ENVIRONMENTAL IMPACT ASSESSMENT REPORT

(EIA)

SUN TECH LUBRICANTS

AT 10-KM Sacha Soda, Mouza Bahar, Manawala Road, Sacha Soda, Tehsil & District Sheikhupura.

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EXECUTIVE SUMMARY

Intro

This executive summary presents an overview of the main findings of the Environmental Impact Assessment Report for **"Lubricant Blending / Reclamation & Grease Plant by M/s Sun Tech Lubricants (Lubricant Plant)" located at 10-KM Sacha Soda, Mouza Bahar, Manawala Road, Sacha Soda, Tehsil & District Sheikhupura**. The main goal of the Proposed Project is to provide a safe, economic and environment friendly Plant of Lubricant suppliers and direct consumers.

BRIEF OUTLINE OF PROJECT

Project	**Lubricant Plant by M/s Sun Tech Lubricants.**
Location of the project	10-KM Sacha Soda, Mouza Bahar, Manwala Road, Sacha Soda, Tehsil & District Sheikhupura.
Proponent Name	Tara Singh
Consultant Name	MHR Environmental Consultants
Storage Capacity	(10000-L)
Total area of plot	33-Kanal 10-Marla
Cost of the project	75-Million

PROJECT OBJECTIVES:

The overall aim of the Proposed Project is to provide a safe, economic and environment friendly Plant of Lube Oil in the area. Further objectives of the project are:

1. Maintain continuity in supply of Lube Oil to the country through distributors and quality of services to the consumers.
2. Ease in availability of grease / oil.
3. Help to overcome the scarcity of bulk Lube Oil due to huge gap between demand and supply.
4. Discourage deforestation with reduction in use of fire wood and fossil fuels.

Raw Material

Fired bricks and clay blocks
Cement composites, Steel
Concrete, Fabric, Glass, Metal
} Varies

MAJOR IMPACT AND RECOMMENDED MITIGATION MEASURES:

Key impacts related to the construction phase include:

- Construction Noise
- Solid Waste

- Soil Contamination
- Air Pollution
- Community and Workers' Safety

Mitigation Measure Recommended to be incorporated into the project include running the machines and vehicles on good quality (low-sulfur fuels) in good working order ensuring regular maintenance, tuning and servicing, and providing them with emission control devices, such as mufflers and silencers, etc. water suppression and covered transportation and storage of the construction materials and slow driving on unpaved roads will control dust emission. Regular testing for leakage detection will also be ensured. Solid waste of construction activities will be used for flooring, while the remaining solid waste will be managed as per practices in the area. For community safety, irrelevant persons will not be allowed inside. Safety of the workers will be ensured by encouraging workers to use PPEs. Detailed analysis is giving in chapter 5.

Key impacts reacted to the operation phase include:

- Noise
- Wastewater
- Solid Waste
- Gas Leakage
- Safety, Public Health & Nuisances

Wastewater will be municipal in nature. Solid waste will also be municipal in nature. Safety of the workers is an issue of prime concern in any occupational activity. Municipal wastewater will be handled via Septic Tank. Municipal solid waste will entirely be managed in accordance with the practices in the area. Wet suppression during floor cleaning will suppress dust emission. Noise from the vehicles will be mitigated by regular servicing and tuning. Safety issue will be managed by providing the workers with necessary PPEs (safety helmets, masks, safety shoes, ear plugs, special suiting for various jobs and areas, etc) and encouraging the workers to use them. Gas detection system will be installed to detect any leakage. An Emergency Response Plan and a firefighting plan will also be in place to deal with all sorts of emergencies. Proper First Aid Box and all safety measures will be provided to cater any emergency situation (complete gas leakage control plan is given in chapter 3).

PROPOSED ENVIRONMENTAL MONITORING PLANS:

During construction, ambient air quality for CO, NOX, SO2, PM2.5, PM 10 & SPM, noise level (tests), and Ground Water Quality will be tested using EPA Certified Labs and test report will be submitted to EPA Punjab as per

NOC Conditions as well as community and workers' safety (visual) need to be monitored. During Operational Phase Ambient air quality for CO, NOX, SO2, PM2.5, PM 10 & SPM, noise level (tests), and Ground Water Quality will be tested using EPA Certified Labs and test report will be submitted to EPA Punjab as NOC Conditions. Plan has been included in Chapter 6.

Sr#	**Monitoring Points**	**Parameters**	**Frequency**
1.	Emissions	CO, SO2, NOx, PM and Ringelmann	Monthly
2.	Ambient Air Analysis	CO, SO2, NOx, PM, O3, VOCs	Quarterly

Conclusion

The project is recommended for the issuance of Environmental Approval because the project proponent is willing to run the project in environment friendly way and to adopt the Environmental Enhancement Measures.

(1)
INTRODUCTION

1.1 GENERAL

The Project is of **M/s SUN TECH LUBRICANTS, 10-KM SACHA SODA MANAWALA ROAD, SACHA SODA, TEHSIL & DISTRICT SHEIKHUPURA**. A lubricant is a substance, usually organic, introduced to reduce friction between surfaces in mutual contact, which ultimately reduces the heat generated when the surfaces move. The property of reducing friction is known as lubricity. In addition to industrial applications, lubricants are used for many other purposes. It may also have the function of transmitting forces, transporting foreign particles, or heating or cooling the surfaces. Other uses include cooking (oils and fats in use in frying pans, in baking to prevent food sticking), bio applications on humans (e.g. lubricants for artificial joints), ultrasound examination, medical examination. It is mainly used to reduce friction and to contribute to a better and efficient functioning of a mechanism.

Lubricants have been in some use for thousands of years. Calcium soaps have been identified on the axles of chariots dated to 1400 BC. Building stones were slid on oil-impregrated lumber in the time of the pyramids. In the Roman era, lubricants were based on olive oil and rapeseed oil, as well as animal fats. The growth of lubrication accelerated in the Industrial Revolution with the accompanying use of metal-based machinery. Relying initially on natural oils, needs for such machinery shifted toward petroleum-based materials early in the 1900s. A breakthrough came with the development of vacuum distillation of petroleum, as described by the Vacuum Oil Company. This technology allowed the purification of very nonvolatile substances, which are common in many lubricants.

Although demand of Lube Oil / Grease is persistent throughout the year, supply of Lubricants from producers (or extractors) to distributors and marketing companies has been limited due to maintenance and overhauling shutdowns, which often creates shortages. Besides that, Lubricant producers are also limited in numbers and Lubricant marketing companies need to have a quota to be allocated by the producer. This factor makes Lubricant business vulnerable in the hands of Lubricant producers.

Additives *(Main article: Oil additive)*

A large number of additives are used to impart performance characteristics to the lubricants. Modern automotive lubricants contain as many as ten additives, comprising up to 20% of the lubricant, the main families of additives are:

- Pour point depressants are compounds that prevent crystallization of waxes. Long chain alkylbenzenes adhere to small crystallites of wax, preventing crystal growth.
- Anti-foaming agents are typically silicone compounds which increase surface tension in order to discourage foam formation.
- Viscosity index improvers (VIIs) are compounds that allow lubricants to remain viscous at higher temperatures. Typical VIIs are polyacrylates and butadiene.
- Antioxidants suppress the rate of oxidative degradation of the hydrocarbon molecules within the lubricant. At low temperatures, free radical inhibitors such as hindered phenols are used, e.g. butylated hydroxytoluene. At temperatures >90 °C, where the metals catalyze the oxidation process, dithiophosphates are more useful. In the latter application the additives are called metal deactivators.
- Detergents ensure the cleanliness of engine components by preventing the formation of deposits on contact surfaces at high temperatures.
- Corrosion inhibitors (rust inhibitors) are usually alkaline materials, such as alkylsulfonate salts, that absorb acids that would corrode metal parts.
- Anti-wear additives form protective 'tribofilms' on metal parts, suppressing wear. They come in two classes depending on the strength with which they bind to the surface. Popular examples include phosphate esters and zinc dithiophosphates.
- Extreme pressure (anti-scuffing) additives form protective films on sliding metal parts. These agents are often sulfur compounds, such as dithiophosphates.
- Friction modifiers reduce friction and wear, particularly in the boundary lubrication regime where surfaces come into direct contact.[3]

Mineral oil

The term "mineral oil" is used to refer to lubricating base oils derived from crude oil. The American Petroleum Institute (API) designates several types of lubricant base oil:

- Group I – Saturates < 90% and/or sulfur > 0.03%, and Society of Automotive Engineers (SAE) viscosity index (VI) of 80 to 120

  Manufactured by solvent extraction, solvent or catalytic dewaxing, and hydro-finishing processes. Common Group I base oil are 150SN (solvent neutral), 500SN, and 150BS (brightstock)

- Group II – Saturates > 90% and sulfur < 0.03%, and SAE viscosity index of 80 to 120

  Manufactured by hydrocracking and solvent or catalytic dewaxing processes. Group II base oil has superior anti-oxidation properties since virtually all hydrocarbon molecules are saturated. It has water-white color.

