Generators
- Compressors

When a new tanks are required to be installed, the tank must meet certain design requirements as outlined below:

- Tank material must be steel with a factory applied corrosion
- Resistant coating. Tank tightness testing 3-6 months after installation.
- Contact plates required under all fill and gage openings.
- Corrosion protection (impressed current or sacrificial anode) required for all steel tanks and piping.
- Corrosion protection function test required annually.
- Double wall tanks and interstitial monitoring required

Complete project layout is attached as Annexure. It shall comprise construction work of main production hall and associated structures.

Pre-Construction Phase

The following activities will form part of the pre-construction stage:

- Conducting necessary feasibility studies including the cost benefit analysis and the expected internal rate of return.
- Preparation of the project documents, layout/master plan, architectural & engineering designs and the cost estimates.
- Conducting investigative studies such as geo-technical studies, environmental impact assessment, and economic feasibility studies.
- Obtaining registrations, approvals, and NOCs from different departments of the Government for business purpose.
- Selecting the appropriate and the best suited machinery and equipment for fast track implementation of the project and completion of construction within the scheduled timeframe.
- Signing the contracts for construction, procurements, installations, and implementation of the project facilities.

Construction Phase

Complete project layout is attached as Appendix. The project shall be accomplished according to bye-laws of city District Government.

The project shall comprise construction work of steel/ concrete shed building of main halls, office block, filling and storage area, fire pump shed. Other structures shall include kitchen and mess. Guard room of size 13'-1.5"X8'-6" shall have RCC roof slab. According to the requirement of management. 25' wide passage shall be left all around the boundary of the plot in order to facilitate movement of emergency rescue vehicles. Emergency exits shall also be designed. Separate drainage lines shall be laid for sewerage and storm water drainage. The main structure of roof shall be steel sheets supported by framework of steel rafter and columns. 10' high masonry walls shall also be made. The project construction shall be completed in about 6 months.

Table 2.3: Brief Description of the Project

Parameter	Description
Proponent & Owner	Amanat Ali
Project Location	Mouza Bheen Ke Tehsil Chunian District Kasur
Main Operations	Petroleum storage and filling
Operational Hours	16 Hours/day across two 8 hours shifts
Plot Area	6 Kanal 6 Marla
Project Covered Area	1 Kanals
Cost of the Project	PKR 25 Million approximately
Filling Capacity	20000 liter per day per category
Source of Raw Material	Contractors , suppliers and surrounding cities.
Solid Waste Management	Office, kitchen waste and fallen tree leaves etc.
Air pollution control	Catalytic convertor with electric generator. Good quality and fit vehicles will be allowed for the transportation of goods. Air conditioners. Exhaust fans. Provision of masks to workers.
Wastewater Management	Septic tanks shall be installed to keep the quality of wastewater within PEQS. Sewerage shall be temporarily held in septic tank for settling of solid contents. Then it shall be allowed for discharge in waste water disposal line located at the front of the project site. Most of the water will be recycled for watering plants etc.

Workforce Required

During construction phase of the project 12 persons will be required that will include masons and labors.

Water Supply and Water Balance

During construction phase of the project, ground water will be used. 30% Water shall be used for masonry work. Concrete mix shall not be prepared on the site. Ready mix concrete shall be brought on the project site to be used for foundations, slabs of guard room and office block. This shall need 60% water. 10% of the total needed water shall be consumed for sanitation purposes.

Power Supply

Electricity requirement during construction and operation phase shall be 100 KVA through WAPDA connection. The main source of power will be from WAPDA.

Operation Phase

The basic raw materials used in operational phase is Kerosine oil, Light Diesel oil, MTT, furnace oil and solvent oil which will be transported to the project site through trucks/ vessels and stored in tanks filled at project site .

Raw Materials

- 1) Kerosine oil,
- 2) Light Diesel oil, MTT,
- 3) M.T.T
- 4) Furnace oil
- 5) Solvent oil

Machinery Details

Most of the machinery shall be imported and in brand new condition. However, some of them may be from local manufacturers. Below mentioned is the detail of machinery which will be installed in operational phase.

- Storage tanks/ vessels
- Dispensers/ filling area
- Motors
- Generators
- Compressors

Operational Hours

The manufacturing unit will remain operational 16 hours/day across two shifts of 8 hours/day.

Water Requirement and Water Balance

Water shall not be required for operational process. It shall only be required for office, kitchen and wash room usage. Water shall also be needed for hygiene purposes in toilets or for irrigation of lawns. Overall requirement shall be 200-250 gallons per day. This requirement will be met from ground water supply.

Electricity Requirement

The estimated electricity required during operational phase of the project shall be met through a 100 KVA connection. This will be met from WAPDA. An
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electric generator of 100 KVA shall be kept stand-by in case of load shedding.

Man Power Involved in the Operation

10-12 persons shall be involved in the project operation. Administration shall involve CEO and General Manager. The staff shall be a mix of skilled and unskilled manpower. These shall comprise Plant Manager, Shift Supervisor, Machine Operator, Technician/Electrician and Helper.

Restoration and Rehabilitation Plans

First phase estimated life of the project is 50 years. Much before the project approaches end of its first life cycle it will be completely renovated, refurbished . All civil structures and related infrastructures will be extensively renovated. Even during its first life cycle, pre-emptive modifications, replacements and refurbishing will be carried from time to time under the "order of the day principle". This will ensure enhancement of the life of the project at very nominal costs. In this way the project life will be further enhanced for another hundred years or so.

All activities will be carried out in accordance with the prevailing environmental laws to avoid any damage to any segment of environment or human health around the project site.

The project site is owned by proponent and does not possess any environmentally sensitive areas which may need rehabilitation. However, after completion of construction activities, all kinds of waste either recyclable or non-recyclable has been proposed to be managed according to procedure laid down in Bye-Laws of PIEDMC and in line with legal provisions of district government laws. The surroundings shall be cleared out of all kinds of debris from construction activities.

Government Approvals Required for the Project

Environmental Approval from the EPA-Punjab, Lahore is the major requirement to start work on the project. For seeking approval from Environmental Protection Agency-Punjab, this Environmental Impact Assessment Report is being submitted.

So far Environment Approvals from the EPA, Punjab Lahore is the major requirement. Furthermore management of the project has obtained NOC from OGRA attached with file.

CHAPTER-3

DESCRIPTION OF THE ENVIRONMENT

3. DESCRIPTION OF THE ENVIRONMENT

General

This chapter describes the existing environmental baseline conditions in the proposed project area. An environmental baseline study is intended to establish a database against which potential project impacts can be predicted and managed later. The existing environmental conditions around the proposed project have been considered with respect to physical, biological and socio-economic aspects. For this purpose, only those environmental items from master checklist of environmental items have been considered which pertain to this project. Mitigation measures have been proposed in next chapter according to these physical, biological and socio-economic aspects defined in environmental baseline. The described information has been collected from foot survey, public consultation, literature, previous studies about project area, knowledge with the proponent and the concerned government departments. A site visit was conducted to survey the field area and to collect environmental data on physical, biological and socio-economic parameters. Real-time monitoring of samples of ambient air, noise and ground water has also been carried to know the baseline conditions.

Baseline Physical Environment

Topography

The topography of the project area is flat. The height of the area is 210 meters above the mean sea level (MSL).

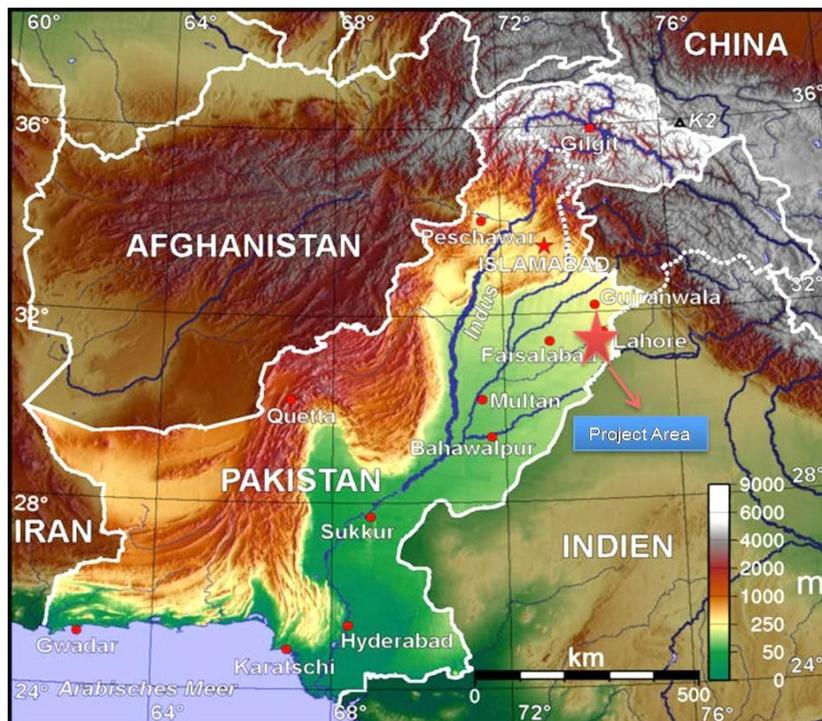


Figure 3.1: Topography of the Project Area

Kasur is a city to the south of Lahore, in the Pakistani province of Punjab. The city serves as the headquarters of Kasur District. Kasur is the 16th largest city in Punjab and 24th largest in Pakistan, by population.^[5] It is also known for being the burial place of the 17th-century Sufi-poet Bulleh Shah. It is farther west of the border with neighboring India, and bordered to Lahore, Sheikhupura and Okara Districts of Punjab.^{[6][7][8]} The city is an aggregation of 26 fortified hamlets overlooking the alluvial valleys of the Beas and Sutlej rivers

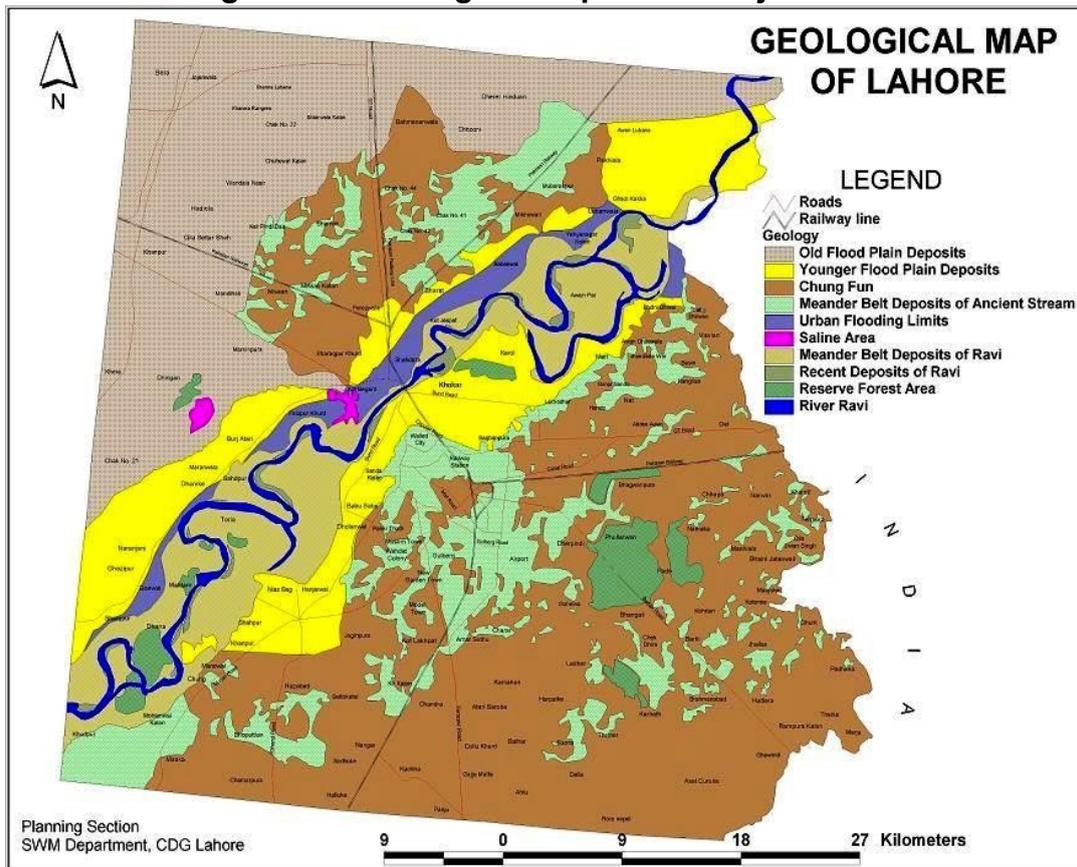


Regional Geological Conditions

Kasur is bordered to the north by Lahore, by India to the south and east, it also has borders with Okara and Nankana Sahab district. The city is adjacent to the border of Ganda Singh Wala, a border with its own flag-lowering ceremony.

Kasur is situated in a subtropical thorn woodland biome (Northwestern thorn scrub forests) and in the Deserts and xeric shrublands ecoregion according to the World Wide Fund for Nature's map of ecological regions in the world.

Figure 3.2: Geological Map of the Project Area



The presence of old channels of River indicates conformity of the stream oscillation to terrestrial rotation in the deflection of the streams. The abrupt migration shows excessive flooding due to which the earlier channels were choked with sediments and streams were forced to create new channels. These alluvial deposits comprise earthy brown to black silt, sand, and clay. The beds are largely hard, laminated, and sandy with inter-beds of clay and layers and lenses of sand. Project site is located in meander belt deposits. The project area does not have any valuable minerals. Although, scientific in depth, investigations haven't been carried out, yet the surveys conducted have failed to discover any minerals worth the name till to date. The economic minerals are kallar, kankar, sand, and clay.

Kallar is the grey powdery substance collected and taken out from the old village sites and other deserted abodes in the district. It is used for the manufacture of crude salt peter and also as manure for the top dressing of young cotton and tobacco plants (no longer in the line of extensive cultivation). With the passage of time the demand for Kallar diminished and its use as a trading commodity is on the decline. Kankar is used for metaling roads and its smaller particulars are burnt for lime. It is a kind of limestone gravel and is found, after being dug out at a depth varying from one to eight feet, in many parts of the district particularly the uplands.

Soil

The vegetation carried by these soils is influenced by moisture and aeration. The soil in the project area is cohesionless and is of alluvial type deposited by Sutlaj River. Various soil layers below the ground level includes: silt, silty clay, silty sand, poorly graded sand with silt, lean clay etc. Soil Map of the project area is given in Figure 3.3. The soil is different in character and generally inclined to be dry. However, it is rich in potential plant nutrients. Soil is rich in potential plant nutrients. Alluvium is soil or sediments deposited by the river or other running water. Alluvium is made up of variety of materials including fine particles of silt and clay and larger particles of sand and gravel. A river is continually picking up and dropping solid particles of rock and soil from its bed throughout its length. Where the river flow is fast, more particles are picked up than dropped. Where the river flow is slow, more particles are dropped than picked up. Areas where more particles are dropped are called alluvial or flood plains and the dropped particles are called alluvium.

The soil of the project area is fertile. Wheat and corn are the major crops. Rice at some places where water is available is also grown. However, vegetables, pulses legumes and fodder are the other crops.

Irrigation is largely dependent on the canals. Tube wells have also been sunk at the greater depths in the project area where fresh water is available.

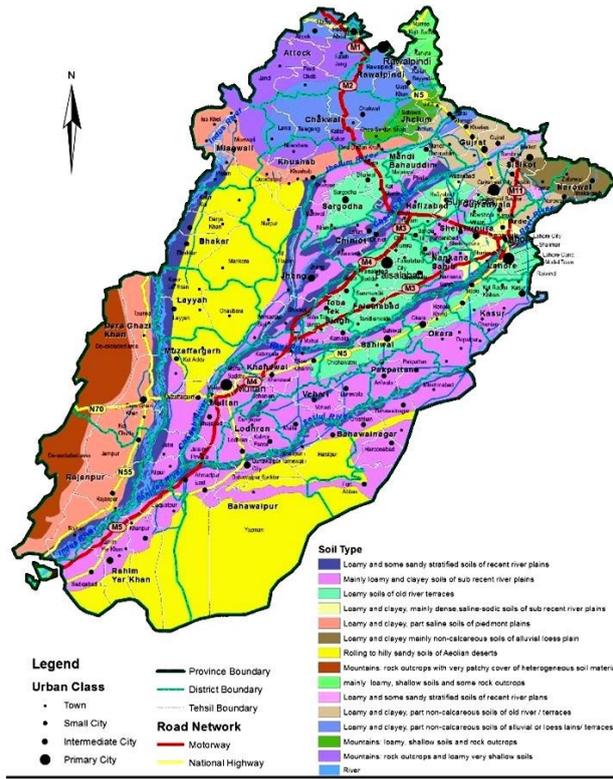


Figure 3.3: Soil map of the project area

Climate

Kasur has a hot semi-arid climate), bordering a humid subtropical climate. Kasur has extremes of climate; the summer season begins from April and continues till September. June is the hottest month. The mean maximum and minimum temperature for this month are about 45 °C (113.0 °F) and 27 °C (80.6 °F) respectively. The winter seasons lasts from November to February. January is the coldest month. The mean maximum and minimum temperatures for the coldest month are 22 °C (71.6 °F) and 0 °C (32.0 °F) respectively. With rainfall towards the end of June, monsoon conditions appear and during the following two and a half months the rainy season alternates with sultry weather. The winter rain falls during January, February and March, ranging from 23 millimetres (0.91 in) to 31 millimetres (1.2 in). Water logging and salinity have affected a large area of the district, making the underground water brackish

Climate data for Kasur, Pakistan

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	27.0 (80.6)	31.0 (87.8)	37.0 (98.6)	43.0 (109.4)	47.0 (116.6)	48.0 (118.4)	42.0 (107.6)	39.0 (102.2)	39.0 (102.2)	37.0 (98.6)	38.0 (100.4)	29.0 (84.2)	48.0 (118.4)
Mean daily maximum °C (°F)	21.0 (69.8)	22.0 (71.6)	28.0 (82.4)	35.0 (95.0)	39.0 (102.2)	39.0 (102.2)	36.0 (96.8)	35.0 (95.0)	35.0 (95.0)	32.0 (89.6)	27.0 (80.6)	22.0 (71.6)	30.9 (87.6)
Daily mean °C (°F)	14 (57)	19 (66)	19 (66)	24 (75)	27 (81)	27.5 (81.5)	27 (81)	26.5 (79.7)	25.6 (78.1)	24 (75)	20 (68)	18 (64)	22.6 (72.7)
Mean daily minimum °C (°F)	6.0 (42.8)	10.0 (50.0)	14.0 (57.2)	20.0 (68.0)	24.0 (75.2)	25.0 (77.0)	24.5 (76.1)	24.0 (75.2)	21.0 (69.8)	18.3 (64.9)	12.0 (53.6)	6.6 (43.9)	17.1 (62.8)
Record low °C (°F)	-2.0 (28.4)	2.0 (35.6)	6.0 (42.8)	9.0 (48.2)	13.0 (55.4)	13.0 (55.4)	13.0 (55.4)	13.0 (55.4)	10.0 (50.0)	6.0 (42.8)	3.0 (37.4)	-1.0 (30.2)	-2.0 (28.4)
Average precipitation mm (inches)	20 (0.8)	13 (0.5)	21 (0.8)	43 (1.7)	99 (3.9)	177 (7.0)	149 (5.9)	86 (3.4)	41 (1.6)	11 (0.4)	9 (0.4)	10 (0.4)	679 (26.8)
Mean monthly sunshine hours	279	252	341	360	403	390	341	310	330	341	300	310	3,957

Seismicity

The area falls in Low Hazard Seismic Zone with Seismic Factor Ground Acceleration of factor ≤ 0.03 showing Negligible Possible Damages. According to the building code of Pakistan, it is located in the seismic zone 2A of Pakistan. Zone 2A represents peak ground acceleration (PGA) from 0.08 to 0.16g.

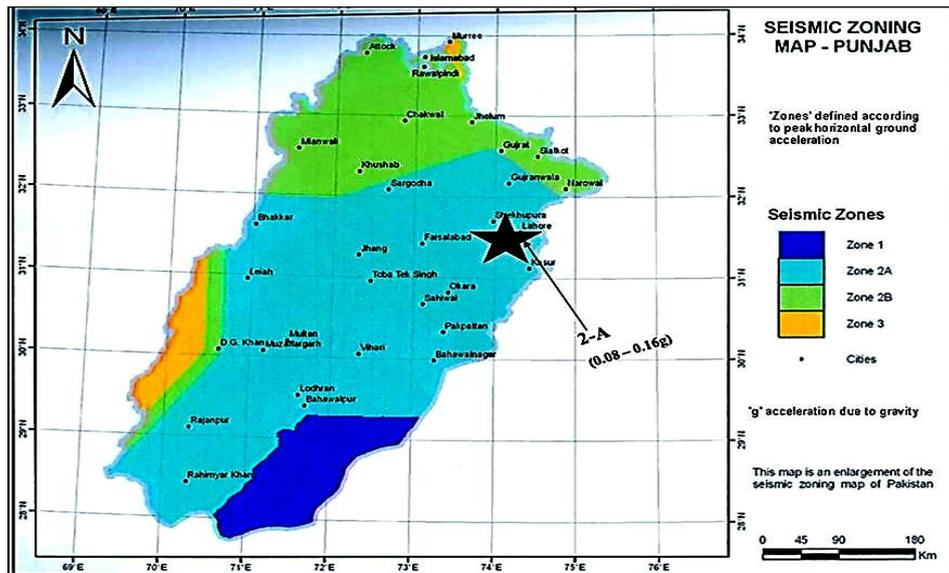


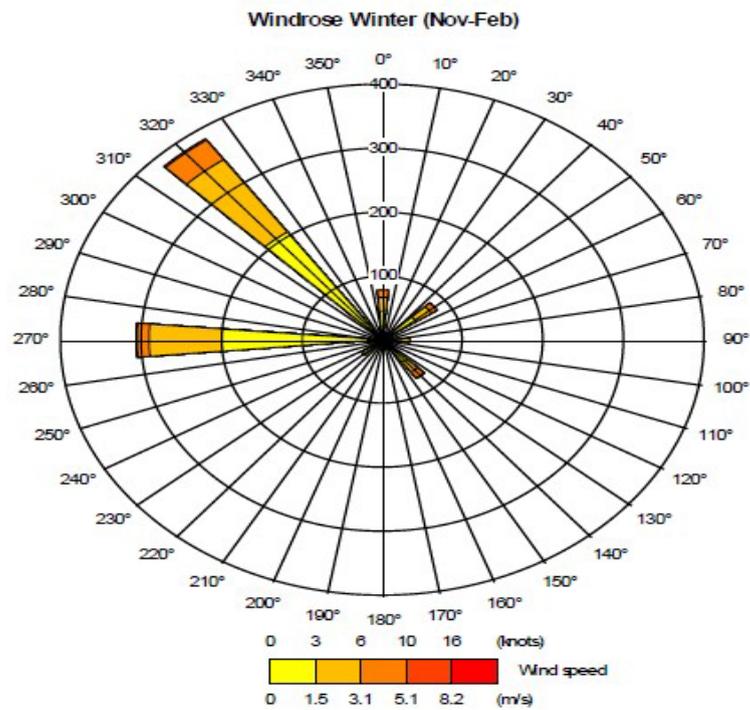
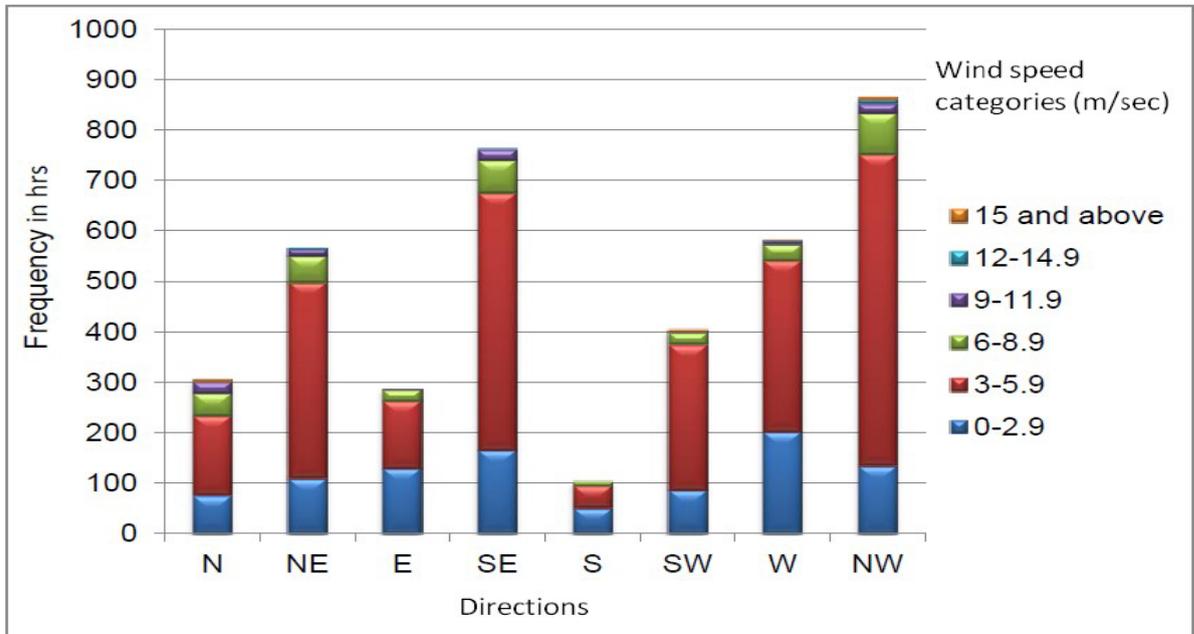
Figure 3.4: Seismic Zoning of Punjab

Water Resources

The study area forms the upper part of the Punjab plain, which is a part of Indo-Gangetic depression. The depression is of synclinal nature. Synclinal depression is a fore deep downward of the Himalayan foreland of variable depth, converted into flat plains by simple process of alluvial deposition. The aquifer underlying the study area comprises unconfined alluvium with a thickness of about 1050 feet as a part of regional ground water investigation.

Wind Direction and Wind Speed

Data about wind direction and wind speed for the year 2021, 2022, 2023, and 2024 is available on the format of average daily basis. While, on hourly basis it is available for the year 2020 Only. Below tables show the average wind speed and wind direction for the year 2021-2023.