- Group III – Saturates > 90%, sulfur < 0.03%, and SAE viscosity index over 120

Manufactured by special processes such as isohydromerization. Can be manufactured from base oil or slax wax from dewaxing process.

- Group IV – Polyalphaolefins (PAO)
- Group V – All others not included above, such as naphthenics, polyalkylene glycols (PAG), and polyesters.

The lubricant industry commonly extends this group terminology to include:

- Group I+ with a viscosity index of 103–108
- Group II+ with a viscosity index of 113–119
- Group III+ with a viscosity index of at least 140

Can also be classified into three categories depending on the prevailing compositions:

- Paraffinic
- Naphthenic
- Aromatic

Synthetic oils

Petroleum-derived lubricant can also be produced using synthetic hydrocarbons (derived ultimately from petroleum), "synthetic oils".

These include:

- Polyalpha-olefin (PAO)
- Synthetic esters
- Polyalkylene glycols (PAG)
- Phosphate esters
- Alkylated naphthalenes (AN)
- Silicate esters
- Ionic fluids
- Multiply alkylated cyclopentanes (MAC)

Solid lubricants *(Main article: Dry lubricant)*

PTFE: polytetrafluoroethylene (PTFE) is typically used as a coating layer on, for example, cooking utensils to provide a non-stick surface. Its usable temperature range up to 350 °C and chemical inertness make it a useful additive in special greases. Under extreme pressures, PTFE powder or solids is of little value as it is soft and flows away from the area of contact. Ceramic or metal or alloy lubricants must be used then.

Inorganic solids: Graphite, hexagonal boron nitride, molybdenum disulfide and tungsten disulfide are examples of solid lubricants. Some retain their

lubricity to very high temperatures. The use of some such materials is sometimes restricted by their poor resistance to oxidation (e.g., molybdenum disulfide degrades above 350 °C in air, but 1100 °C in reducing environments.

Metal/alloy: Metal alloys, composites and pure metals can be used as grease additives or the sole constituents of sliding surfaces and bearings. Cadmium and gold are used for plating surfaces which gives them good corrosion resistance and sliding properties, Lead, tin, zinc alloys and various bronze alloys are used as sliding bearings, or their powder can be used to lubricate sliding surfaces alone.

Aqueous lubrication

Aqueous lubrication is of interest in a number of technological applications. Strongly hydrated brush polymers such as PEG can serve as lubricants at liquid solid interfaces.[8] By continuous rapid exchange of bound water with other free water molecules, these polymer films keep the surfaces separated while maintaining a high fluidity at the brush–brush interface at high compressions, thus leading to a very low coefficient of friction.

Biolubricant

Biolubricants are derived from vegetable oils and other renewable sources. They usually are triglyceride esters (fats obtained from plants and animals). For lubricant base oil use, the vegetable derived materials are preferred. Common ones include high oleic canola oil, castor oil, palm oil, sunflower seed oil and rapeseed oil from vegetable, and tall oil from tree sources. Many vegetable oils are often hydrolyzed to yield the acids which are subsequently combined selectively to form specialist synthetic esters. Other naturally derived lubricants include lanolin (wool grease, a natural water repellent).

Whale oil was a historically important lubricant, with some uses up to the latter part of the 20th century as a friction modifier additive for automatic transmission fluid.

In 2008, the biolubricant market was around 1% of UK lubricant sales in a total lubricant market of 840,000 tonnes/year.

As of 2020, researchers at Australias CSIRO have been studying safflower oil as an engine lubricant, finding superior performance and lower emissions than petroleum-based lubricants in applications such as engine-driven lawn mowers, chainsaws and other agricultural equipment. Grain-growers trialling the product have welcomed the innovation, with one describing it as needing very little refining, biodegradable, a bioenergy and biofuel. The scientists have reengineered the plant using gene silencing, creating a variety that produces up to 93% of oil, the highest currently available from any plant. Researchers at Montana State University's Advanced Fuel Centre in the US studying the oil's performance in a large diesel engine, comparing it with conventional oil, have described the results as a "game-changer".

IDENTIFICATION OF THE PROJECT:

This document presents the Environmental Impact Assessment (EIA) report for "**Lube Oil Reclamation & Blending / Grease Plant by M/s SUN TECH LUBRICANTS**" located at 10-KM Sacha Soda, Mouza Bahar, Manawala Road, Sacha Soda, Tehsil & District Sheikhupura. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/ cultural conditions and assess all possible impacts arising during operation phase of the project along with proposing suitable mitigation measures and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner. The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA before issuing the Environmental Approval.

1.2 IDENTIFICATION OF PROJECT PROPONENTS

Proponent Name	**Tara Singh s/o Hari Das**
Address	Mohollah Humwani, Dharki, District Ghotki.
CNIC Number	45101-9365658-7

1.3 NATURE OF PROJECT

This project is the Lube Oil Reclamation & Blending Plant.

1.3.1 SIZE OF PROJECT

Proposed Project will have a production capacity of 7500+MT/Annum with storage capacity of 10000-L.

1.3.2 LOCATION OF PROJECT

This project is to be located at 10-KM Sacha Soda, Mouza Bahar, Manawala Road, Sacha Soda, Tehsil & District Sheikhupura.

1.3.3 AREA OF PROJECT

Total Area of the Project is 33-Kanal 10-Marla. Schedule of area is given in Map.

1.3.4 COST OF THE PROJECT

Cost of project has been estimated PKR.75-Million.

1.4 DETAILS OF CONSULTANTS

For the preparation of the EIA Report of the proposed project, the proponent has hired the services of the environmental consultants; M/S MHR Environmental Consultants, 9-Umer Center, Mozang Road, Lahore. Team comprising of Environmental Engineers, Chemical Engineers, environmental experts and environmentalists has worked on this report. (MHR) is one of the accredited Environmental Consultancy Company in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. The firm provides the environmental services, litigation and consultancy to clients both industry and government. Also is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Baseline Studies
- Environment Management Plan (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF
- Monitoring and inspection
- Environmental modelling

Study team:
The following lists the names of experts involved in the making of EIA report:

- *Mr.Nadeem Shahzad,(Engineering Works)*
- *Mr. Shafqat Ali (Environmental Management / Coordinator)*
- *Miss Sonia Taimoor (Environmental Sociologist)*
- *Kiwan Hassan Khatana (Environmental Lawyer)*
- *Ms Fouqia Khalida (MSc Environment)*
- *Mr. Yasir Ali (Manager)*

1.5 PURPOSE OF PROJECT

The development of any Project leads to positive and adverse changes in environment and social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. The establishment of proposed project will cause will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus, an environmental and social study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

The main objectives of this EIA study are:

- To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the Project in that area.
- To identify pre-construction, construction and operation activities and to assess their impacts on environment.
- Provide assistance to the proponent for planning, designing and implementing the project in economic environment and maximizing the benefits to all parties in cost effective manner.
- To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.

1.6 DOCUMENT STRUCTURE

The report comprises of following chapters;

Chapter 1: **Introduction** (Briefly presents the project introduction, objectives and need of the study).
Chapter 2: **Scoping** (Comprises the policy, guidelines and statutory obligations concerning EIA study of the project)
Chapter 3: **Project Description** (Presents relevant information about the project and its major components).
Chapter 4: **Description of the environment** (Establishes baseline conditions for physical, biological and socio-economic conditions of the Project area).
Chapter 5: **Environmental Impacts and Mitigation Measures** (Deals with the potential environmental impacts and mitigation measures, which have been proposed to mitigation the environmental impacts of the Project).
Chapter 6: **Environmental Management Plan** (Outlines institutional structure for the implementation of the Environmental Management Plan).
Chapter 7: **Recommendation and Conclusion** (This chapter gives recommendations for elements of special interests and concludes the whole report).

(2)

SCOPING

2.1 SPATIAL & TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

First step (Pre-Environmental Impact Assessment)

The first step is to determine the types of processes to be chosen and the different potential sites to be studied. Following the financial and technical thinking throughout, the EIA becomes more precise at each phase, in order to propose the best processes and sites according to local resources and sensitivities.