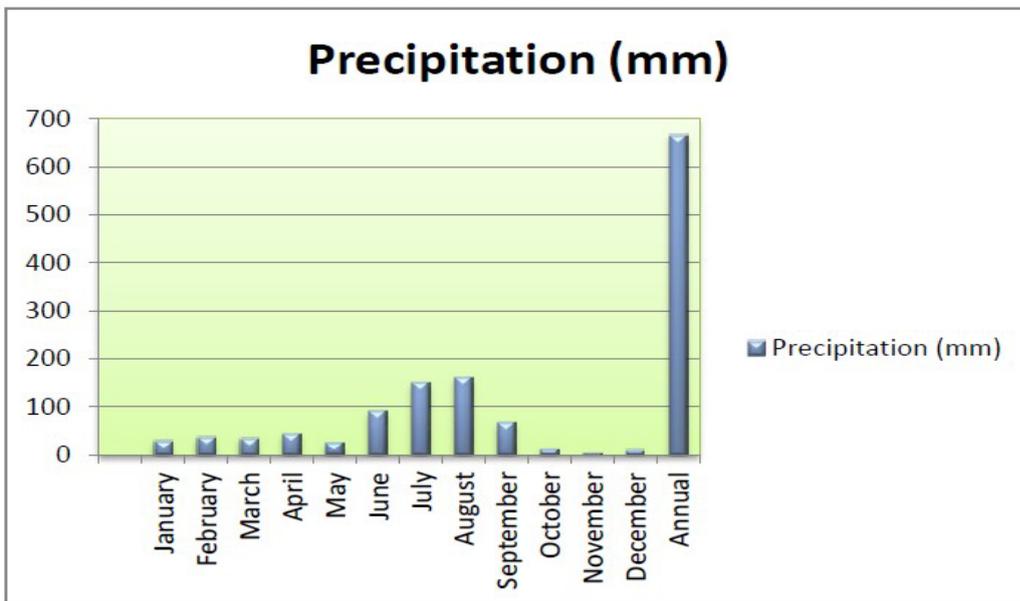
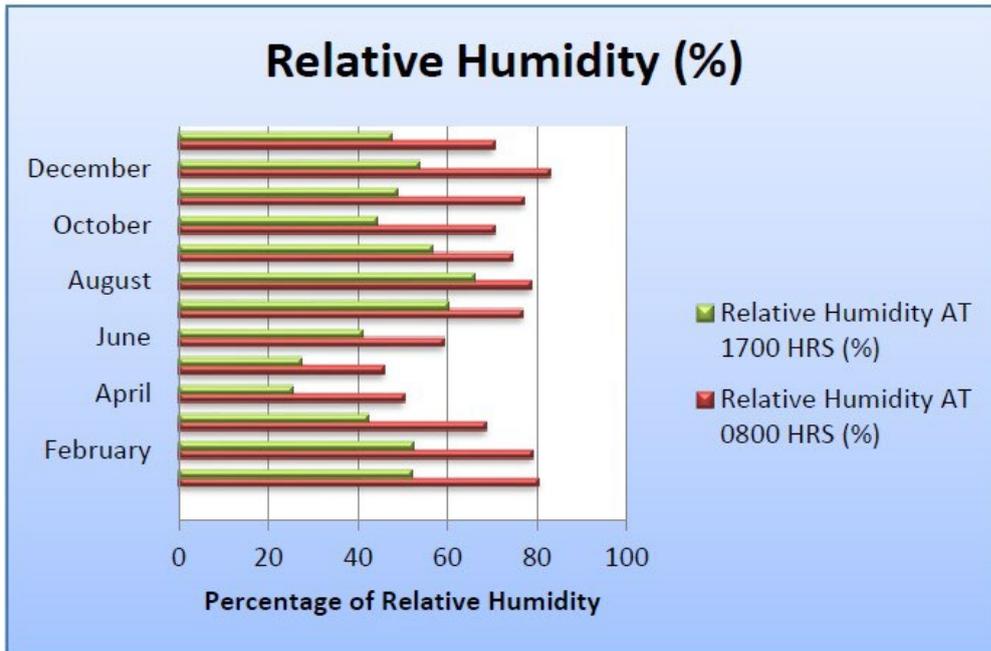
Humidity and Precipitation

The winter seasons lasts from November to March. December, January and February are the coldest months. The mean maximum and mean minimum temperature ranges from 19.8°C to 5.9°C in January. Temperatures in the Project Area vary from 5.9 °C to 40.4 °C.

The project area receives rains in all the seasons but monsoon rain is pronounced and constitutes a definite rainy season between the month of July and September. The average rainfall is about 629 millimeters per year. Below table summarizes month-wise temperature, precipitation, and relative humidity in the study area.

Month	Mean Temperature		Precipitation (mm)	Relative Humidity AT 0500 HRS (%)	Relative Humidity AT 2000 HRS (%)
	Maximum	Minimum			
January	19.8	5.9	28.92	80.4	51.9
February	22.0	8.9	37.14	79.0	52.4
March	27.1	14.0	34.3	68.6	42.2
April	33.9	19.6	44.32	50.2	25.3
May	38.6	23.7	24.38	45.7	27.2
June	40.4	27.3	91.62	59.1	40.9
July	36.1	26.8	150.52	76.7	60
August	35.0	26.4	161.42	78.8	65.9
September	35.0	24.4	67.28	74.4	56.4
October	32.9	18.2	11.74	70.6	44.2
November	27.4	11.6	4.44	77.1	48.8
December	21.6	6.8	9.94	82.9	53.73
Annual	30.8	17.8	666	70.34	47.4

Source: *Meteorology Department Lahore*



Ground Water

The previous studies and behavior of existing shallow and deep tube wells in the area have shown that in spite of local variation, aquifer overall behaves as a single homogeneous water body and 73% of the total consists of sand. The water table in the study area ranges from 70ft (surrounding areas) to 150 ft. in the centre of city. This condition is during the monsoon season, when the water table is high and the annual fluctuation is reported not more than 40 feet.

Before the introduction of controlled irrigation system in Punjab, the water table was deep towards the center of Doabs and was shallow along the rivers. After the introduction of controlled irrigation system in the region, water table started rising as a result of leakage/seepage from irrigation canals and infiltration from irrigation applications on crop fields. As a result, the area became water logged until about 1960 when a quasi equilibrium state was reached, controlled in part, by evapo-transpiration and drainage.

Recharge and Discharge of Groundwater

The main recharge source to the groundwater is from regional groundwater flow. Recharge to the area is also supplemented by leakage from canal system, seepage from the irrigated fields and infiltration from rainfall. The regional groundwater flow is the dominant component of recharge and assures the sustainability of the quantity and quality of groundwater. The main sources of discharge in the area are the evapo-transpiration and groundwater abstraction by the industrial and irrigation tube-wells.

For the project area, the ground water is the main source of water for meeting all kinds of requirements of units.. The quality of this supplied water has been tested through EPA-Punjab certified environmental laboratory. According to the data, all the parameters of water are within ranges as provided by Punjab Environmental Quality Standards. Results are attached with file submitted to EPA.

Flood Control

District has river Sutlaj and chance of flood remain in the district during monsoon. But the site where project will be constructed does not fall in the flood zone.

Ambient Air Quality

The main sources of air pollutants are gaseous emissions from the industries and traffic on road. Environmental Protection Department of Punjab has issued Punjab Environmental Quality Standards for criteria pollutants, i.e. Particulate Matter, Ozone, Oxides of Nitrogen, Sulphur Dioxide and Carbon Monoxide. For assessing the current status of these air pollutants in the study area, these pollutants have been monitored through EPA-Punjab approved laboratory. Results are attached with file submitted to EPA.

Noise

Area is in agricultural as well as in commercial use. Current levels of sound have been monitored. Noise levels are within PEQS. Reports are attached with file submitted to EPA for getting environmental approval. During the measurement following conditions were prevailed on workplace



NOISE LEVEL MONITORING:

Basic Environmental conditions:

During the measurement following conditions were prevailed on workplace:

Metrological Conditions:

During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed

Monitoring Instrument:

The description of the instrument used for the noise level monitoring is given below:

Name: Digital sound level meter

Model: AR824

Company: Intel Instruments plus

Frequency Range: 31.5 Hz to 8 kHz

Liquid Effluents

No water is required for operational activity. Water is required only for office use, kitchen use, hygiene purpose and workers use. Waste water after treatment is septic tanks will be disposed off in near by waste water disposal channel.

Solid waste

Every industry is responsible for management of its process/industrial waste. For management of municipal solid waste, color coded plastic bins have been placed in front of every industrial unit. Solid waste after collection will be segregated, transported and finally disposed off to land fill site or handed over to the contractor for final disposal. 3-5 kg solid waste will generate per day from operational activities comprising of paper, food items, plastic bags, tree leaves or packing material.

AMANAT PETROLEUM STORAGE

Baseline Ecological Environment

As climate of the area is semi-arid and subtropical, the vegetation of the area falls under scrub, dry, tropical thorn forest type as per phyto-geographical classification of the area.

Fauna

The project site is surrounded by urban and agricultural area. There is no wild life because of absence of conducive natural habitat.

Aquatic Fauna

There is no water reservoir lake, canal etc near to the project site hence no chance of damage to aquatic fauna of any kind. Otherwise, there is no fresh water body and fauna present in the project area.

Mammals

Commonly found mammals in the area include porcupine, stray dogs, cats, house rats, wild rats and bats. However Small Indian Mongoose and Indian Palm Squirrel are also found in the area. Common domestic animals include buffalos, cows, goats, sheep, camels and donkeys, horses, cats, dogs and hare.



Pigeon



Bank Myna



Parrot



Asian Koel



Figure 3.7: Fauna of the project area

Reptiles

Lizards such as Spiny tailed lizard (*Uromastyx hardwickii*) and fingered toed lizard (*Acanthodactylus cantoris*) are found in the area. Goh (iguana) and snakes are also found.

Amphibians

The amphibians found in the area include common frog (*Rana tigrina*) and Indus valley toad.

Birds

Doves, quails, House sparrow (*Passer domesticus*), House crow (*Corvus splendens*) and Mynah (*Acridotheres tristis*) are commonly found in the area. Along with these some of other birds were also found such as Nightingale (*Pycnonotus cafer*), Bank Myna (*Acridotheres ginginianus*), Parrot (*Psittacula krameri*), Pigeon (*Columba livia*), Common Koel (*Eudynamys scolopacea*) and Hoopoe (*Upupa epops*).

Critical Habitats

No wild life sanctuary or game reserve (critical habitats), exists near the project area or the study area and therefore it can be stated that, this project does not affect any critical habitat as no critical habitat is located close to the project area.

Forestry

The project area lies in the agricultural zone. No forest is found in area.

Flora

The vegetative resources around the location of the project are typical of the plains and include Kikar (*Acacia arbica*), Shisham (*Dalbergia sissoo*), Pipal (*Ficus religiosa*), Mulberry (*Morus alba*), Aam (*Mangifera indica*), Siris

(Albizzia lebbek), Jamolan (Engenia jambolana), Amaltas (Cassia fistula) and Saffaida trees. They are the most useful and provide hard wood for construction, agriculture implement manufacture and for a variety of many other purposes like furniture manufacturing. These trees are not present on the project site.

Wild grasses and horny shrubs are also found mostly as wild growth on especially small patches of land which is out of use. The flowering plants include Sun flower, Rose, Motiya (Jasminum sambac), Shoe flower (Hibiscus rosa). The trees include Alstonia, Arjun, Gul-e-Nishtar, Neem, Ashoke, Kanair, Sukh Chayn, Bottle brush.

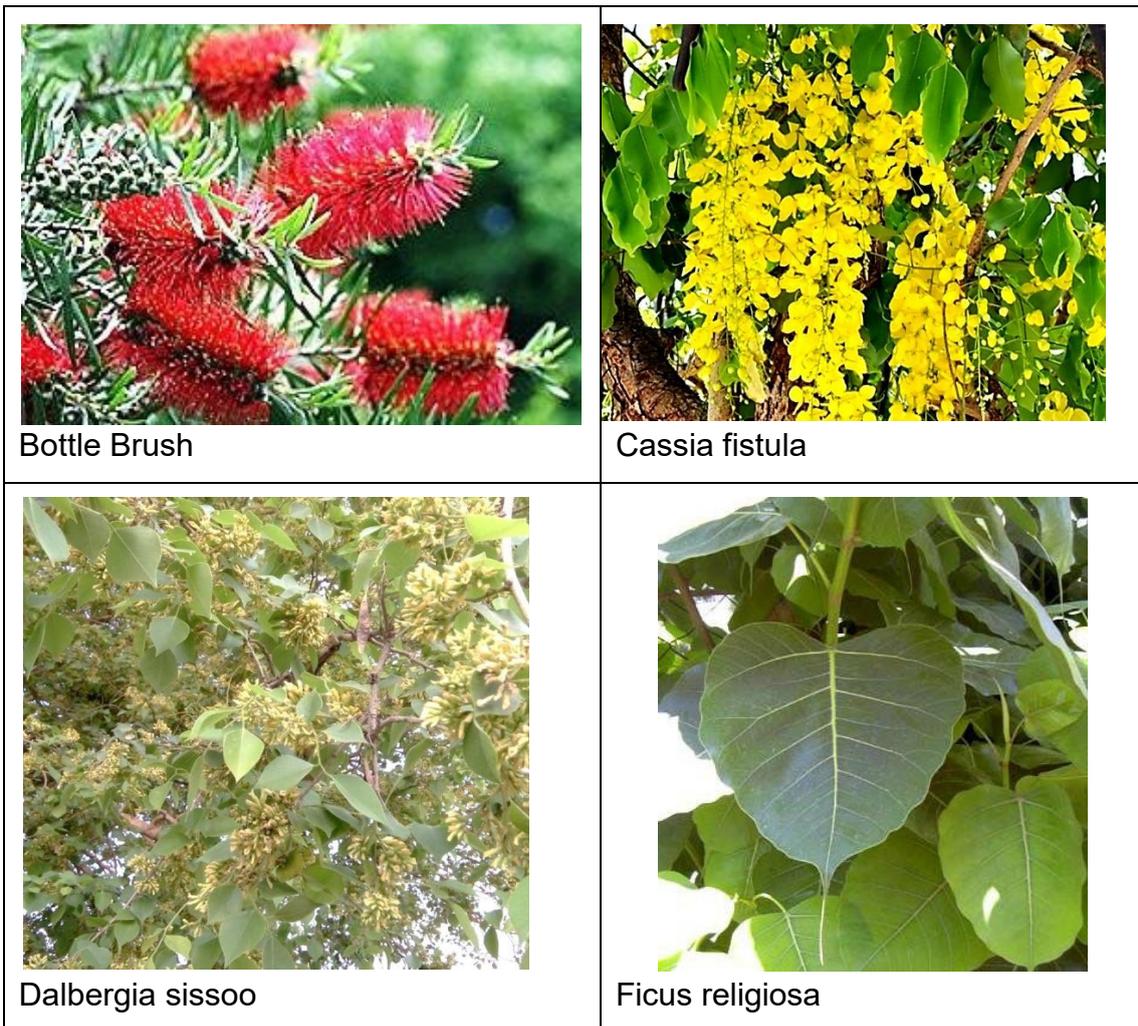




Figure 3.8: Flora of the project area

Endangered Species

There are no endangered species of plants or animals in the project area.

Agriculture

The surrounding area of the project is predominated with agricultural use. The wheat, rice, maize, berseem, brassica (Sarson), legumes and pulses and animal fodder are among the major crops grown on the agricultural land surrounding the project area.

Baseline Socioeconomic Environment

Socioeconomic baseline has been developed for the project through a review of secondary data as well as primary data collected using checklists and discussion with locals (residents, farmers, shopkeepers, students, pedestrians, drivers) in the project area. Social survey was conducted to assess the present socio-economic and socio-cultural conditions of local population of the project area. The availability of basic amenities of life to community living in the project area is indicator of its socio-economic condition. Secondary data used include census report and previous research carried out in the area.

Population and Communities

As of the 2023 census, Kasur district has 645,308 households and a population of 4,084,286. The district has a sex ratio of 104.53 males to 100 females and a literacy rate of 62.85%: 67.97% for males and 57.44% for females. 1,146,988 (28.10% of the surveyed population) are under 10 years of age. 1,243,882 (30.46%) live in urban areas.

Historical population		
Year	Pop.	±% p.a.
1951	760,304	—
1961	853,877	+1.17%
1972	1,186,386	+3.03%
1981	1,528,002	+2.85%
1998	2,375,875	+2.63%
2017	3,454,881	+1.99%
2023	4,084,286	+2.83%
POPULATION OF KASUR DISTRICT		

Political and Administrative Set-up

Khurshid Mahmud Kasuri born 18 June 1941), is a Pakistani politician and writer who served as the Minister of Foreign Affairs of Pakistan between November 2002 until November 2007. He is the Senior Advisor on Political and International Affairs and Chairman of the Pakistan Tehreek-e-Insaf's Task Force on Kashmir and a member of the Core Committee of the Party. He is also the author of 'Neither a Hawk Nor a Dove'. Malik Meeraj Khalid Speaker of National Assembly and Prime minister of Pakistan was also belongs to Kasur. Current speaker Punjab Assembly Malik Ahmad also belongs to Kasur.

Mohammad Asghar Khan (17 January 1921 – 5 January 2018) recognized as the Father of the Pakistan Air Force and known as Shaheen-e-Pakistan and Night Flyer, held the distinction of being the first native and second[e] Commander-in-Chief of the Pakistan Air Force (PAF) from 1957 to 1965. Additionally, he was the ninth president of the Pakistan Football Federation, an airline executive, politician, author, and golfer

Deputy Commissioner is the head of District Administration whose main function is to supervise the activities of the district administration which consists of Police Department and Civil Administration. There are many departments in the district administration such as Revenue Department, Police, Health, Education, Agriculture and other Departments.

Deputy Commissioner is direct head of the Revenue Department in the district. Deputy Commissioner is also the Chairperson of Education and Health Authorities in the district. Efficient and effective service delivery is the main responsibility of the district administration.

Industries

Kasur is the Pakistan's fifth largest centre of industrial production, after Karachi and Faisalabad. Kasur, along with the nearby industrial cities of Gujranwala and Lahore City, form what is sometimes referred to as the Golden Triangle in reference to their relative prosperity and export-oriented industrial base. The city's industries employ up to 500,000 people, while the city's GDP makes up 5% of Pakistan's overall economy.

An estimated 3000 small and medium enterprises, 10000 cottage units, and some large factories, are located in and around the city as of 2002 -and are engaged in the manufacture of a wide variety of goods. Industry Tannery setup, textile industry spinning weaving and dying. City is well known due to its The city is the centre for manufacture and export of textile products and home textile wares in Pakistan,.

Textiles, apparel, yarn, and other textile goods are also produced in Kasur. Other manufacturing based in the city include rice, plastic, , agricultural tools and equipment, carpets, glass goods, domestic appliances, motorcycles, and food products. The rural regions surrounding Kasur are heavily engaged in the production of wheat and are yield more wheat per acre than the national average. Kasur District is also the most productive region for rice-growing in Punjab. Niaz Nagar is also established industrial setup for the tannery cluster. Sapphire, Kohenoor, Style and other famous industrial set has already been established in the district. Phool Nagar industrial area Pattoki is the 7th dense industrial area of Pakistan, Chunian is famous for its sugar mills, Abdullah sugar mill is the largest sugar mill of Pakistan

Infrastructure

Road

District Kasur is connected to Lahore through Ferozpur Road. Depalpr Road and other roads infrastructure is also exists in the District which connect city with the tehsils.

Rail

Kasur Junction Railway Station is located in Pakistan. Before Partition Kasur was Big Junction with Lines to Firozpur & Amritsar. The Amritsar Patti Railway Company Limited was a Private Company incorporated on 12 April 1905. The 27 miles (43 km) broad gauge (BG) from Amritsar to Patti opened in 1906 and

worked by North Western Railway(NWR). In 1910 the line was extended to Kasur bringing the line length to 54 miles (86 km) & making Kasur a Big Junction station.

The Punjab Mail from BombayMumbai to Peshawar via Bhopal, Jhansi, Agra, Delhi, Bhatinda, Firozpur, Kasur, Lahore Junction used to run through Kasur Tehsil railway station. The Train is Still running in India from Bombay Mumbai to Firozpur.

Airport

Kasur has no airport of its own. The city is instead served by airports in nearby cities, including the Allama Iqbal International Airport in Lahore that offers non-stop flights to Europe, Canada, Central Asia, East Asia, and Southeast Asia. Gujranwala is also serviced by the nearby Sialkot International Airport – Pakistan's first privately owned commercial airport. Built-in 2007, the airport offers non-stop service to the Middle East, as well as domestic locations.

Public transportation

Kasur has a small scale centrally managed public transportation system known as a city tour. It has its routes from Lahore to Kasur mainly extended on Ferozpur road only. Other local buses and wagons also provide transportation service within and out of city.

Potable Water Supply

Said project will be established in the agricultural land and ground water will be used for drinking purpose. Turbines or tube wells will be installed for the drinking purpose,

Sanitation and Drainage

Waste water disposal channel is available in front of the said industrial setup for the disposal of waste water channel. Waste water after treatment in septic tanks will be disposed off in drain. Proponent has its own agricultural land around the project premises. Treated waste water will be dispose off in the proponent own land for watering trees and plants.

Land Use Planning

Under the present Government system, the District Government is responsible for all land use planning according to the provincial laws. Said unit will be established in accordance with the city district by Laws.

Power Sources and Transmission

WAPDA is the source of all electricity for the said unit. Electric supply is also available to all of the surrounding areas including.

Agricultural Development

Local residents earn their livelihoods from agriculture and livestock. However, with time, the areas are getting urbanized and converted into residential societies. The major crops include wheat, rice, fodder plants and some vegetables.

Quality of Life Values

Main Occupations

Survey of the project area reveals that agriculture is the main source of income for people of the area. Majority of the people around the project site belongs to poor section of the society. They are farmers, workers in different industries; some people have their own shops. A very small group belongs to affluent portion of the society including industrialists, bankers, politicians, educationists, medical professionals, businessmen and real estate business owners.

Family Life

The elders themselves strictly follow the old traditions in every walk of life while living in the affluent society. Their children are trying to follow the life style of the affluent society. In spite of all the modernized lifestyle, virtually elders are responsible to make decisions and their decisions are valued by the family members.

Print and electronic media are influencing almost all walks of life of the people. There is a lot of awareness about education. Rich or poor all families are trying hard to get their children educated. Mostly joint family system prevails. Most of the families are quite coherent. There is a rising trend in the society to change their old traditional socioeconomic pattern of life.

Religion

Predominant religion of the area is Islam with some percentage of Christian community. Wahabi sect can be found dominant compared with other sects. This is because of annual processions of Tableeghi Ijtimaa which have long been organized in the Raiwind area. People from all over the world attend this Ijtimaa. Locals also attend this Ijtimaa.

Religion in Kasur District

Religious group	1941		2017		2023	
	Pop.	%	Pop.	%	Pop.	%
Islam 🕌	368,590	60.00%	3,333,273	96.48%	3,939,584	96.52%
Sikhism 🕌	145,919	23.75%	—	—	53	~0%
Hinduism 🕉️	77,923	12.69%	243	0.01%	475	0.01%
Christianity ✝️	21,170	3.45%	119,801	3.47%	140,136	3.43%
Ahmadiyya 🕌	—	—	1,094	0.03%	803	0.02%
Others ^(b)	672	0.11%	470	0.01%	517	0.02%
Total Population	614,274	100%	3,454,881	100%	4,081,568	100%

Public Health

Sanitation facilities are very poor. Old naali system still exists. These overflow even in case of light rain. These cause muddy bumps on the roads. Drinking water supply is through bore hole pumps.

Only small scale dispensaries are available at some villages of the area. DHQ is the major health facility present at about 20 Km from the project area. THQ and many BHU health centers are available at village level. Many private hospitals are present within the city.

Education

BISE, Kasur" is a wing of Educational Department. It is an autonomous body. It provides services at Matric and Intermediate level. Gujranwala city's adult literacy rate in 2008 was 73%, which rose to 87% in the 15–24 age group throughout Kasur District, including rural areas.

Recreational Resources

Many recreational points are present in the district detail is given below.

Shrine Baba Bulley Shah



Syed Abdullah Shah Qadri, known popularly as Bulleh Shah and Bulleya, was a Punjabi philosopher and Sufi poet during 17th Century. His ancestors had migrated from Bukhara (modern-day Uzbekistan) in the 14th / 15th Century AD. His first spiritual teacher was Shah Inayat Qadiri, a Sufi murshid of Lahore. He was a mystic poet and is universally regarded as "The Father of Punjabi Enlightenment". He lived and was buried in Kasur. Shrine of Bulleh Shah is situated right in the center of Kasur City. His three-day annual Urs celebrations starts on 10 Bhadon (in the last week of August).

- Other places are given below.
- Balloki headworks
- Ganda Sing wala border
- Changa Manga Forest
- Sharice Baba Kamal Chistti

Aesthetic and Cultural Values

Because of limited income, most of the common people live marginalized status of life. They had completely rural standards of living. Gradually the people are getting urbanized. However, old traditional and simple life typical of the Punjab villages is the prevailing cultural and aesthetic characteristic of life style of majority of the people. Old people prefer to live conservative life style. Decades old culture and customs in every walks life are dominant. General attitude to visitors is quite welcoming.

Language

Punjabi is the main language. Many dialects of Punjabi can be found in practice.

Ethnicity

The main castes and groups of district are Arain, Kashmiri, Jutt, Rajput, Malik, Pathan, Mughal, Sheikh, Komboh, and Gujjar.

Role of Women

Women of the area are mostly illiterate. However, they do assist their male family members in all of their activities. We can find women milking the cattle, managing the livestock, working at crop fields, selling the fruits and such other activities to support earning livelihood.

Archeological and Historical Treasures

Kasur is a city rich in heritage and culture. If you're interested in exploring its fascinating past, there's no better place than the Kasur Museum. It is one of those historical museums exhibiting numerous antiquities. Preserving the district Kasur's cultural and historical heritage was the central vision behind establishing the Kasur Museum. The museum has an extensive collection of photographs, exhibitions, and artifacts excavated from each part of the city. Visitors can explore various aspects of Kasur's heritage through these exhibits. Kasur museum is one of the best museums in Pakistan.

The Kasur Museum in Pakistan is a great way to learn about the city's rich history and culture. Visitors can explore the exhibits at their own pace and better understand the city's heritage.

Lab Reports of Environmental Analysis

For assessing the current status of baseline quality of environmental parameters including ground water supply, ambient air and noise in the study area have been monitored through Punjab-EPA approved laboratory. The monitoring reports of Environmental Testing Laboratory containing the results have been attached with file.

According to the data, all the parameters of water are within ranges as provided by Punjab Environmental Quality Standards.

The main sources of air pollutants are gaseous emissions from the industries and traffic on road. Environmental Protection Department of Punjab has issued Punjab Environmental Quality Standards for criteria pollutants, i.e. Particulate Matter, Ozone, Oxides of Nitrogen, Sulphur Dioxide and Carbon Monoxide. Results have been described in Table 3.3. According to the data, all the parameters of air are within ranges as provided by Punjab Environmental Quality Standards. These may be subsequently monitored for knowing impact of project construction and operational activity on the value of these pollutants.

CHAPTER-4

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

General

This chapter identifies the potential impacts due to the implementation of project on the physical, ecological and social environment of project area. The chapter also identifies measures that will help mitigate the project's adverse environmental effects and enhance positive impacts. This shows the environmental responsibility on the part of the proponent.

The proponent is submitting an undertaking on stamp papers with EPA-Punjab that he shall ensure that the project shall be executed throughout all of its phases strictly in compliance with all applicable legal and regulatory obligations regarding environment. Therefore, we can say that the project activities shall not have significant negative environmental impact on any aspect of the environment.

Impact Assessment Methodology

The environmental aspects of the project during all stages namely pre-construction, construction and operation have been selected from master list of environmental items which is widely used world over for this purpose. The extent of qualitative and quantitative impacts has been described and mitigation measures have been proposed to keep them within permissible limits.

The systematic strategy developed to provide an assessment of the potential impacts on the environment of the project area included:

- Considering general guidelines
- Surveying, environmental baseline monitoring and public consultations to identify potential environmental impacts
- Situational analysis to know magnitude and significance of impacts
- Proposing best available and cost effective mitigation measures

Impacts Associated with Project Location

The project envisages the construction of Petroleum products filling and storage unit at District Kasur. The establishment of this unit is not expected to cause any significant negative impact in the location of the project because all the environmental aspects shall be kept under strict controls with the help of stringent mitigation measures.

Impacts Associated with Project Design

Design stage is the most important stage where environmental consideration can comfortably be incorporated without any financial and environmental damages. Subsequent modifications in order to bring the project in compliance with legal requirements after the initiation of the project often causes wastage of valuable natural and financial resources.

The building shall comprise a office block, filling shed, fire pump room, storage shed. The civil work will be excavation for foundations, erection of columns and rafters and masonry walls. This shall be followed by steel sheet ceiling of main building. The associated structures shall include office block, kitchen and guard room. The ceilings of office block and guard room shall be made of RCC supported by RCC pillars, beams and masonry walls. Localized drilling shall be done to excavate for foundations.

The project has been designed to adhere to all standard technical as well as environmental requirements in order to avoid impacts on environment. The design of the project shall be implemented only after approval by concerned department.

Impacts Associated with Construction Phase and their Mitigation Measures

The project shall be established in agricultural cum commercial site. All the steps of construction shall be performed according to bye-laws. Therefore the impact of construction shall be controlled.

Noise and Vibration

During construction activities, continuous, intermittent and instant noise and vibration may be caused by the operation of earth moving and excavation equipment, welding plant, cutting operations, concrete mixers, cranes and lifters for the transportation of equipment, materials and people. Loading and off-loading of materials and equipment shall also be a source of noise.

The noise levels shall be mostly within acceptable limits. Moreover, residential areas are very far away from the project site. Thus these shall not be impacted due to noise and vibration.

Duration:

On the whole, the duration of the noise shall be temporary. The construction activities shall be performed only during day light hours.

Mitigation Measures

- Activities with the greatest potential to generate noise to be planned during periods of the day that will result in least disturbance.
- Such equipment shall be used which has been designed by default

with noise control elements.

- Using noise control devices, such as temporary noise barriers and exhaust muffling devices for combustion engines.
- Proper lubrication and maintenance of all construction equipment shall prevent unwanted sounds leading to noise.
- Operation of noise producing machinery shall be kept limited.
- Ear plugs shall be provided to workers during construction.