Once the project is almost defined the EIA analyzes a small range of solutions which compares a few process variations and a few pre-selected sites. Sometimes there is only one site and only one process left.

Second step (detailed Environmental Impact Assessment)

The second step of the EIA begins by scoping and screening the main impacts to be studied. It is important to implement the "scoping" with local authorities and representatives of affected groups to avoid omitting potentially important impact. It is now appropriate to have the terms of reference of the EIA drawn up by a steering committee, in order to pinpoint the exact contents of the EIA and the best way to conduct it.

Pre-environmental Impact Assessment

This part constitutes the first step of the EIA. It leads from the pre-feasibility study to a well-defined project that can be shown to authorities and local representatives. This first step towards the project must be the result of a financial, technical and environmental analysis leading to the final project bringing together the best available technologies and the least sensitive sites. The environmental survey during this phase must analyze:

- Potential sites,
- Raw material
- Constructional processes,
- Transportation.

Site selection

The first task of this activity is to demarcate the site and other benchmarks, with the help of drawings prepared during the pre-construction and design phase of the project. Once marking is complete; the land will be cleared and prepared for subsequent construction activities. The whole purpose is to maintain the harmony of the area during construction.

Pre-construction/Design Phase Site Investigation:
The geotechnical and soil investigation of the project site will be carried out for determining the suitability of a site to support the structures, and other development works.

Geotechnical/Soil Investigation:
An extensive soil investigation of the project site will be carried out. The topographical survey will be undertaken by the surveying consultant to demarcate the area and measure the ground elevation. Subsequently, engineering details will be worked out, and working drawings, specifications for equipment and material will be prepared.

Selection of Contractor:
Once, the engineering details become available Builders and Developers will start to work on the project.

Construction Phase Contractor Mobilization:
This component involves the transportation of construction machinery and equipment to the project site and the establishment of the contractor's camp and office. The contractor will be responsible for the activities being carried out at the project site.

Raw material

Fired bricks and clay blocks Cement composites Concrete Sand Stone Steel Plastic pipes	Varies

Deforestation and reforestation usually necessitate an assessment of the impact on:

- **The remaining stands:**
  - Falling trees and skidders. The number of non-target destroyed trees can be higher than that of target trees.
  - Selected removal of certain species can lead to biodiversity depletion,
  - Systematic removal of the best trees leads to genetic erosion,
  - The absence of seed trees endangers the regeneration of the forest,
  - Large gaps in the canopy expose the remaining stands to wind-throw risks,
  - Endemic species can be threatened, by deforestation or reforestation,
  - Fire risks have to be considered both in the case of deforestation and reforestation particularly when using sensitive species like pines.
- **Water resources:**
  - Deforestation generally increases surface run-off which can involve erosion and floods,
  - Soil preparation for reforestation exposes it to both wind and water erosion. This erosion usually produces turbidity in water and sedimentation in the river beds.
  - Pollution can be generated by fuel leakage and the use of pesticides.
- **Air and climate:**
  - The major emissions into the air are smoke and dust which can hurt affected groups,

    - Climate changes can affect both micro-climate (generally increasing temperature and wind speed, and diminishing evaporation) and global climate with, for instance, the greenhouse effect caused by deforestation.
- **Soil:**
    - Deforestation and reforestation operations can lead to erosion, depletion of soil fertility and risks of landslides,
    - In some cases, fast growing plantations (i.e.: eucalyptus) can gradually both deplete soil fertility and acidify it.
- **Biodiversity:**
    - Destruction of large tracts of forest, without maintaining ecologically rich zones, is a major concern in forest exploitation,
    - Wildlife often suffers from noise pollution and increased pressure from poaching.

Constructional processes

It is important to note here that the EIA is implemented before project construction. This implies that data will not be available on site. The EIA team must at this stage include a process specialist to predict the various emissions and performances of the proposed processes and procedures.

Environmental issues are too complicated and interconnected to be solved one at a time. The limits of the "end of pipe" approach, commonly used during decades, are well-known and it is now necessary to use systematic approaches in order to introduce a more global conception of the environment and to address the source of the problems directly.

For the person conducting an EIA, this logical framework means that the sooner causes for concern are well understood, the better environmental issues are resolved. It is thus very important to put a strong emphasis on assessment before project implementation. This will prove not only more environmentally friendly but also more cost effective.

It is very important to note that technology is always evolving and, in the EIA team, it is the process specialist's role to propose the best available solution to any problem related to environmental considerations and human well-being. This chapter is mainly constructed to allow EIA authors to classify the project in comparison with international standards.

Transportation

In most cases, transport of raw materials, general supplies and final products causes an increase in traffic around the facilities. Transportation may have repercussions, hence the need to consider the five key activities concerned: planning transport development, siting transport facilities, the construction of transport infrastructure, maintenance and operation of transport infrastructure and the use of transport infrastructure and vehicle maintenance.

- **Planning transport development**

  If the creation of the project involves important changes in traffic conditions, the EIA must study the transportation alternatives both for the siting of transport facilities and for the modes of transportation. It is important to compare at this stage

the different possibilities of transportation (road, rail or shipping) and to choose the least expensive in terms of investment, maintenance, environment and security. A matrix analysis can be relevant in evaluating each possibility.

- **Siting transport facilities**

  Roads, railways and harbours are infrastructures which generally need their own EIA. The project EIA must nevertheless study this problem and propose a global solution for the project services which truly respects the environment. Any change in the road capacity also has to be seriously addressed, mainly for affected communities.

Project justifications

Once the different sites are pre-selected and a comparative analysis effected, and once the best technologies available have been selected to remedy possible environmental problems, the project is well defined and can be presented to the authorities and the affected populations.

The definition of the project represents extensive studies and work. This aspect must be valorized at this stage of the EIA to explain as precisely as possible the reasons which have led to advocate the project as it stands. Matrix explanation of why each site, resource, process, infrastructure, have been chosen over others can help to justify the project.

Depending on the authorities' requirements, the owners' choice or other considerations, the EIA plan can vary from case to case. Some EIAs study the different alternatives right to the end of the assessment and leave the final decision to the authorities, some others, as presented before, define the best project in the best site and then propose to study more precisely its environmental and social impacts. There are no standard best solutions, each case must be treated as a particular case where the best solution has to be defined by the steering committee.

2.2 IMPORTANT ISSUES AND CONCERNS RAISED DURING CONSULTATION

Local community perception with regard to the implementation of the project components has been carried out during this EIA study. This gave the perception of the general public about this project. The results of public consultation conducted in the study area showed a strong agreement among the attendees (official stakeholders, representatives, general public, local community leaders, etc.) that this project will improve overall socio-economic conditions of people of the area. They had little reservation regarding some adverse impacts on different environmental parameters during construction and operation stages of the proposed project.

1. Due to constructional activities of the project traffic issues will be come up.
2. Due to constructional activities dust emissions will be raised.
3. Due to constructional activities noise issues also be raised.
4. Others

To cure all these issues the proponent has already planned proper mitigation measures as discussed in accompanied Environmental Management Plan.

2.3 SIGNIFICANT IMPACTS AND FACTORS TO BE DETERMINE

The proposed public consultation schedule at various phases of the Project. During construction and operation of the project, public consultation is planned as follows:

i. Suggestions of the general public may be sought through press or other mass media whenever deemed necessary.
ii. Local NGOs (if any, at any time during project construction or life), particularly working in the sector of environmental sanitation, will actively be involved in public representation.
iii. TMA will frequently be contacted on matters concerning the progress, adverse impacts and mitigation measures.
iv. To identify and assess significant social impacts, of the project activities on the surrounding area and people and to propose suitable means for probable mitigation of the significant adverse social impacts.

(3)
PROJECT DESCRIPTION

This section of the study renders a detailed account of the project and its salient features, such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & material have also been examined as a response to possible environmental concerns.

The lubricant-to-surface friction is much less than surface-to-surface friction in a system without any lubrication. Thus use of a lubricant reduces the overall system friction. Reduced friction has the benefit of reducing heat generation and reduced formation of wear particles as well as improved efficiency. Lubricants may contain polar additives known as friction modifiers that chemically bind to metal surfaces to reduce surface friction even when there is insufficient bulk lubricant present for hydrodynamic lubrication, e.g. protecting the valve train in a car engine at startup. The base oil itself might also be polar in nature and as a result inherently able to bind to metal surfaces, as with polyolester oils.