Impact on Soil

Initially the soil shall be disintegrated to a little extent due to excavation for foundation pillars. Soil disintegration may also be caused by exposure of soil surfaces to rain and wind during site clearing, earth moving, and excavation activities. The mobilization and transport of soil may result in sedimentation of surface drainage networks.

Duration:

Temporary.

Mitigation Measures

- Excavation shall be done for foundation with the help of vertical drilling thus restricting its area of impact only to the specified points of the site
- Compacting the surfaces properly
- Preventing the movement of soil particles into the water lines
- Vegetating exposed areas after construction promptly

Impact on Air Quality

Initially construction activities may generate emission of dust caused by a combination of on-site excavation, ground leveling, filling, movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary source of emissions may include exhaust from combustion engines of earth moving equipment on-site.

Use of uncovered vehicles for transportation of building materials such as gravel, sand and cement as well as their storage on the construction site can lead to inadvertent dispersal of materials during heavy rains or high winds during dry periods. This may have a little negative impact on the surroundings the form of particulate matter (PM). The principal air pollutants may be particulate matter (PM), CO₂, CO, NO_x, SO_x, and to a little extent VOC's.

Duration:

Temporary.

Mitigation Measures

- Restricting the excavation only to the specified points with the help of drilling excavator

- Covering the stockpiles of construction materials and/or watering where possible
- Minimizing dust from open area sources, including storage piles by installing enclosures.
- Covering all haul-trucks carrying earth, sand, aggregate and other materials with tarpaulin to help contain construction materials being transported within the body of each carrier.
- All contracted vehicles shall be ensured to remain tuned and maintained so that unburnt hydrocarbons may not be released into the environment in the form of VOC's.
- Use of such construction equipment and vehicles which uses environment friendly fuels
- Daily sweeping of all the surroundings where possible.
- Painting should preferably be executed with brush. Environment friendly paints should be used.
- Good housekeeping should be observed at the site generally.
- Provision of PPE's to workers to prevent entry of air pollutants in their breathing system.

Solid Waste

Solid waste expected to be generated from construction activities may include broken bricks, left over of sand and cement, excess fill materials, concrete waste, sanitary wares, electricity wires, wooden cuttings, scrap metals, cement packaging, empty cartons/containers, glass waste etc. Municipal solid waste will also be generated due to worker's activities. Overall the solid waste shall be combination of biodegradable and non-biodegradable kinds.

Duration:

Temporary.

Mitigation Measures

- Waste management hierarchy of reduce, reuse and recycle shall be ensured for all of the construction activities.
- A comprehensive solid waste management plan will be devised and adhered to collect, segregate and dispose solid waste.
- Recyclable and non-recyclable waste will be segregated, stored separately at source.
- Segregated recyclable waste will be sold to contractors in recycling market and the non-recyclable construction debris waste will be sold to contractors who usually dump the construction waste debris in pits.
- Solid waste shall be kept covered especially during rainy season.
- No on-site burning of wastes will be allowed at any time.
- All employees shall be trained regarding proper waste management
- Collection schedule of waste will be according to the rate of generation
- Management of municipal solid waste shall also be according to solid waste management hierarchy of reduce, reuse and recycle. It will be properly disposed-off to prevent the chances of its attraction by

scavengers. On the site, the color coded bins for collection of municipal solid waste shall be available.

Impact on Water Resources

There are no surface water resources which are expected to be impacted by the project activities. The construction activity shall use only a small amount of water for making concrete mix for foundations and pavement of the floors. For this purpose, ready mix concrete shall be used. Therefore water shall not be collected from the site for their preparation. Rest all shall be erection and installation of steel structures.

Construction activities may cause the generation of sanitary wastewater discharges in varying quantities depending on the number of workers involved. This waste water after treatment in septic tanks will be disposed off to the nearby waste water disposal channel.

Duration:

Temporary/Short term

Mitigation Measures

- All kinds of wastewater shall be segregated.
- Water usage shall be kept as minimum as possible.
- Water reuse and recycling shall be ensured where possible.
- Storm water can be stored for use during construction as such or after minimal treatment such as screening and settling. Use of such storm water may include watering of bricks, open sand piles, built structures.
- Excess of storm water can be allowed to percolate through exposed soil to recharge water table.
- Efforts shall be made to prevent entry of solid waste into the water.
- Adequate sanitation facilities serving all construction workers shall be provided.
- Sewage from construction camps should be disposed of by development of on-site sanitation systems i.e. septic tanks.
- The contractors need to ensure that their machinery and equipment is properly tuned and serviced and there is no leakage or spillage of oil or oily products from the construction equipment and machinery which may pollute ground water.

Impact on Ecological Environment

The construction activity will be carried out in the proposed site and does not have significant flora and fauna. Therefore, no adverse impact on fauna and flora is anticipated due to the proposed activity. There will be no cutting of any trees. There will be removal of grass and weeds from the location of proposed plant site. Temporarily the green belt can receive particulate pollution due to construction activity if preventive measures not taken.

Mitigation Measures

- The construction activities should be performed in such a manner that it does not impact vegetation of green belt of the project area.
- Tree plantation shall be carried out after construction to improve the ecological condition.

Impact on Socio-economic Conditions

The implementation of the proposed project will not involve dislocation or involuntary resettlement of people. Positive impact is anticipated in terms of employment opportunity as many skilled, semi-skilled and un-skilled personnel will get direct and indirect employment during construction phase. Construction activities, particularly movement of haul trucks and machinery may affect the workers as well as the residents.

Mitigation Measures

- This should be ensured that local people be preferred for all kinds of jobs during construction phase.
- The Contractor will select specific timings for heavy machinery operation so as to cause least disturbance to the adjoining community by considering their peak movement hours.

Occupational Health and Safety

To install the pre-engineered building structure of steel shed, work at height shall be involved which shall need safety management. A large portion of the work shall involve cutting, grinding and welding of metal parts. Moving machinery shall also have potential of injuries to the workers. Plus, there may also be electric hazards.

Handling of construction materials usually causes skin problems. Due to interaction of people from different backgrounds and health conditions, allergies may be caused if precautions not taken.

The steel shed shall be painted after installation. This activity poses hazards to painting crew.

The construction activity will be performed only 08 hours a day and additional time for lunch break. Thus there are less chances of night fatigue.

During hot season of the summer, there may be chances of heat stress.

Mitigation Measures

- Adequate scaffolding and shuttering should be established and used for all kinds of construction activities.
- Work at height should be performed only after permit to work by HSE

staff who shall issue such permit to work at height after taking all appropriate measures.

- Work site layout shall be designed to minimize the need for manual transfer of heavy loads.
- Electrical cords should be located in common areas and marked corridors.
- Safety signage should be adequately displayed
- Clean drinking water availability should be ensured for use by all construction staff.
- In order to prevent spread of infectious diseases, only the workers tested for harmful infectious diseases should be hired. Screening test may be performed at the time of hiring
- Emergency response plan should be made, communicated to all and maintained during all of the construction activities
- First aid facility should be readily available for the workers at the site.
- Good house-keeping should be practiced prevent the events of slips, trips and fall.
- Mandatory personal protective equipment like harness, masks, gloves and helmets should be strictly used by the labor according to their assignments at the work site.
- Smoking should be avoided to prevent any fire incident
- Fire and any other emergency shall be managed with the help of emergency services. Proper fire safety arrangements will be provided at site. Installation of fire hydrant, smoke detectors, fire alarm, safety sign, emergency exits, trained staff from rescue 1122.
- Adequate training and awareness about occupational and safety shall be provided to all of the employees.
- During hot season, outdoor work timing may be changed. Only indoor construction activities may be performed during sunny part of the day. In case of inevitable circumstances, workers should be given adequate breaks.
- Workers should be given mineralized fluids during hot season to balance electrolytes in their body.
- Painting activity should be performed with all occupational health and safety precautions for the workers.

Traffic Flow

The project plot is situated at agricultural cum commercial site and linked with main and linked roads. The transportation of construction materials through Road shall temporarily cause increased load on the road which already remains congested due to goods transport vehicles.

Mitigation Measures

- Transportation of construction materials shall be scheduled during off-peak hours so far as possible.
- Vehicle operators should be instructed to maintain low speed to prevent any accidents.

Impacts Associated with Operation Phase and their Mitigation Measures

Air Emissions

The sources of air emissions shall include vehicle movement, generator only. The movement of vehicles can cause exhaust emissions in the areas of loading and off-loading of raw materials and final products.

Mitigation Measures

- Mechanically Fit vehicles will be allowed for the transportation of Petroleum products Generator of good quality will be installed with less emission. Good quality fuel will be used and generators will be tuned and kept in proper working condition for less emission generation.
- A large portion of the plot shall be kept open. Vegetation/Tree plantation shall be done to improve air quality.
- Workers shall be provided with masks to prevent entry of particulates including fiber dust, coal dust and other particulates into their breathing system.

Wastewater & Water Balance

There is no water usage is operational activity. As operation of the project is storage and filling of Petroleum products. Water shall be needed for hygiene purposes in toilets or for irrigation of lawns. The source of water for meeting all needs of water for the unit shall be ground water through bore and motors. The sewerage shall be generated from toilets. Such waste water is not part of regular operations and may not have very hazardous composition. Overall requirement shall be 200-250 gallons per day.

Mitigation Measures

- So far as possible, the process water shall be circulated again and again to conserve amount of water and particles contained by it.
- Solid contents of water shall be screened at source in order to decrease pollution load of effluent water.
- Septic tanks will be constructed for the treatment of wastewater before ultimate disposal to keep its environmental quality parameters within PEQS.

Noise

The sources of occupational noise shall be the operations of all kinds of operational machinery and electric generator. This noise from project operation will be negligible and shall be controlled through following measures to keep it well below Punjab Environmental Quality Standards.

Mitigation Measures

- Machines shall have built-in containment and isolation to reduce noise.
- Guarding of the moving parts also shall reduce the noise.
- Machinery shall be arranged such that the generated noise shall be absorbed by the surrounding structures instead of reflecting it.
- Steel shed shall be equipped with fiber glass wool sheet. This has acoustic properties to absorb noise from inside and outside sources.
- Regular maintenance of equipment including lubricating moving parts, tightening loose parts and replacing worn out components should be conducted regularly to further reduce the noise generation.
- Equipment will be regularly inspected for good working condition.
- Plantation of trees along perimeter of the building shall reduce impact of noise from outside sources reasonably.
- Due to automation, workers shall be usually away from the sources of noise.
- Latest electric generator shall be used which shall be equipped with silencer.
- Workers shall be provided with ear plugs.

Solid Waste

Project activity will not generate any solid waste. However source of solid waste may be kitchen , office papers, Empty sacks/bags, wrappers and containers and discarded packing of goods may also be source of solid waste.. The generation rate of this waste shall be 2-5 Kg/day.

Mitigation Measures

- Recyclable and non-recyclable waste will be segregated and stored at source.
- Segregated waste will be sold to such outsourced waste managers who shall be responsible to manage all kinds of the solid waste in an environment friendly manner. Recyclables shall be sold to recycling industry by these waste managers.
- Overall, waste management hierarchy of reduce, reuse and recycle for all of the operations shall be ensured.
- A comprehensive solid waste management plan will be devised and adhered to collect, segregate and dispose solid waste.
- No on-site burning of wastes will be allowed at any time.
- Training of all employees regarding proper waste management
- Collection schedule of waste will be according to the rate of generation.

Impact on Flora and Fauna

Said project will be established in agricultural cum commercial land. There is no sensitive flora and fauna. No fresh water body adjacent to the project site hence impact of project activity on flora and fauna is negligible.

Mitigation Measures

- Ornamental plants and fruit trees have been proposed to be planted on very large sized lawns inside the plot to improve aesthetic beauty, landscape and create a suitable habitat for fauna.
- As part of EPA-Punjab requirement, 1000 trees shall be planted in side and outside the project premises.

Occupational Health and Safety

Said project is Petroleum products storage and filling unit. Workers may injured during loading and unloading of cylinders, filling of cylinders or from any project activity. PETROLEUM PRODUCTS leakage and fire are the majors hazardous of the project. Minor and major injuries may affect workers health.

Mitigation Measures

- Contractor will be responsible for the provision of Personal Protective Equipments (Goggles, Masks, Safety shoes and Safety Helmet, Ear Plug and Ear Muff etc) to workers.
- Excessive tree plantation in and around the project premises.
- Construction of hall around the generator if any along with installation of silencers to reduce noise
- Installation of fire safety equipment (DCP Cylinders, AFFF, Water based cylinder, Installation of fire alarm system, smoke detector, safety signs). Installation of water hydrant system along with bulk storage of AFFF for fire fighting.
- Cemented floor will be provided where raw material will be stored to avoid contamination in case of leakage from compressors. Oil and greases if any will be collected and stored in a cemented/ concrete tanks to avoid any chance of spillage/ leakage.
- Workers will be provided fire fighting skills in collaboration with civil defense, Rescue 1122 so that in case of any fire emergency an effective response must be ensured.
- No smoking is allowed within the area of project premises.
- No cooking activities within the project premises.
- Proper safety signs will be installed to create awareness about product, its nature.
- Emergency response plan shall be made, communicated to all and maintained during all of the operations activities.
- First aid facility shall be readily available for the workers.
- Good house-keeping shall be practiced to prevent slips, trips and fall.
- Regular inspection of tanks/ vessels and Petroleum products distribution system is recommended. Pressure test of all vessels, tanks is also recommended after specific period of time.

Impact on Socio-economic Conditions

A positive impact is anticipated in terms of employment opportunity as many
AMANAT PETROLEUM STORAGE

skilled, semi-skilled and un-skilled personnel will get direct and indirect employment during operational phase of the proposed project.

Mitigation Measures

In order to enhance the socioeconomic benefits of the project, local people should be preferably hired for all of the operational activities so that they feel ownership of the project.

Traffic Flow

The project plot is situated within agricultural cum commercial land. Road shall temporarily cause increased load on the road which already remains congested due to goods transport vehicles.

Mitigation Measures

- Transportation of raw materials shall be scheduled during off-peak hours so far as possible.
- Vehicle operators should be instructed to maintain low speed to prevent any accidents.