Both gas and liquid lubricants can transfer heat. However, liquid lubricants are much more effective on account of their high specific heat capacity. Typically the liquid lubricant is constantly circulated to and from a cooler part of the system, although lubricants may be used to warm as well as to cool when a regulated temperature is required. This circulating flow also determines the amount of heat that is carried away in any given unit of time. High flow systems can carry away a lot of heat and have the additional benefit of reducing the thermal stress on the lubricant. Thus lower cost liquid lubricants may be used. The primary drawback is that high flows typically require larger sumps and bigger cooling units. A secondary drawback is that a high flow system that relies on the flow rate to protect the lubricant from thermal stress is susceptible to catastrophic failure during sudden system shut downs. An automotive oil-cooled turbocharger is a typical example. Turbochargers get red hot during operation and the oil that is cooling them only survives as its residence time in the system is very short (i.e. high flow rate). If the system is shut down suddenly (pulling into a service area after a high-speed drive and stopping the engine) the oil that is in the turbo charger immediately oxidizes and will clog the oil ways with deposits. Over time these deposits can completely block the oil ways, reducing the cooling with the result that the turbo charger experiences total failure, typically with seized bearings. Non-flowing lubricants such as greases and pastes are not effective at heat transfer although they do contribute by reducing the generation of heat in the first place.

3.1 **TYPE AND CATEGORY OF PROJECT**

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulation, 2000 (2022), the project of Construction of

"Lubricant Reclamation and Blending / Grease Plant" by M/s SUN TECH LUBRICANTS" falls in the A category under serial No.5 in Schedule II.

3.2 **OBJECTIVE OF THE PROJECT**

The objective of the project is Reclamation & Blending of Lube Oil to meet the market demand by M/s Sun Tech Lubricants, 10-KM Sacha Soda, Mouza Bahar, Manawala Road, Sacha Soda, Tehsil & District Sheikhupura in an environment friendly manner.

The objective of the proposed Project are as following;

- Storage and production of Lube Oil / Grease in storage tanks with ensuring safe conditions.
- To provide lube oil / grease and to provide best services to customers
- To provide lube oil / grease in adequate price as compared to market
- To provide the employment to the people
- To change the social life style of the workers
- To upgrade the socio-economic condition of the area

3.3 **ALTERNATIVES**

An open land under undisputed ownership is selected for the Establishment of Lube Oil Reclamation & Blending Plant. Selected site is quite suitable for the project. The proponent is owner in possession of the land. No conflicts with neighbors. The proponent also considered others sites in District Sheikhupura but all these sites have different issues. Hence, the selected one is clean of all types of disputes, possession issues, mortgage etc.:

- Easy road access to the market
- No settlements at a safe distance
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area in safe radius

3.3.1Technology Alternative

Lube Oil Reclamation & Blending Plant is well positioned to assist developing countries in the transition to modern fuels for the following reasons:

1. **Availability:** there is nothing exotic to invent or improve. The transportation system that moves it is in place, the tank to store it is available, and the appliances and equipment that provide heat and power are "on the shelf".

2. **Infinite shelf Life:** Lube Oil does not deteriorate over time unlike some other liquid fuels that gel, stratify or evaporate and must be protected from weather to prevent deterioration.

3. **High use density:** Compared to traditional lubes in terms of thick equivalency, over lube has ten times efficient.

4. Lube Oil can be transported, stored, and used virtually anywhere in the world. It does not require a fixed network and does not deteriorate over time.

The practical, operational and environmental characteristics of all four commercially available fuels are summarized in the following Table:

3.4 LOCATION AND LAYOUT OF THE PROJECT

3.4.1 Location of the project

Particulars	Details
Location	10-KM Sacha Soda, Manawala Road, Sacha Soda
Tehsil	Sheikhupura.
District	Sheikhupura.

3.5 **LAND OWNERSHIP**

Land / property documents are attached.

3.6 **GOVERNMENT APPROVALS**

Following NOCs are obtained and annexed:

- License from OGRA is attached.
- NOC District Counsel.
- Disposal of Effluent Water from Irrigation Department.
- NOC Rescue 1122.
- NOC from District Counsel IPWM.
- Firm Registration Certificate.
- Registration Certificate issued by HR Development, GoP.
- Registration Certificate Social Security.
- **Environmental Approval of existing plant**.

3.7 **LAND USE ON SITE**

The land is agriculture in nature which is selected for the proposed project.

3.8 **ROAD ACCESS**

Manawala Road, access of the proposed project site.

3.9 **RELOCATION AND REHABILITATION PLANS**

There exists no human settlement within a safe radius of the selected project site to be displaced owing to the commencement of the Proposed Project. No structure of any significance stands at the site to be relocated or dismantled. Land is already under undisputed ownership, and no fresh land is to be occupied; hence, no relocation and rehabilitation is required.

The proponent of the project aims that standard practices and procedure shall be followed for the restoration of areas disturbed during execution of developmental works.

The proponent has taken necessary measures for the restoration of the relevant areas which are distributed during the construction of infrastructure, like hiring the contractor for transfer of demolished waste and pavement of excavated land. The plants removed during construction phase will be replanted especially around the boundary walls of site and in the open spaces.

3.10 **DESCRIPTION OF PROJECT**

Typically lubricants contain 90% base oil (most often petroleum fractions, called mineral oils) and less than 10% additives. Vegetable oils or synthetic liquids such as hydrogenated polyolefins, esters, silicones, fluorocarbons and many others are sometimes used as base oils. Additives deliver reduced friction and wear, increased viscosity, improved viscosity index, resistance to corrosion and oxidation, aging or contamination, etc arrangements.

Non-liquid lubricants include powders (dry graphite, PTFE, molybdenum disulphide, tungsten disulphide, etc.), PTFE tape used in plumbing, air cushion and others. Dry lubricants such as graphite, molybdenum disulphide and tungsten disulphide also offer lubrication at temperatures (up to 350 °C) higher than liquid and oil-based lubricants are able to operate. Limited interest has been shown in low friction properties of compacted oxide glaze layers formed at several hundred degrees Celsius in metallic sliding systems, however, practical use is still many years away due to their physically unstable nature

3.10.1 **RAW MATERIALS**

The major raw material for the plant is crude oil which will be transported in tankers to the plan, maintaining safety standards.

3.10.2 **FINAL PRODUCT**

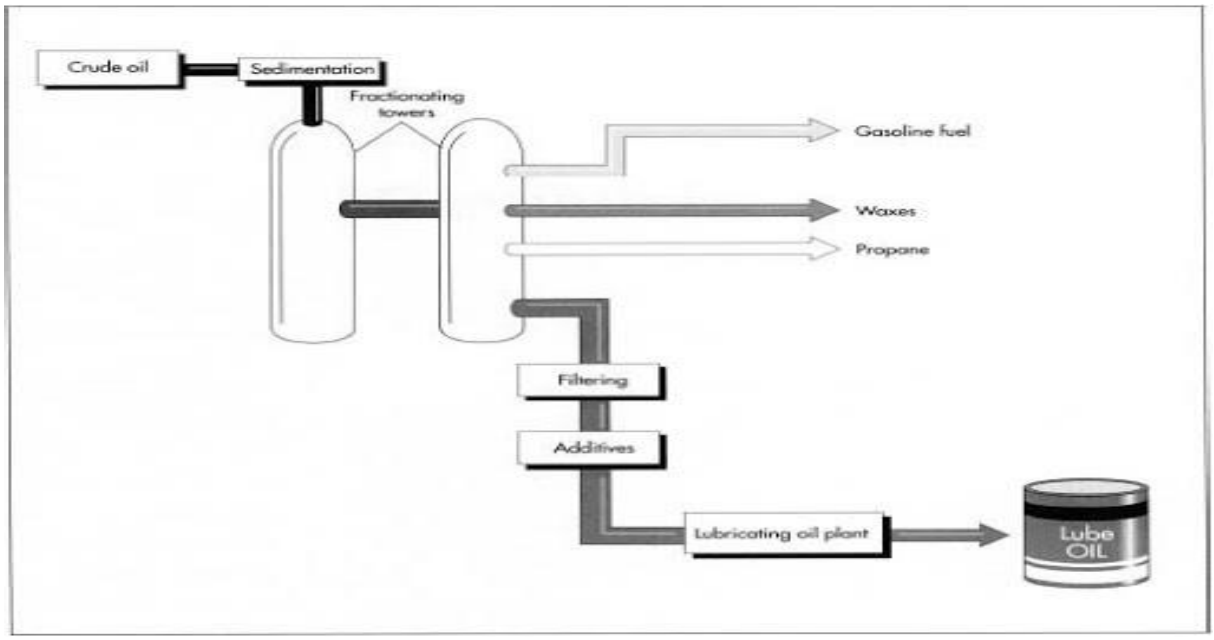
Lube Oil / Grease. Diagram below:

3.10.3 **CAPACITY**

The project envisages at Construction of Lube Reclamation & Blending / Grease Plant under the name & style Sun Tech Lubricants which will have a capacity of 7500+MT/Annum. Storage capacity will be 10000-L.