Potential Environmental Enhancement Measures

Following steps shall be taken for environmental enhancement:

- Daily sweeping and dusting/cleaning shall be ensured.
- Vacuum cleaning shall be done daily where required.
- The perimeter and lawns of the plot shall be vegetated with flowering plants and fruit trees for environmental enhancement.
- Additionally the proponent shall also plant 1000 trees inside and outside of project are recommended..
- There shall be separate drainage for sewerage and rain water.
- Adequate fire fighting system will be established and maintained at all times according to PIEDMC bye-laws.
- Visual impact of the unit and its surroundings shall be given due consideration.

CHAPTER-5

ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PROGRAM

5 ENVIRONMENTAL MANAGEMENT PLAN AND MONITORING PROGRAM

General

This chapter describes the Environmental Management Plan (EMP) for the environmental and social mitigation measures identified during the EIA and reported in Chapter 4 of this document. The Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmental sustainable manner where all contractors and subcontractors, including consultants, understand the potential environmental risks arising from the proposed project and take appropriate actions to properly manage that risk. EMP also ensures the project implementation is carried out in accordance with the design by taking appropriate mitigative actions to reduce adverse environmental impacts during its life cycle. Existing environmental regulations are complied with and potential adverse environmental impacts resulting from the project activities are minimized as practicably as possible.

The plan outlines existing and potential problems that may adversely impact the environment and recommends corrective measures where required. Also, the plan outlines roles and responsibility of the key personnel and contractors who are charged with the responsibility to manage the project site. This EMP provides the delivery mechanism to address the adverse environmental impacts of the proposed project during its execution, to enhance project benefits and to introduce standards of good practices to be adopted for all project works.

Environmental monitoring and management have been proposed to be carried out in all stages of the project namely; pre-construction, construction and operational phases. EMP will be operational to ensure legal environmental compliance. Environmental Monitoring by a third party will further ensure operation in environmentally sustainable fashion. The proponent will ensure that the implementation of all phases of the project is in line with the EIA report and Environmental Management Plan.

Objectives of EMP

For the effective implementation and management of the mitigation measures Environmental Management Plan (EMP) has been prepared to ensure compliance with the basic provisions of the Punjab Environmental Protection Act (Amendment) 2012. A structure of EMP is being given for the assistance of the management of M/S Amanat Petroleum Storage. It is recommended that project management must implement this EMP and where required, changes must be made accordingly. The key objectives of the EMP are summarized below:

- Define roles and responsibilities for the Project proponent, contractors and construction supervision consultants for implementation.

- Mention standards which need to be achieved. All relevant legislation is complied with prescribed procedures/standards.
- All environmental safeguards are carried out correctly.
- Provide mechanism for unanticipated environmental situation.
- Identify training requirements at various levels.
- The EMP provides a delivery mechanism to address potential impacts of project activities.
- Adverse impacts on environment are minimized.
- The project is monitored for environmental impacts.

Components of EMP

The EMP of the identified environmental impacts associated with this project consists of the following components:

- Description of the activities that are to be carried during all phases of project.
- Description of aspects which are likely to be impacted due to proposed project.
- Mitigation plan to reduce the severity of associated impacts
- Institutional arrangement and framework for monitoring, reporting and supervision of EMP
- Specific requirements for communication, documentation, training, management and implementation of the mitigation measures
- Monitoring the implementation of the EMP
- Monitoring plan to monitor the impacts and their severity
- Actions required assessing the effectiveness of the mitigation measures employed such as guide through the monitoring mechanism and identifying related parameters that will be required for confirming the effective implementation of the mitigation measures
- Environmental and social trainings to raise awareness
- Allocation of resources required to implement the EMP and outline relevant expenses arrangements.

Institutional Capacity/Roles & Responsibilities

Environmental management will be the integral part of the project policy. Therefore, committing to reduce the environmental impacts will reflect the management approach and believe that good performance in this area is identical with running a well managed efficient project operations.

Environmental management is basically the institutional arrangement which delegates some specific assigned responsibilities and those responsibilities are to be monitored properly. During operation phase, main responsibility for environmental performance will be supervised by top management of Vital Tower apartment building, while the daily management will be performed under the direction of Manager Operations and Administrator. Under their supervision, environmental management during operations will be performed

as per the mitigation and monitoring plans outlined in this IEE. A brief structure of role and responsibilities is given below:

Top Management

Project proponent will be responsible for monitoring and evaluation. He shall be able to do so with consultation of his Environment Consultant who will be responsible to monitor EMP implementation and reporting to the proponent. The Environment Specialist of consultant will carry out a final evaluation at the end of the project construction. Management will undertake overall responsibility for compliance with the EMP. It will ensure that all activities management executes with contractors, comply with positive environmental sensitivities as well as it will cooperate with the concerned regulatory agencies such as the Environmental Protection Agency-Punjab.

For effective environmental management, responsibilities shall be set internally as follows:

Chief Executive Officer

- To cooperate and consult with relevant environmental agency in order to perform in better way.
- Over all in-charge of all the Environmental Management Plan (EMP) and EMtP.
- He will be responsible to ensure smooth functioning of the EMP and EMtP system.
- To evaluate the progress of development and implementation of this management plan.
- Daily progress on the state of the environmental performance will be reported to him by General Manager.
- All Environmental Management and Monitoring matters, issues and problems will be reported to him.
- To approve any change in decision making with the consultation of respective managers, if appropriate.

General Manager

- He will be responsible to look into smooth functioning of the processes in environmentally sustainable fashion.
- He will directly report and will be answerable to the higher management in all matters relating to EMP.
- He will be responsible to rectify any problem regarding environmental matters.
- He will be responsible to get all environmental monitoring carried out according to the monitoring scheduled and will keep records

Contractor

The contractor will carry out field activities as part of the proposed project that includes relevant and subsidiary construction work. The contractor will be subjected to certain liabilities under the environmental laws of the country which will be mentioned in the contract with the project site. On behalf of contractor, top management will be responsible for all issues pertaining to environment of the assigned contractor. The delegated roles and responsibilities of the contractor will consist of the following basic points:

- To carry out construction activities in environmentally sound manner.
- To coordinate with the HSE Officer to resolve issues arise during construction phase.
- To manage and implement environmental management practices as per the impact assessment report as well as HSE polices belong to both contractor and project site.
- To manage construction crew and reduce the environmental impacts.

Manager Operations

The role of these managers will be crucial during the operation phase as all of the key environmental aspects listed fall into their respective domains. Following are some of the common roles and responsibilities given to these positions:

- To ensure that the points of views of staff, are considered and placed in the EMP accordingly
- To regularly meet and resolve the upcoming and on-going environmental issues.
- To identify issues and where possible propose solutions for inclusion in the management plan review process.
- To make sure that relevant staff is adequately trained to carry out their respective duties in order to improve environmental performance of the restaurant operations.
- To contribute towards the actions to deliver the management plan and ensure its continued development.

Construction Manager

The role of Construction Manager is very important. The success of an EMP will mainly depend upon effective management of the EMP by this person. During the construction phase, main responsibility of environmental performance will reside with proponent's construction manager, who will be assisted in daily activities monitoring by site HSE Officer. Following are some of the roles and responsibilities given to the Construction Manager.

- To ensure that the staff, contractors and HSE Officer's point of views are considered and placed in the EMP accordingly.

- To identify issues and where possible propose solutions for inclusion in the management plan review process.
- To improve coordination and exchange of information between management, employees, contractors, etc.
- To contribute towards the actions to deliver the management plan and ensure its continued development.
- To monitor the progress of development and implementation of this management plan.

Role of EPA-Punjab

District Office of the EPA-Punjab will monitor the overall environmental performance.

Monitoring Program to Assess Performance

Environmental monitoring of M/S Amanat Petroleum Storage will be carried out according to schedule as given in Table 5.3 and be reported to the EPA-Punjab. Monitoring of all the activities will be required to analyze the impacts of construction and operation phases on the environment. After start-up, a comprehensive monitoring for all PEQS parameters for normal operations will be carried out. This is to establish that the project does meet the environmental commitments made in this I EIA Report. This monitoring will be carried out by a third party. For external monitoring, proponent shall engage an independent agency to conduct third party validation of EMP implementation. Thereafter, subsequent regular monitoring will be restricted to priority parameters. All monitoring data shall be reviewed and analyzed regularly in comparison with the PEQS limiting values. In case of any deviation, immediate necessary corrective actions should be taken.

5.5.1 Responsibilities for Monitoring

HSE officer will coordinate with construction manager and contractor site representative to monitor environmental parameters during the construction phase.

During operations, the Manager Operations will follow the monitoring plan as mentioned in Table 5.3. They will keep record of all environmental non-compliances and report them along with the corrective actions in regular quarterly meetings with the top management.

Reporting and Reviewing Procedures

Monitoring schedule will be adhered to and all the data to be monitored will be scrutinized at the level of General Manager and on regular basis at the Chief Executive Officer level. For presentation of the data to the Government Agencies, approved data recording format will be followed. Some of the approaches to be followed during the environmental management practices are given below:

- Complying with the relevant legislation and regulations
- Regularly reviewing of the impacts on the environment.
- Developing appropriate indicators in order to monitor core impacts.
- Setting appropriate annual objective, targets and publicly reporting on progress.
- Communicating openly with internal and external stakeholders on environmental issues.

Training Schedule

This is another major step for the implementation of EMP. All the employees will require training appropriately to work on EMP effectively. There are lots of advantages of training; it can be helpful in minimizing the waste generation, conserve resources such as water and natural gas etc. General Manager shall be responsible to determine the training requirements in consultation with project workers.

To enhance the capacity of the proponent as well as the contractor, training will be imparted related to the environmental and social issues of the project, implementation of mitigation measures and the monitoring protocols and reporting mechanism. The training during construction will be conducted by PMU of the project. PMU will ensure in-house training for the project staff i.e. labor, masons etc., contractor, and the supervisory staff covering environmental and social aspects of the project with emphasis on the roles and responsibilities of the proponent and the contractor's staff. This shall be done just after recruitment of staff and also just before commencement of the construction activities. Subsequently, the proponent shall ensure that all the recruited staff receives basic training as well as recurrent training for his operational role as well as his role and responsibility regarding environmental management at the unit. Basic training shall be imparted just after recruitment of every staff and subsequently recurrent training shall be imparted annually.

Training Syllabus Contents

The training will include the following aspects:

- Identification of all environmental aspects of construction and operation.
- Likely impacts on these aspects of the environment.
- Measures to be adopted for avoiding or minimizing impacts on these aspects of the environment.
- Measures to be adopted for avoiding or minimizing water pollution, air pollution and safe waste disposal practices.
- Defining roles, responsibilities and authorities of every one for environmental management plan during construction and operations.
- Permissible limits for all environmental aspects according to Punjab Environmental Quality standards.

- Safety measures against hazards for workforce and the local communities arising from the construction and operation activities.
- Occupational health and safety aspects, use of personal protective equipment by the workforce during construction and operations.
- Emergency preparedness and response.
- Fire safety and management.
- Fire drill shall be performed every year during operations to aware the employees about their roles, responsibilities and authorities. This shall also help maintenance of the equipment installed for fire management.
- Safe work practices to ensure safe culture.

Environmental Management Plan

The preparation of this plan has involved an extensive and detailed program of investigation to the processes involved and with consultation of project's management and the issues concerned. Therefore, this network will provide a structure to assist in the implementation of the management plan accordingly.

The success of the management plan will lie with its implementation. An EMP requires to be executed in three stages. Those are, planning & design stage, construction stage and operation stage.

Pre-Construction Phase EMP

There are three main components to consider in EMP, prior the construction phase. Implementation of EMP at this stage may tackle the environmental issues before they arise. Those components are given below:

Design Stage

It describes the location of proposed project, its adjoining conditions in the area, facilities to be installed in particular locations as well as their mechanics and other related operations. If any design parameter changes at time of approval, management will assess the environmental impacts that may arise from such changes. If the impacts are found to be different and in excess of those mentioned in the report, project management will develop further mitigation measures with respect to the changes to minimize these impacts and seek approval for the required change from Environmental Protection Agency-Punjab as well as other regulatory authorities, if comes under.

Approvals

The proponent is bound to get all relevant clearances and necessary approvals required by the government prior to commencing the project activities regarding Petroleum Products storage and filling unit. Hence No objection certificate from the Environmental Protection Agency-Punjab will not relieve the project management and they have to fulfil the other requirements as well for starting their project.

Contractual Provisions

The requirements of environmental impact assessment in terms of environmental mitigation shall be incorporated into the operations plans and procedures of the contract. Therefore, signing of contract will strictly bind contractor to follow those procedures and must comply the environmental regulations.

Construction Phase

During the construction phase, the management of M/S Amanat Petroleum Storage will assign an HSE Officer, whose role will be to implement all environmental related issues as per the mitigation matrix in the EIA.

Operations Phase

During normal operations of the project, the proponent will assign all specific environmental related actions to respective departments who will be fulfilling their responsibilities as per the mitigation and monitoring matrices.