3.10.4 **PROCESS DESCRIPTION**

Lubricant is transported from production plant where Lubricant is stored in tank and filled into different packing for storage and distribution for various purposes. Transfer operation of Lubricants is not critical, as Lubricant is not a highly inflammable product.



3.10.4.1 **Filling of Storage Tanks:**

Lubricant tanks / drums will arrive on site and enter through main gate of plant as well as in main store room. A Tank should of 200-Liters.

3.10.4.2 **Handling of Lube:**

Once the consumption rate and storage capacity have been determined, one should decide what type of storage containers will be used. The correct size storage container is a direct reflection of the consumption rate and storage capacity. If a large consumption rate is determined, a large bulk storage tank may yield the best results, but if a low consumption rate is determined, a rack mounted storage system or 55-gallon drums may yield the best results.

3.10.4.3 **Visual Inspection / Segregation of Drums:**

Before the Lubricant drums are filled, a pre-fill inspection of the drums will be undertaken to ensure that the drums are safe to fill. The drums that are found to be in good condition will be filled, sealed, weighed and taken back to the factory. Drums found unfit for filling on visual inspection e.g heavily rusted or damage will be separated during visual inspection.

3.10.4.5 **Tank / Drum Filling**

Valve protection cap will be removed and drum is filled at filling Plant. The filling process will take place in the drum filling area. The plant's filling stock management system will be fully computerized. This will ensure that every single drum will be filled thoroughly and that instances such as over-filling, under-filling, and leakages do not occur.

3.10.4.6 **Final Inspection:**

Drums are visually inspected to examine their sound condition and presence of valve protection.

3.10.4.7 **Storage and Delivery of Filled Drums:**

At this stage drums are ready for storage and delivery. If required, the fit drums can be directly sent to the trucks for loading or the drums are sent for stacking in the area earmarked for purpose.

3.11 **Schedule of Tank:**

The outside dimensions of a 200-litre drum are typically 584 millimetres (23 in) diameter at the top or bottom rim, 597 millimetres (23.5 in) diameter at the chines (ridges around drum), and 876 millimetres (34.5 in) height.

3.12 **SUPPLIES**

3.12.1 **Water supply**

The surplus water during the construction phase of the whole project will be estimated to meet any unforeseen situation. The water demand will be fulfilled from ground water. Water requirement for maintenance of green belts will be done on daily basis by ground water through pumps and pipes to avoid wastage of water. The water requirement for the construction phase will be 2000 gal/day while during operational phase water requirement will be 800 1/day.

3.12.2 **Electricity**

Source of power will be WAPDA and a diesel fired generator of 50KVa.

3.12.3 **Manpower**

A total of 25-30 employees including mechanical, electrical, operators, sweepers and other managerial and office staff shall be working at project site.

3.12.4 **Firefighting**

The facility will have a comprehensive firefighting system covering all hazardous area and the other areas of the facility. This ensures that any five within the plant is quickly surpassed and extinguished. Firefighting and emergency catering facilities will include:

- Manual call point
- Emergency shutdown
- Fire Alarm hooter
- Fire Extinguishers (12kg)
- Trolley mounted fire extinguishers
- Fire monitor
- Fire hydrant

Size of fire water pipelines will be

- 3” dia main fire water header
- 2” dia distribution fire water pipelines
- 2” dia secondary distribution pipelines

3.12.5 **Health & Safety**

For health and safety of workers, 4-First Aid Boxes will be available and workers will be provided with following PPEs

Sr.#	PPEs	Qty.

1	Gloves	15 Pairs
2	Shoes	15 Pairs
3	Mask	15 Pairs
4	Anti-fire suits	15 Suits

First Aid

- If inhaled, move the person to a place where he/she can breathe some fresh air. Let him/her rest in a position that is comfortable, and if necessary, you can administer artificial respiration.
- If there has been skin contact with the gas, immediately remove the contaminated clothing. Rinse the affected skin with plenty of water for more than 20 minutes and seek medical help.
- In case of eye contact rinse the eye and the eyelid immediately with plenty of water for more than 20 minutes. Remove contact lenses, if any. Continue rinsing and seek medical help.

3.13 Emissions and effluents

3.13.1 **Wastewater**

Effluent arising from domestic activities will be treated in septic tank and then will discharged to local drain. Lube Oil Reclamation Plant and storage activities give rise to no waste effluent, hence no waste water treatment system is required. Municipal waste water will generate @ 600-650 per day.

3.13.2 **Air Emissions**

No Air emission are expected during process. In case of leakage, broken down pipes, LPG could escaped which will have certain impact on workers. For this, gas detector will be provided. Further PPEs will also provide to workers. Generator emissions will be controlled by proper enclosure, maintenance and tuning.

3.13.3 **Noise**

During operation, loading and un-loading will the cause of noise. Proper tuning of vehicles being mitigates this problem. Moreover, Tree Plantation along the boundary of Proposed Project and Plantation within the unit will further reduce noise, since plants and tree serve as noise absorbers. Construction activities noise will be temporary, and will be mitigated by measures.

3.13.4 **Solid Waste**

Solid waste will be municipal in nature and will be handled by solid waste management contractor as per practices of area. Solid waste will be generate @ 25-Kg / day.

3.14 Cost and Magnitude of Operation

The project cost is estimated to be PKR 75-Million.

Activities will include

1. Applying for and getting all necessary approvals and contracts.
2. Construction of boundary wall and other structures.
3. Installation / Construction of tanks and firefighting equipment.
4. Maintenance of Machinery and Tanks

3.15 Schedule of Implementation

a. *Phase-I (Start-up Phase)*

Phase-I is the start-up phase, which involves construction of boundary wall around the entire side. Most of the NOCs required have been taken and this report has been prepared to obtain EA / NOC from EPA.

b. *Phase-II (Main Implementation Phase)*

In Phase-II, required machinery will be purchased including storage tanks, filling area, transfer pumps, fire pumps for firefighting systems, etc. During this phase machinery will bought on site and installed.

c. *Phase-III (Wrap-up Phase)*

Phase-III is the wrap-up phase. In this phase all outstanding activities will be completed, required staff will recruited, and contracts with suppliers and purchasers will also be signed after which the operational phase finally commenced.

3.15.1 Abandonment Plan:

After completed of life, building will be demolished according to regularity standards. The garbage products and debris generated by destructing the civil structure will be disposed of at designated site while metallic and concrete structure may be reused, replaced or solid in the market. Dust / particulate matter to be generated will be minimized by constant sprinkling of water. An Environmental Management Plan will be put in operation for the safe disposal of waste matrix, debris generated and garbage produced after the destruction of assembled structure.

3.16 Vegetation Features

Mostly the land is barren so the project will not cause any major adverse impacts on the surroundings. Land selected for the proposed project is barren only some grasses and shrubs are present in scattered quantity. Fertile land is rare in the study area.

(4)
DESCRIPTION OF ENVIRONMENT

It is presents information on existing environmental and socioeconomic conditions of the proposed project area. It discusses aspects pertaining to geology and soils, climatic conditions, hydrology, ambient air quality and noise levels as well as land use. Further, the chapter presents details related to flora and fauna as well as socio-economic environment.

4.1 General

The existing environment around the site of project has been studied with respect to physical, ecological and socio-economic resources. The existing information to establish a database for the EIA of the project was collected from different departments, review of previous studies and through the site visits carried in out in the project area.

4.2 Physical Environment

The study examines the physical resources, topography, soil, climate, surface and ground water and geology of not only the project site but also the city as whole to assess whether the project under review can or does impact on any of these parameters. The description of physical environment of Sheikhupura city and the project site is present in the following sub sections.

4.3 Geological Formation

The soil of the Sheikhupura belongs to the typical alluvium of the Indo-Gangetic plains. The majority of the soils are loamy or sandy loam consisting of soil crust of different depths. Hardly any profile characteristics are observed; soluble soils are present in considerable amounts. The lower layer consists of kankar nodules. The soils have generally an alkaline reaction and are adequately supplied by phosphorus and potash, but are deficient in organic matter and nitrogen.

Geologically the alluvium is divided into khaddar, i.e., the newer alluvium of sandy generally light colored and of less concretionary composition; and Bhangar, i.e., the older alluvium of the more clayey composition, generally of dark appearance and full of kankar.

The soil differs in consistency from drift sand to loam and from fin silt to stiff clay. A few occasional pebble beds are also present. Layers of kankar in the Indo-Gangetic alluvium of the district are also observed.

4.4 Climate

The Climate of Sheikhupura is tropical. It is very healthy and salubrious. Except of few months of summer, Sheikhupura is a suitable place to live.

The people of Shiekhupura have to experience extremes of temperature. The summers are really hot and the winters are very cold. There are three main seasons in Sheikhupura, namely, summer, winter and rainy season. During the summers Sheikhupura experiences heat wave

Table 0:1: Seasons in Sheikhupura

Weather	Months
Autumn	1 Oct – 15 Nov
Winter	15 Nov – 15 Feb
Spring	15 Feb – 1 Apr
Summer	1 Apr – 30 Sep
Monsoon	July – Sep

4.5 Temperature

Sheikhupura weather is hot and humid. The city experiences an extreme climate during the months of May, June and July, when the city witnesses summer season. The temperature in Sheikhupura ranges between 40`C to 45`C, during the summer months. Sheikhupura experiences winters during the months of December, January and February. The temperature during this season varies between 5`C to 8`C. Given below are the maximum and minimum temperatures of Sheikhupura throughout the year;

4.6 Rainfall

Sheikhupura has a distinct rainy season, during which the weather is very humid. The rainiest months of the year are July and August, with June and September also gets some rain. During the rest of the year, barely any rain falls in Sheikhupura.

4.7 Topography

Sheikhupura the capital of Punjab is one of the most important cities in Pakistan and is situated along the banks of river Ravi. The city of Sheikhupura is bound by Sheikhupura district in the west and by Wagah on the east, while on south it is surrounded by the Kasur district. On the northern side, it is watered by the Ravi River. The city occupies around 404 square kilometers of land and is still expanding.

4.8 Wind Direction

The Sheikhupura region experiences westerly and north westerly winds during the winter and spring seasons, known usually as the dry stable times of year and southerly and south easterly winds during summer and monsoon. Wind speeds are low during winter picking up during spring season and peaking during the summer months.

4.9 Ambient Air Quality

Atmospheric pollution particularly in urban area has a strong impact upon daily life. Sheikhupura is the second largest city of Pakistan. Its economic growth and rising energy consumption are causing the increase in air pollution. The main sources of the air pollution are motor vehicles and industrial activities. SO2, NO2, CO2, CO,O3 and Particulate Matter (PM) are investigated as the pollution indicators.

The overall air quality in the study area is of moderate nature. Dust particles along with oxides of nitrogen, Sulphur and carbon are the major causes of air pollution in the ambient air quality.

It was however observed during the visit that environment of the project area is clean as the area is far away from the city center. Results of tests conducted to assess ambient air quality of the project area are given in annexures of the report.

4.10 Water Resources

Surface Water

There is no fresh surface water resource like canal or ponds, near the project area. Pajian drain is a municipal drain however running in close vicinity.

Ground Water

The city of Sheikhupura is underlain by the deep permeable aquifer formed within the alluvial plain of the Ravi River, which is the part of Greater Indus Plain.

Ground water is the principal source of municipal water supply in Sheikhupura. This is also the case in the immediate vicinity of the site. The City's drinking water is obtained from groundwater aquifer by means of tube wells located throughout the area. Groundwater is pumped from 400-800 feet and is generally good for direct consumption. About 83% of the city's population is consuming groundwater for drinking purposes. Results conducted to assess the ground water quality in the area in context of six parameters of concern for drinking water.

4.11 Drinking Water Quality

Local Municipal administration is providing drinking water to the residents of Sheikhupura. It claims the quality of water conform to the Drinking Water Standards.

The increase in population will have direct impact on the water sector for meeting the domestic, industrial and agricultural needs. Pakistan has now essentially exhausted its available water resources and is on the verge of becoming a water deficit country. The quality of water suppliers in many cities of Pakistan is deteriorating fast. Over pumping of groundwater due to extended drought has affected the water quality adversely.

4.12 Noise Level

Shiekhupura having population around 3 million. There are many a large, medium and small industries which are still working within city premises. Industrial activity and vehicular emissions are causing excessive noise in the city.

The affluent areas of Sheikhupura are quieter than rest of the city; the noise level in these areas is still far higher than the standards set by the World Health Organization and the Pak-EPA. Noise pollution in the city is on the rise with most residents complaining that the noise is becoming a public nuisance.

4.13 Biological Environment

Sheikhupura is enriched with the presence of natural flora and fauna, although with the growing population and development activities, the presence of the same has been somewhat affected.

There are no significant or well-shaped trees and shrubs on the project site as the site is located in plane land within the premises of unit.

4.13.1 Flora

Trees, also called the 'lungs' of the earth, are important for the restoration of the eco-system. People can benefit immensely from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds. Several species of the trees in Sheikhupura are being used in medicine and provide excess raw material for Indian ayurvedics. Trees such as Neem, Bhaira, Harrar, Dhair and Moosri have great medicinal value and can be grown easily in the city.

No trees are found in the vicinity of the project area. Therefore there is no adverse impact on the flora. There is no Reserve Forest in the 5 km radius. No threatened or endangered species and no medicinal plants are present in the project area.

4.13.2 Fauna

With an increase in the rate of urbanization, the ecology of Sheikhupura has been considerably affected and population of birds in Sheikhupura has reduced to just 85 including the resident and migratory ones.

Some birds and few animals like Buffaloes, cows, goats, donkeys, hen, rats, cats, dogs are present in the vicinity. Some reptiles like lizards are also present. The only amphibian seen the project area is frog. No threatened or endangered species are found in the project site. Similarly no wildlife is present.

4.14 Socio Economic Assessment

Social change is the consequence of almost any intrusion into the community life of any society. The intrusion can be in the form of any developmental projects or nonspecific, less tangible forms such as increased exposure to other cultures, technological changes and so on. The social change that results from intrusion into community life can also be beneficial, but can have undesirable or negative outcomes. Even that change in the long run may have positive effect on the social wellbeing of a community.

Social Impact Assessment is a methodology used for examining social change due to external sources, especially specific developmental projects, but also government policies, technological changes and social processes or anything that has a social impact.

The objectives of the given study are outlined as follow:

- To carry out the assessment of social impact.
- Acquire socioeconomic data to evaluate and identify the project interventions.
- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures and solutions to improve socio economic conditions.

- To analyze socio economic condition of community, with special reference to environment and conservation of natural resources

4.15 Demographic Profile of Sheikhupura

Sheikhupura, the capital of Pakistan is one of most important cities in the country, which is also known as "The Heart of Pakistan". Demography of Sheikhupura is spread over an area of 1,014 square kilometers. Average household size in 1998 was recorded as 7.12. In 1998, the total number of male population was estimated to be 48% and female population to be 52%.

According to the 1998 census, Sheikhupura population was nearly 6.8 million. Mid-2006 government estimates put the population at somewhere around 2million. It was ranked in the top ten literate district in Punjab with a literacy rate of 64.7 percent.

Urdu, which is the official language of Sheikhupura, is mostly used in the city. However, the people in Shiekhupura also use other languages like English, Punjabi. It is noteworthy that Pakistan is an Islamic country, where the majority of the population is Muslim. Sheikhupura, being a city in Pakistan, could not be an exception to this. As a result, 96% of the total population in Sheikhupura is Muslim. Other religions in the city accounting for the rest 4% are Christianity, Hinduism and Sikhism.

4.16 Health Facilities

The city of Shiekhupura in Punjab Province of Pakistan is served by a number of private and government hospitals offering world class medical facilities. The rural and urban areas are served by various other medical centers and dispensaries offering modern medical facilities. The hospitals, dispensaries and medical centers in Sheikhupura aim to provide the citizens best medical facilities and prevention from contagious and other harmful diseases. There is no health facility or any dispensary near the project area.

4.17 Educational Facilities

Sheikhupura have many public and private colleges and schools. Sheikhupura is Pakistan's among largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear science, pharmacology, telecommunication, biotechnology and microelectronics. The current literacy rate of Sheikhupura is 64%. No educational facility is present in the vicinity of the project area.

4.18 Transportation and Communication

Sheikhupura is one of the most accessible cities of Pakistan and the unique city of Pakistan where you can find Public and private Transport, 24hrs. a day and 7 days in a week.

Public transport is always available in the project area. To fulfill the remaining needs of transport there are thousands of rickshaws and taxis which run on compressed natural gas to reduce pollution in the city and of course about 75 percent of the residents have their own conveyances.