Mitigation Plan

The Environmental Management Plan is meant for mitigation, management, avoidance of the adverse impacts. It defines all the impacts and their remedies with highlighting the responsible personals to work on those mitigations. A mitigation plan is basically a mitigation matrix as given in Table 5.1 and Table 5.2. All these impacts and mitigations have already been given in previous section of this report. Project management and construction contractor will be required to adhere these mitigation measures throughout the project. For each mitigation measure to be taken, its location, timeframe, implementation and supervising responsibilities are listed in the EMP. The identified impacts and suggested mitigation measures with institutional responsibilities are tabulated in Table 5.1 and Table 5.2:

Table 5.1: Environmental Management Plan of Construction Stage

Anticipated Environmental Aspects and Impacts	Proposed Mitigation Measures	Institutional Responsibility		
		Implementation	Supervision	Monitoring
<p>Solid Waste</p> <p>Solid waste shall be generated in the form of excavation waste, excess fill materials, small concrete spills, broken bricks, wasted concrete material, wasted steel trimmings, scrap wood and metals, etc.</p>	<p>The construction site should be equipped with temporary bins for waste collection and segregation.</p> <p>All kinds of solid waste shall be kept segregated.</p> <p>Development of proper solid waste management system (Collection, storage, segregation, transportation and disposal).</p> <p>The waste collection and disposal schedule should be made so as to prevent any kind of nuisance at the site.</p> <p>The construction staff shall be trained regarding housekeeping practices.</p> <p>At the end of all processes, whatever left behind shall be disposed of through construction waste handlers.</p> <p>Municipal waste shall be stored in specific bins provided and managed through</p>	Construction Staff	PMU	Proponent

	arrangements of Local Government.			
<p>Water Quality</p> <p>There shall be additional load on ground water resources during operational phase..</p> <p>Construction activities may cause the generation of sanitary wastewater discharges in varying quantities depending on the number of workers involved.</p>	<p>Spills and wastage should be prevented which may cause contamination of ground water.</p> <p>Solid waste should be prevented to enter into water.</p> <p>Water consumption shall be kept at minimum and even the amount used also will mostly percolate to ground water table thus recharging it.</p> <p>Storm water shall be managed such that it can be used beneficially. The runoff shall be diverted to green belt areas of the project.</p> <p>Sanitary wastewater shall be discharged to sewerage system of from where this is disposed after treatment.</p>	Construction Staff	PMU	Proponent
<p>Air Quality</p> <p>Particulate matter may arise due to localized excavation in soil for foundation purpose, ground leveling activities, deposits of construction materials and also due to</p>	<p>Trucks carrying, soil, sand, aggregate and other materials will be kept covered with tarpaulin to contain the construction materials being transported within the body of each carrier.</p> <p>Regular tuning and maintenance of engines ensures good efficiency.</p>	Construction Staff	PMU	Proponent

<p>movement of off-road or on-road automobiles.</p> <p>Cutting, grinding and welding of steel structures may cause air pollution.</p> <p>Off-road or on-road automobiles shall also cause exhaust pollution.</p>	<p>Waste burning will not be allowed.</p> <p>Sprinkling of water on regular basis especially during dry seasonal conditions should be carried out to limit dispersion and suspension of particulate matter</p> <p>Regular sweeping of roads and parking areas to avoid deposition of dirt.</p> <p>The workers shall be provided with appropriate masks for use against air pollution due to cutting, grinding and welding.</p>			
<p>Noise</p> <p>During the construction phase of the project, noise sources may include heavy construction machinery, shuttering and scaffolding, cutting and grinding of metal parts, installation of columns and rafters, on-road and off-road vehicles.</p>	<p>All construction equipment should be maintained in good working order.</p> <p>The noise sources shall be enclosed with acoustic proof material to decrease the noise levels.</p> <p>Noise from construction equipment shall meet the applicable standard in PEQS.</p> <p>Avoid use of pressure horns.</p> <p>Provision and use of PPEs shall be ensured.</p>	Construction Staff	PMU	Proponent

	<p>Lubricate all moving parts of the machinery.</p> <p>Noise barriers shall be installed as practicable.</p> <p>Work shall only be done during day time thus sleep of the surrounding community shall not be disturbed.</p>			
Spillage of oil and other lubricants	Maintenance of the contracted and outsourced logistics shall be the responsibility of outsourced contractors.	Construction Staff	PMU	Proponent
Soil Soil may erode by exposure of soil surface to rain and wind during site clearing, earth moving, and excavation activities.	<p>Providing adequate surface material compaction and maintenance.</p> <p>Only localized excavation shall be done with drilling equipment.</p>	Construction Staff	PMU	Proponent
Traffic Flow GT Road remains congested most of the times due to goods transport vehicles serving various industries of District. A slight increase is apprehended due to the proposed project.	<p>The transportation of construction materials may be scheduled during off-peak hours.</p> <p>This is a small scale project and shall need transport of materials only few times.</p>	Construction Staff	PMU	Proponent

<p>Occupational Health and Safety</p> <p>Personal injuries such as cuts, burns, bruises expected.</p> <p>There may be risks associated with work at height.</p> <p>Due to interaction of workers from various backgrounds, there is possibility of contagious diseases.</p> <p>Construction activity pose particulate pollution hazard to workers.</p> <p>Fire safety measures.</p>	<p>All employees shall be trained for occupational health and safety training including training about safe work practices for prevention against personal injuries.</p> <p>First aid facilities should be readily available</p> <p>Construction workers shall be provided with adequate awareness and training about HSE aspects of the project.</p> <p>Provision and use of suitable Personal Protective Equipment should be made mandatory.</p> <p>Work at height should be performed under supervision of HSE Officer who shall issue work at height permit after taking all appropriate measures.</p> <p>Emergency response plan should be established and maintained</p> <p>Safety signs should be displayed.</p> <p>Smoking should be prevented to prevent fire hazard.</p>	Construction Staff	PMU	Proponent
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	<p>Electric earthing shall be done to prevent electric shock to workers.</p> <p>Welding should be done with all safety precautions.</p> <p>Safety shoes shall be worn by the workers while performing jobs related with electric equipment.</p> <p>Painting of shed should be carried out with all preventive measures.</p> <p>Industrial Safety Unit may assist in fire and other kinds of emergency management.</p> <p>Reporting and documentation of all incidents, accidents and near misses shall be ensured.</p>			
Construction materials such as sand, gravel etc.	<p>Stockpiles should be covered to prevent dispersion of materials</p> <p>These should be surrounded by low brick wall to prevent their spreading on the ground.</p>	Construction Staff	PMU	Proponent
Socioeconomic Impacts	<p>Aesthetic of the area should be protected so far as possible</p>	Construction Staff	PMU	Proponent

	<p>Unnecessary use of horns should be prevented</p> <p>Hire local people to the maximum possible extent if competent people found from the area</p>			
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Table 5.2: Environmental Management Plan of Operational Stage

Anticipated Environmental Aspects and Impacts	Proposed Mitigation Measures	Institutional Responsibility		
		Implementation	Supervision	Monitoring
<p>The electric generator and boiler shall also be sources of air pollution.</p> <p>Due to movement of vehicles, ambient air may get polluted</p>	<p>The electric generator shall be of latest type which shall be equipped with catalytic convertor to keep emissions within PEQS.</p> <p>Fit and Good quality vehicles will be allowed for the transportation of petroleum products and other goods with low vehicular emission.</p>	General Manager	Environment Consultant.	Proponent

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	<p>The transport vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions.</p> <p>Limited entry to vehicles under the indoor shed areas.</p> <p>Offices and control rooms shall be kept air conditioned.</p> <p>Workers shall be provided with specific masks to protect their breathing system.</p> <p>All the open soil shall be grassed or tuff tiled to prevent dispersion of disintegrated soil and fugitive dust.</p>			
<p>Water Quality</p> <p>The processing of fabrics shall consume 200-250 Gallons of water per day.</p>	<p>Septic tanks will be constructed for treatment of waste water. Waste water after treatment in septic tanks will be disposed off in drain.</p>	<p>General Manager</p>	<p>Environment Consultant</p>	<p>Proponent</p>

<p>Additional water shall be needed for sanitation purpose thus causing sanitary waste from toilets.</p>	<p>Screening of solid contents of water shall be done at source in order to decrease pollution load of effluent water.</p> <p>Drainage lines shall be periodically cleaned.</p> <p>There shall be separate lines for drainage of storm water and waste water.</p> <p>According to city district bye-laws, septic tanks shall be constructed for sewerage wastewater management.</p> <p>Special care shall be taken to conserve, and preserve water resources.</p> <p>The leakage of sewage shall be strictly prevented and if such a chance happens, immediate action</p>			
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	<p>must be taken so that mixing of the sewage with ground water or soil will be absolutely avoided.</p> <p>All drainage works shall be designed and constructed in accordance with the requirements of the EPA-Punjab.</p>			
<p>Noise</p> <p>Noise shall be generated by knitting machines, filing machines, electric generator.</p>	<p>The steel shed will be lined with glass wool sheet which has acoustic properties to absorb the noise from outside and inside sources.</p> <p>Better maintenance and lubrication of all the machinery may keep the noise under control.</p> <p>Regular monitoring of noise may be carried out every year to check the efficacy of control measures.</p> <p>The whole machinery shall be enclosed and isolated hence decreasing the impact of noise levels.</p> <p>Electric generator shall be equipped with silencer to control noise pollution.</p>	General Manager	Environment Consultant	Proponent

	Employees shall be provided with ear plugs to prevent entry of sound waves into ear canal.			
<p>Solid Waste</p> <p>Said project is a Petroleum products storage unit and no waste generated from project activity. Solid waste will generate from workers camp, office and lawns and trees..</p>	<p>All solid waste shall be carefully segregated according to the type and sold in the market for reuse and recycling as may be appropriate. Thus the industrial solid waste shall be managed in an environment friendly manner.</p> <p>Other packing shall be either reused or it shall be sold to open market for reuse or recycling.</p> <p>Municipal Solid Waste shall be carefully segregated according to the type and managed by .</p> <p>No on-site burning of wastes will be allowed at any time.</p>	General Manager	Environment Consultant	Proponent

	<p>Training of personnel in proper waste management practices.</p> <p>Provision of sufficient waste collection points and regular collection of waste.</p>			
<p>Occupational Health & Safety</p> <p>Manual material handling across all operations (loading and unloading of cylinders)</p> <p>Handling of goods</p> <p>Heat stress across all operations (during summer).</p> <p>Machine safeguards.</p> <p>Fire safety measures.</p>	<p>Better ventilation and air conditioning shall relieve the workers from heat stress.</p> <p>Fiber glass steel shed shall help in managing heat stress and noise pollution.</p> <p>All machinery shall be by default guarded.</p> <p>Provision of ergonomically designed seats for all of the operators.</p>	General Manager	Environment Consultant	Proponent

	<p>Weight of materials should be kept as low as these may not cause musculoskeletal problems for workers.</p> <p>All employees should undergo occupational health and safety training including training about safe lifting practices.</p> <p>First Aid kit shall be provided.</p> <p>Fire extinguishers and fire buckets shall be installed for fire safety according to PIEDMC bye-laws (Industrial and Commercial Building Regulations).</p> <p>Workers shall be provided with appropriate kind and number of Personnel Protective Equipment (PPE).</p> <p>All safety incidents shall be recorded and monitored with the objective of attaining zero incidences of mishaps.</p>			
Ecology	Plantation of trees shall be carried out in and around the project site.	General Manager	Environment Consultant	Proponent

	A large portion of the plot has been proposed to be planted with fruit trees, flowering plants and grass.			
Socioeconomic Impacts Local norms and values Standard of Living	Local norms and values should be respected. Unnecessary use of horns should be prevented. Local people shall be hired to the maximum possible extent if competent people found from the area.	General Manager	Env. Consultant.	Proponent
Traffic Flow A slight increase in congestion is apprehended at GT Road due to proposed project.	The transportation may be scheduled during off-peak hours.	General Manager	Env. Consultant.	Proponent

Environmental Monitoring Program

The purpose of monitoring is to get acquainted with actual quantitative assessment of environmental aspects to verify that their values are within permissible limits as defined by Punjab Environmental Quality Standards. Therefore, in order to remain rational with the help of quantitative assessments instead of merely making assumptions about status of environmental aspects, following environmental monitoring plan has been proposed:

Table 5.3: Environmental Monitoring Plan

Environmental Aspect	Parameters	Concerned Location	Frequency
Construction Phase			
Ambient Air	CO, SO _x , NO _x , O ₃ , PM	Project Site	06 Months
Exhaust Emissions	All applicable parameters	Exhaust pipe of Electric Generator	As electricity shall be continuous. The generator shall be seldom required. Therefore, its monitoring for once is enough.
Ground Water	All applicable parameters	Water Connection at site	06 Months
Noise	Industrial Noise	Project Site	06 Months
Solid Waste	Generation Rate according to type of waste	Project Site	Daily till the end of the project construction
Occupational Health & Safety	Fire, ERP, PPE's	Project Site	Daily
Operational Phase			
Exhaust Emissions	All applicable parameters	Exhaust pipe of Electric Generator	As electricity shall be continuous. The generator shall be seldom required. Therefore, its monitoring for once is enough.
Stack Emissions	All applicable parameters	Boiler Chimney	Annually
Ambient Air	CO, SO _x , NO _x , O ₃ , PM	Knitting section, Processing halls	Annually
Effluent Water	All applicable parameters	Effluent pipe	Annually
Noise	Industrial Noise	Electric Generator	Annually
Solid Waste	Generation Rate according to type of	Solid Waste Bins at	Twice a day

	Waste	Waste Point	
Occupational Health & Safety	Fire, ERP, PPE's	Whole Premises	Daily
Ground Water	Consumption rate	Meter Readings of main meter for whole building	Monthly

Equipment Maintenance Schedule

The project involves use of various kinds of machinery both in knitting and processing sections during operations. Maintenance & Repair plan shall be carried out as per procedures advised by the manufacturer and on need basis. Fire safety equipment shall be kept maintained and monitored monthly. The condition of the first aid box and PPEs shall be maintained regularly. The schedule of maintenance shall be daily, weekly and monthly basis for overall cleaning and maintenance check of all of the equipment. Effluent treatment plant shall be maintained by a dedicated plant operator.

Communication and Documentation

Progress evaluation, documentation and communication will play a vital role in good management practices. Steps given below will assist in effective communication and documentation.

A kick-off meeting may be arranged at the start of construction phase, which will communicate the importance of meeting. EMP will be provided to the construction contractor and discuss the implementation steps.

Operation/HSE manager will arrange departmental meeting regularly on weekly basis throughout the project. The purpose of this meeting shall be to discuss day-to-day problems arise during work, steps to be taken to resolve problem, overview on the progress of HSE department and contractor with respect to the EMP. An overview on monitoring plan and progress with respect to changes made in operations/documentation/EMP will also be discussed. All the HSE matters will be discussed in details and if any problem sought, another meeting will be called-on to discuss solutions within time.

Weekly meeting will be attended by Manager Operations/Administrator, HSE officer and contractor representative. Such meetings will help out in the effective monitoring, management and documentation of the environmental performance during construction and operations. Any issues that require attention of higher authorities will be communicated to Top Manager (Operations) for necessary action. Quarterly meetings will also be arranged which will be headed by Top Manager (Operations).

In the end of weekly and quarterly meetings, minutes will be issued that may be incorporated in the record register. Meeting minutes will also be sent to contractor and higher authorities for their own record. On the basis of decisions taken in meetings if any change in documentation required will be incorporated in the respective document.

Environmental Management Budget

The environmental management cost aside from other costs is as follows:

Table 5.4: Environmental Management Budget

Aspect	Quantity	Estimated Cost (PKR)
Tree Plantation	1000	50000
Occupational Health and Safety Management		2,00,000
Fire Safety		2,00,000
Training & Awareness		50000
Total Environmental Budget		500000

CHAPTER-6

PUBLIC CONSULTATION

PUBLIC CONSULTATION

General

This chapter includes the output of consultations carried out with the people of the project area. This elaborates the findings from the field and data collected from public. These include local residents who also carry out different businesses such as shop keepers, labour, farmers and entrepreneurs. These also include representatives of the management of M/S Amanat petroleum Storage. Their feedback regarding the project has been recorded through a questionnaire and interviewing them to fill the questions of questionnaire. Other stakeholders were also consulted.