4.19 Industrial Activities

Sheikhupura trade and industries thrives on certain large-scale industries such as steel, textile, carper and IT industries. Shiekhupura is known as the industrial belt of Pakistan contributing the largest share in the GDP of the country. The city is home to 20% of Pakistan's industrial producers; manufactures include textile, rubber, iron, and steel. Handicrafts, especially gold and silver work, also flourish.

The proposed project area is also present in a plain area and is surrounded by mostly industries and little agricultural land.

4.20 Water Supply

The project has an independent water supply system comprising storage tank of sufficient capacity. Water is supplied to office and works through motor pump.

4.21 Telephone Facilities

Landline and Cellular telephone facilities are not present in the project area.

4.22 Quality of Life Values

No residential area is present near the project site; therefore, individuals and workers from neighbouring areas were interviewed. The individual assessed from the neighbouring communities of the project area were involved in small businesses and private jobs in nearby industries. Most of the people have sound earning sources and practice leisure lifestyles in fresh environments provided by the private housing societies in the nearby areas. Most of the people hesitated telling their incomes; however, incomes average in the range of 20000 to as much as 100000 PKR; enough to meet their basic needs. They avail all the basic facilities of healthy living and enjoy human rights and civil liberties.

The diseases prevalent in the community were stomach disorders, fatigue, joint pain, diabetes and arthritis. But it was also observed that all these disease are commonly due to improper diet and water contamination.

Almost all of the interviewed members were in favour of the project; rather they commented even more similar projects should be initiated in such areas as to yield lowering of goods prices and controlling inflation when not comprising on quality of the products and the environment.

4.23 Conclusion

The gathered and assessed data produces the conclusion that commencement of the project will prove to be beneficial for the inhabitants of the area. The project will provide job opportunities for the local inhabitants, and will provided basic religious and primary educational facilities to them, hence improving their socio economic status.

The project, overall, does not have major adverse impacts on the existing environment and people with due implantation of the mitigation measures. It is further concluded that project confirms to the local environment.

(5)
SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The following chapter describes the overall possible impacts of said project on the physical, biological and socioeconomic environment due to the location, Design, during construction phase, during operation phase of the project and mitigation measures to minimize the significance of the possible impacts. The anticipated impacts related to propose housing have been assessed and mitigation measures are provided accordingly.

5.1 General

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The potential impacts from the project area are identified and assessed based on the type and scale of the various activities associated with this project.

Several aspects and potential impacts were identified for each phase (Project Location, Construction and Operation) of the development, with impacts evaluated in terms of their nature, occurrence, possibility and severity potential.

5.2 Screening of Potential Impact

Several impacts are likely as a result of the construction and operation of the project. Such impacts may be direct, indirect or ultimate. For the purpose of this EIA, these potential impacts (whether direct, indirect or ultimate), are assessed based on their magnitude (short-term or long-term) and effect (positive or negative). Impacts are also classified in three group: impacts due to project location, impacts as a result of project construction and impacts as a result of project operation.

All the potentially significant environmental impacts from the project are grouped below:

Air Environment

- Impact on ambient air quality

Noise Environment

- Impact on ambient noise

Water Environment

- Impact on surface and ground water quality

Land Environment

- Impacts on land use

Ecological Impacts

- Impacts on trees/vegetation
- Impacts on forests and wildlife

Socio-Economic Impacts

- Impacts on other infrastructure
- Impacts on employment
- Impacts on public health and safety
- Impacts on cultural resources
- Impacts on aesthetics

5.3 Impacts Due to Project Location

Proposed project will have both socio-economic and environmental implications as discussed in the sub-sections below.

5.3.1 Relocation of People

Currently, there are no infringements on the project site that may be affected therefore relocation exercises are not required.

5.3.2 Loss of Vegetation

Considering the scale of the project and commonly found flora and fauna within the project influence area, no significant adverse effects are envisaged on the ecology of the area.

5.3.3 Shifting of Utilities

There will not be any shifting of existing utilities such as water supply pipelines, sewers, electrical lines, etc. due to the proposed project.

5.3.4 Impact on Archaeological/Cultural Property

Within the project influence area there are no significant archaeological properties, hence no impact in this area is anticipated.

5.4 Impacts Due To Project Design

Design of the proposed project can have impacts on the environment if it is not prepared accordingly. It is necessary to consider a sustainable project approach. Sustainability is an important issue to consider in design, not only due to environmental concerns but also due to economic and social matters, promoting architectural quality and economic advantages.

5.5 Design Phase

At the design phase, no considerable impact would occur on land, soil topography, ground water, and on people of the area. However, in pre-construction phase a management system should be provided at design level so impacts can be reduced. Design of the building would adhere to all standard technical requirements in order to avoid adverse impacts on environment and human health. All tanks and piping will be done as per standards.

- Storage tanks and fittings are designed as per prescribed procedure.

The complete design of said project is made as per requirements of OGRA and they have granted NOC to said company so there will be no such impacts due to design of project. Complete details of tanks are given on map.

5.6 Impacts During Construction Phase

Environmental Aspects	Impacts and Mitigation Measures	
	Impacts	**Mitigation Measures**
Economy Improvement	• During construction Phase, through the use of locally available materials including cement, building blocks, metals, concrete, ceramic tiles, timber, sand, electrical cables etc, the project will continue towards the growth of economy by contributing to the gross domestic product.	• No mitigation measures required.
Employment Opportunities	• With the Implementation of the project, there will be employment opportunities for casual workers from the local community. The exact number of workers to be hired will depend on the magnitude of construction activities during construction.	• No mitigation measures required.
Air Quality	• During construction phase particulate matter will be the main pollutant which will be generated during the site development	• Dust emission will be minimized through strict enforcement of

	activities, such as leveling of land, filling activities, transportation of construction material to the project site from various places. • Due to increased vehicular movement increase in NOx and CO concentrations will be observed at the project site. However, the pollution level in the ambient air will be negligible and also it is a temporary Phenomenon. As most of the construction equipment will be mobile, the emissions are likely to be fugitive and not concentrated on a single source or place. As the impacts will be localized in nature, the areas outside the proposed project boundary are not likely to face any significant adverse impacts with respect to ambient air quality.	onsite speed controls as well as limiting unnecessary traffic within the project site. • The traffic routes on site will be sprinkled with water regularly to reduce the amount of dust generated by construction vehicles. • Construction machinery will be kept away from walkways and at safe places where the chances of human interventions are relatively less. • Construction machinery will be properly tuned, serviced and monitored on regularly basis. • All vehicles, construction machinery etc will maintained in good working condition in order to minimize pollutant emissions.
Water Quality	• During construction phase, water will be required only for construction of structures, sprinkling on roads for dust suppression, domestic uses of the construction workers, that too only during day time. • Water will be used mainly for concrete mixing, sanitary and washing purposes. • No high water consuming activity is likely to occur during construction so the water usage during development of proposed project would not reduce the water availability for other activities within the area.	• Workers will be trained for water conservation and reuse of water where possible.
Relocation of Utilities	• The construction of the project will not relocate the existing public utilities.	• No mitigation measures required.
Poverty Alleviation	• Construction of the proposed project will generate the employment opportunities. This will be a temporary minor positive impact.	• No mitigation measures required.
Solid Waste Generation	• During excavation of the site for foundation works and landscaping, solid waste will be generated. The waste will consist of metal cuttings, rejected materials, surplus materials, excavated soil, paper bags, empty cartons,	• Waste generated during construction will be recyclable and will be reused during construction. The left

	empty cement bags among other types of wastes.	over construction materials at the end of construction will be used in other projects rather than being disposed-off (if required). • Recyclable material will be separated at source which will then be handed over to the waste contractor. • Waste bins will be placed at the construction site for waste materials including plastic, paper, and wood. • The cement bags and other such items will be handed over to contractor.
Noise Pollution	• During construction phase, the major sources of noise will be due to operation of construction equipment such as concrete mixers, generators, cranes, pumps, compressors, vibrators etc. the operation of such equipment will generate noise ranging between 70-85 dB. Due to moderate levels of construction activities, the anticipated noise generation during construction phase will be mostly confined to the facility itself and not anticipated to have significant adverse impacts on the surrounding ambient noise levels.	• Unnecessary blowing of horns will be strictly prohibited. • In order to safeguard the construction workers working at noise generating sources, these personnel will be provided with proper personal protective equipment such as earplugs, earmuffs etc. Hence, no significant impact is envisaged due to the operation of the noise generating equipment at the project site, if suitable mitigation measures are adopted. • In order to have less impact on noise levels in the air, the major works will be carried out during day time as far as possible. • Equipment noise will be reduced at source by

		proper maintenance and repair of construction machinery and equipment
Ecology	• The proposed project site is devoid of forest or thick vegetation. Only wild grasses or small bushes which have grown due to non-cultivation of the area will be removed during levelling operations. Hence, there will not be any major impact on the terrestrial ecology of the project site due to construction activities.	• After completion of the construction work, the damaged area due to construction works will be restored. • After the project completion, plants and trees will be planted on the proposed site that will in turn enhance the aesthetic value.
Workers Health, Safety and Environment	• The construction activities may pose negative impacts on the health and safety of workers	• The contractor will ensure that the workers and labors are trained in safety procedures for all relevant aspects of construction. • Workers will be provided with proper safety equipment such as helmets, goggles, masks where required. • Formal emergency procedures will be developed. First Aid Kit will be kept available at the site along with list of emergency phones to be contacted in case of any emergency. • Warning signs will be displayed in local language where required.