Importance of Public Consultation

Public participation is an integral part of EIA. Public participation means that public should be consulted, informed, or involved in the decision making process and public should know about the project in detail. The "Policy and Procedures for the filing, review and approval of environmental assessments" requires proponents to consult with the affected community and NGOs during preparation of an environmental report. The "Guidelines for the preparation and review of environmental reports" contain a number of references to the need for public involvement. Public participation is compulsory under the Punjab Environmental Protection Act. According to PEPA Regulations 2000 under section 10 require that public notice should be published in English or Urdu in local newspaper in the affected area 30 days before the hearing. The public notice contains information on project type, location, name, address of the proponent and the place from where EIA report can be accessed.

The adequacy of the public consultation and information disclosure is one of the basic criteria used to determine the project compliance with the national/international safeguard policies.

Objectives

The objectives of this process were to:

- Inform the public about what is proposed project.
- Identify and involve all stakeholders, especially local residents, in the consultative and participation process;
- Share information with stakeholders on the design and construction of the proposed project and anticipated impacts on the physical, biological and socioeconomic environment of the project area;
- Understand stakeholders' concerns regarding various aspects of the project, including the existing available facilities and problems, construction of the project and the likely impacts of construction and operation related activities;

- Provide an opportunity for those otherwise unrepresented to present their views and values therefore allowing more sensitive consideration of mitigation measures and trade offs
- Understand the perceptions, assessment of social impacts and concerns of the communities in the vicinity of the proposed project;
- Provide an opportunity to the public in the public consultation session to provide valuable suggestions for the project design in a positive manner;
- Reduce the chances of conflict through the early identification of controversial issues, and consult them to find acceptable solutions.
- Increase public confidence in proponent, reviewers and decision makers.
- Provide better transparency and accountability in decision making
- Develop truly sustainable proposal.

Methodology

Guidelines for Public Consultation issued by Pakistan Environmental Protection Agency issued dated October, 1997 have been used for carrying out this process. For public consultation and participation, main stakeholders were interviewed and asked about their concerns. Subject specialists and field experts have also been consulted in order to get their technical verdict.

For ascertaining the perceptions of different stakeholders about the project (during construction/operation) consultation meetings were held with them. These meetings were carried out in the vicinity areas of Mouza Bheen Ke Tehsi Chunian District Kasur.

Firstly the project has been described briefly before the stakeholders in local language without going into its technical details. Their response has been recorded in the form of a questionnaire. In this questionnaire, brief introduction of the stakeholder is followed by their response in the form of their answers to asked questions pertaining to the project.

Identification of Stakeholders

Stakeholders are those who have a direct or indirect interest in project development, and who will be involved in the consultation process. During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. These included local people, other affected communities, proponent, government agencies and interested public. The stakeholders identified during field survey also included the local residents, politicians, private land & shop owners, shop keepers (renters), customers, pedestrians. Some of the local people were found hesitant to respond. They were engaged and taken into confidence that their response shall be beneficial to them and shall never harm them. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

Concerns of the Stakeholders

The project site exists at Mouza Bheen Ke Tehsil Chunian District Kasur. This unit has been surrounded by agricultural land.. The public consultation for establishment of M/S Amanat petroleum Storage has been carried out with specific scope of the construction and operations of this unit inside and outside the project site.. Their feedback has been summarized as follows:

- Most of the people of the study area perceive overall positive impacts as a result of establishment of PETROLEUM PRODUCTS unit. Their attitude towards the project is quite positive.
- They are of the view that the project will open up new direct or indirect job and business opportunities for the people of the project area. This will result in poverty alleviation though to small extent.
- People especially comment that this area had been uninhabited since long. There was no use of this land. With the project development, the overall standard of living of the people has improved. The establishment of this unit shall also contribute to this phenomenon.
- Local residents of the area should be preferred for filling job vacancies of the unit.
- Some people are of the perception that the unit shall not emit hazardous air emissions and shall have relatively clean workplace.
- Some of the people also responded that they do not have any link with what is going on inside the project.
- The farmers of the surrounding vicinity responded that if the establishment of the unit does not harm their agricultural land then they do not have any objections.
- The people also perceive accelerated economic activity due to the small business opportunities likely to emerge in the area, e.g. shop keepers, traders, suppliers, contractors, transporters, labor etc.

On the basis of the impacts of already established units, the public also have shown their apprehensions. These are as follows:

- After the establishment of the estate and subsequent establishment of industrial units, local demography of the area has been changed.
- It will create jobs for the locals.
- Revenue generation for the government.

- If our land, ground water and air do not get polluted then we do not have objections over the establishment of the unit.
- Some people have shown that they will neither be benefited nor be harmed by the project.
- The unit should manage their wastes wisely without harming local natural resources.
- Something should be done about the development of the locality.

Mitigation Measures proposed for addressing the Stakeholder's Concerns

- Local residents should be given priority while hiring during construction and operation phase of the proposed project.
- The waste water shall be managed in an environment friendly manner. It shall not be pumped into the underground at all. Instead an septic tank shall be installed to keep its parameters within PEQS.
- There shall no air emissions due to operations of the unit which can harm the surrounding community..
- The solid waste shall be managed by the management of PETROLEUM PRODUCTS unit
- There shall not be any displacement of the surrounding community.

CHAPTER-7

CONCLUSION & RECOMMENDATIONS

CONCLUSION AND RECOMMENDATIONS

Conclusion

The project aims at establishment of petroleum products storage and filling unit at Mouza Bheen Ke Tehsil Chunian District Kasur. According to the "Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000" the project falls in Schedule-II. Accordingly, this Environmental Impact Assessment report has been prepared for issuance of NOC/EA by EPA-Punjab, Government of the Punjab, Lahore before initiation of the project on ground. The study has been conducted according to Guidelines issued by Environmental Protection Agency-Government of Pakistan in 1997.

On the basis of this Environmental Impact Assessment (EIA) Report of the project, it is concluded that:

- i. There are no sensitive elements/segments of environment around the project site.
- ii. Gaseous emissions generated due to the operations shall be treated to keep their parameters within PEQS. Construction phase shall cause some particulate pollution. However, this shall be kept under PEQS with the help of applicable controls. Thus air emissions during both construction and operations phase of the project shall be within Punjab Environmental Quality Standards.
- iii. Wastewater generated due to operations shall be treated by in septic tanks to control its parameters within PEQS.
- iv. Noise level, waste water and solid waste will remain well within the prescribed limits of the PEQS.
- v. EMP as recommended in this EIA Report is to be put in place during construction as well as operations of the project.
- vi. EMP shall guide about specific actions deemed necessary to assist in mitigating the environmental impact of the project.
- vii. If steps described in EMP are fully practiced, the project shall not have significant harmful impacts.
- viii. Monitoring of all environmental parameters by a third party shall endorse that the project will run in accordance with legal requirements.
- ix. The positive impacts of the project outweigh negative impacts.
- x. Endangered species have not been found in the area which is expected to be impacted by the project.
- xi. The project does not involve displacement of the local population.

Recommendations

Being aware of the environmentally responsibility, the proponent has proceeded for this Environmental Impact Assessment study and making its report. The proponent aims to and commits to comply with all legal

requirements pertaining to environmental protection applicable for the time being.

On the basis of the potential impacts, the project can be categorized as favorable and having only low adverse impacts. The project potential impacts will be mitigated by adopting all suggested technical/engineering best practices and measures. The EMP developed needs to be fully implemented during the both construction and operation stage of the project.

Following are the major recommendations:

1. The project should be established according to the specifications as defined in documents. If any changes needed on the ground, these should also be documented. i.e. there should not be conflict between reality and documentation.
2. Environmental monitoring should be regularly carried out according to schedule defined in this EIA report.
3. All the legal and regulatory provisions should be complied with by-laws, Punjab Environmental Quality Standards etc. during all phases of the project.

Detailed and points wise recommendations have already been described in Chapter 4 and 5 and have been summarized in executive summary of this EIA Report.

The facts summarized as above, and the whole discussion made in the foregoing chapters of this report support that the project merits for issuing Environmental Approval by the Environmental Protection Agency-Punjab, Lahore for construction and operation of the project.

ANNEXURES

ANNEXURE-I

GLOSSARY

Air Pollutant:

Any substance that causes pollution of air and includes soot, smoke, dust particles, odor, light, electromagnetic radiation, heat, fumes, combustion exhaust, exhaust gases, noxious gases, hazardous substance and radioactive substances.

Biodiversity:

The variability among living organisms from all sources including inter alia terrestrial, marine and other aquatic ecosystem and the ecological complexes of which they are part; including diversity within species, between species and of ecosystems.

Climate:

The weather conditions prevailing in an area in general or over a long period typically averaged over a period of 30 years.

Ecosystem:

A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

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.

Environment:

Air, water, land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the aforesaid factors.

Environmental Impact Assessment:

An environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed.

Ergonomics:

Derived from the Greek *ergon* (work) and *nomos* (laws) Which means the science of work. It is a scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design workplace in order to optimize human well-being and overall system performance.

Initial Environmental Examination:

A preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an adverse environmental effect for requiring preparation of an environmental impact assessment.

Meteorology:

The scientific study of the atmosphere that focuses on weather processes and forecasting.

Noise:

The intensity, duration and character of sounds from all sources, and includes vibration.

Occupational Health and Safety Aspects:

Health and Safety Aspects pertaining to workplace.

Proponent:

The person who proposes or intends to undertake a project.

Standards:

Qualitative and quantitative standards for discharge of effluents and wastes and for emission of air pollutants and noise either for general applicability or for a particular area, or from a particular production process, or for a particular product, and includes the Punjab Environmental Quality Standards, emission standards and other standards established under this act and the rules and regulations made there under.

Waste:

Any substance or object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste, agricultural waste, nuclear waste, municipal waste, hospital waste, used polyethylene bags and residues from the incineration of all types of waste.

Weather:

The state of the atmosphere at a particular place and time as regards heat, cloudiness, dryness, sunshine, wind, rain, etc.

ANNEXURE-II**LIST OF ABBREVIATIONS AND SYMBOLS**

CEO	Chief Executive Officer
CETP	Composite Effluent Treatment Plant
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COD	Chemical Oxygen Demand
dB(A) Leq	Decibel (A) L Equivalent
EIA	Environmental Impact Assessment
EA	Environmental Approval
EMP	Environmental Management Plan
EMtP	Environmental Monitoring Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
ERP	Emergency Response Preparedness
IEE	Initial Environmental Examination
HSE	Health, Safety and Environment
KW	Kilo Watt
LESCO	Lahore Electric Supply Company
MSDS	Material Safety Data Sheets
MSL	Mean Sea Level
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
NO _x	Nitrogen Oxides
O ₃	Ozone
OHS	Occupational Health and Safety
PEPA	Pakistan Environmental Protection Act
PEQS	Punjab Environmental Quality Standards
PGA	Peak Ground Acceleration
PIEDMC	Punjab Industrial Estate Development & Management Company
PKR	Pakistani Rupees
PM	Particulate Matter
PMU	Project Management Unit
PPEs	Personal Protective Equipments
RCC	Reinforced Cement Concrete
SECP	Securities and Exchange Commission of Pakistan
SIA	Social Impact Assessment
	SIR Site Investigation Report
SO _x	Sulfur Oxides
Sq. ft.	Square Feet
TEVTA	Technical Educational and Vocational Training Authority
TMA	Tehsil Municipal Administration
TOR	Terms of References
TDS	Total Dissolved Solids
VOCs	Volatile Organic Compounds
WAPDA	Water & Power Development Authority

ANNEXURE-III**Team Members of EIA Study Project**

NAME	QUALIFICATIONS	STATUS IN PROJECT
Mr. M. Adnan Naeem	Zagum Abbas M.Phil Environment Science	Team Leader
Abdul Jabbar	M. Phil Zoology	Member
Miss Samina Fatima	M. Phil Applied Environmental Science	Repot writer
M. Muneer	M. Sc Environmental Science	Assistant Manager operation
Mr. Faisal	BE (Hons.) Civil Engineering	Civil Engineer

ANNEXURE-IV

Terms of Reference

Title:

Establishment of M/S Amanat petroleum Storage and site of the project is located at Muza Bheen Ke Tehsil Chunnian District Kasur Environmental Consultant Organization "M/ S Green Ways" to carry out the Environmental Impact Assessment of the project in accordance with the guidelines of EPA-Punjab. The consultant scope includes following activities:

- I. Collect all the information relevant/required for the project & are required to compile EIA Report for the client on the basis of information and documents provide y the client/ proponent.
- II. Description of the Proposed Project Activities
- III. Review of Alternatives
- IV. Field Survey
- V. Collection and Review of primary and secondary data as per requirement.
- VI. Review of existing environmental legislation, guidelines and standards applicable to the operation and assessing their applicability.
- VII. Stakeholders' Consultation (if required)
- VIII. Identification and evaluation of environmental impacts
- IX. Recommendations for mitigation measures
- X. Development of Environmental Management Plan
- XI. Any other item deemed necessary to complete the report in-line with guidelines/requirements of Punjab Environmental Protection Act-1997 (Amended) 2012.
- XI. Preparation of a Final Report to meet the requirements of Pakistan EPA.

The Environmental consultant shall prepare Environmental Impact Assessment Report ..

Proponent shall be solely responsible for obtaining the final approval after fulfillment of all pre-requisites as per Punjab Environmental Protection Act-1997 (Amended) 2012.

Client Signatures

Consultant Signatures

REFERENCES

- Information and data provided by the proponent
- Project feasibility report
- Technical design data related to the project
- Interviews with project related persons of project proponent
- Technical documents of various machinery/equipment
- Meteorological Data from Pakistan Meteorological Department
- Punjab Environmental Protection Act (Amendment) 2012
- Punjab Environmental Quality Standards for Ambient Air 2010
- Punjab Environmental Quality Standards for Noise 2010
- Punjab Environmental Quality Standards for Water 2010
- Guidelines for the preparation and review of Environmental Reports
- Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000
- Punjab Occupational Health and Safety Act-2019
- Population Data from Ministry of Population
- OGRA