5.7 Impacts During Operational Phase

5.7.1 Land and Soil

After the end of the construction phase the area will be restored back to its original state; different ornamental plants and native tree species will be planted. This will improve the overall ecology, aesthetic and landscape of the area whereas; the un-paved roads will be converted to metalled roads. This will have positive and significant impact on the land and soil condition of the area.

Nature of Impact

This impact is considered to be positive, long-term and significant.

5.7.2 Solid Waste Management

Solid waste generated from proposed project will be domestic in nature. Solid waste will be organic in nature and it may produce vector which could transfer diseases to humans and can be the cause of public nuisance.

Nature of Impact

The nature of impact will be direct, medium, long-term and significant.

Mitigation

Following mitigations should be adopted to reduce the issues related to the solid waste:

- Bins will be provided to collect solid waste; these bins will be emptied by sanitary staff. End disposal and solid waste management will be done as per area practices.
- Solid waste should be stored in the covered bins in order to avoid the growth of vectors and rodents as well as to control the odour and to reduce public nuisance
- Solid waste should be collected and transported to the waste disposal site on daily basis

5.7.3 Wastewater

There will not be any industrial activity so no wastewater will be generated, domestic wastewater will be treated by passing through septic tanks and then discharged in municipality drain.

5.7.4 Air Pollution

Project only involves storage and filling of cylinders, not any industrial activity so there will be no emissions. Only dust will be generated during floor cleaning that will be controlled by water sprinkling. In case of leakage, broken down pipes, LPG could escape which will have certain impacts on workers. For this, Gas detectors will be provided. Further PPEs will also be provided to workers to cater this situation and ensure safety and health.

Generators will be provided with proper enclosure; proper maintenance and tuning of generator will be ensured to mitigate air emissions due to generator.

5.7.5 Noise and Vibration

Project only involves storage and filling of cylinder, not any industrial activity so there will be no noise generation. Noise will only be generated during transportation, for this only those vehicles will be used that are properly tuned and maintained and are equipped with silencers. Also excessive use of horns will be avoided. Further tree plantation will be done as it acts as noise absorbers.

5.7.6 Traffic Management

Proper parking area is provided for traffic management. Traffic management plan will be as follows:

	Traffic Management Plan	
Management Plan	• Heavy vehicles shall only be to enter and leave the site during day hours. • Speed limit will be ensured • LPG Filling will be on proper places within project boundary • Cars will be parked on proper parking area.	
Monitoring	**Responsible**	**Monitoring Duration**
	Environmental manager	Weekly basis

4.7.7 Emergency Response

Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include;

- Fire hazard

Fire Hazard

During operational phase of the project, fire hazard poses a serious threat. Firefighting equipment details are mentioned on map.

Mitigation

- Fire extinguishers should be properly maintained and checked periodically; and will be installed on key points.
- Adequate fire hydrant system should be installed.
- Flammable materials should be prohibited in the premises.
- Fire alarm systems should be maintained for detection and warning of fire.
- Pressure gauge should be checked monthly.
- Adequate training of workers on use of firefighting system to deal with the situation.
- Administration of the unit will make a proper evacuation plans for emergency escape from all halls.
- Emergency call service must be made available.
- Firefighting team must remain ready at all times.

5.7.8 Safety Concerns

Operation of the project may cause some concerns for safety, public health and nuisances within the project area.

Mitigation:

- Personal Protection Equipment (PPEs) such as ear plugs, safety Helmets, Gloves, Goggles and Masks will be provided to the employees to ensure their safety at work place.
- Workers' awareness and safety wall chart showing safety symbols and other necessary information will be displayed at various places.
- First Aid Box will be kept in every department which will be within the approach in case of any injury or mishap.
- To avoid any chance of fire, a comprehensive firefighting system will be developed that includes all types of fire Extinguishers, fire hydrants, sand Buckets and firefighting Vehicles.
- Basis medical and safety training will be held from time to time to minimize the risk of health and safety issues which can result from ignorance (ergonomic hazards in particular) in the project premises.

5.8 Potential Environmental Enhancement Measures

Following are the positive impacts of the Proposed Project that will enhance the overall socio-economic and ecological condition of the Project Area.

5.8.1 Employment/Poverty Alleviation

The employment opportunities in the Project Area will be increased due to the development and operation of the proposed project. During construction and operation of the proposed project unskilled workers will be required as labours, sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office. In totality, the overall economic conditions of the area will be improved.

5.8.2 Increased Business Opportunities

For construction of the proposed building a number of raw-material will be required. Many venders can supply the required stuff on daily and weekly basis. This will serve as a new business opportunity and it will enhance the socio-economic status of the people direct linked with it.

5.8.3 Tree Plantation

The tree plantation will be carried out along the boundary of the Project Site, and Open green spaces as the part of the proposed Project. This will include plantation of ornamental as well as indigenous species of the plants. The plantation will improve that overall ecological conditions of the area. Trees height will be between 3-7 ft. Total number of plants and trees will be approximately 50. Spacing between plant to plant will be 6-8m.

(6)
ENVIRONMENTAL LEGISLATIVE REQUIREMENT AND FRAMEWORK

General

This chapter deals with the relevant policy, a legal and administrative framework instituted by the Government of Pakistan and Punjab for the protective of Environment. All the relevant provision of these policy and legal frame works have been duly considered in this environmental assessment study. In addition to this, the roles and responsibilities of the proponent and other key players such as EPA, Punjab under the legal frame work of PEPA, 1997 (amended in 2012) has also been discussed in this section. The legal set of documents which will applicable to this project is also discussed in this chapter.

Policy Framework

The ministry of environment was responsible authority for policy making on environmental protection in Pakistan. With the 18th amendment all the power of environmental legislation have been entrusted to provincial government. Presently EPD, Punjab is the legislator department in the present scenario whose draft is reviewed by law department, provincial environment protection council and finally approved by provincial assembly.

National environment policy (2005) provides an overarching framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS), 1992, National Environmental Action Plans, and other existing environmental related national policies, strategies, and action plans. It also provides broad guidelines to the federal government, provincial governments, federally administered territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

Legal Framework

The Govt. of Pakistan (GOP) has promulgated laws / acts, regulations and standards for the protection, conservation, rehabilitation and improvement of the environment. In addition to this, they have also developed environmental assessment procedures relevant to the proposed project.

Pakistan Environmental Protection Act 1997 (Amended 2012)

After implementation of the 18th amendment government of the Punjab, EPD adopted the federal act as such which is now called Pakistan Environmental Protection Act, 1997 amended in 2012. All the rules and regulations made there under have been adopted by EPD.

Pakistan Environmental Protection Agency (Review of IEE / EIA regulations, 2000

These regulations provide criteria for projects requiring IEE and EIA. The projects have been divided into two schedules according to the scoping of project.

The proposed project fall under schedule 1 at serial No.A(2) which is titled as “Projects involving repacking, formulation or warehousing of agriculture products”. Therefore, this

project is required to submit EIA before Environment Protection Agency, Punjab for its approval under section 12 of PEPA (2012). They also briefly describe the procedure for preparation and review of environmental reports in the department.

Punjab Municipal Solid Waste Management Guidelines, 2007

Punjab Municipal Solid Waste Management Guidelines, 2007 provides the general guidelines to the provincial government departments, local governments, private operators and other agencies that initiate to operate any solid waste management activity in urban areas.

The present set of guidelines is aimed to cover only the municipal solid wastes. Therefore, hazardous wastes do not come under the purview of these guidelines. Various components of solid waste management such as waste generation and collection, waste transfer, recovery of useful components, waste incineration, composting, bio-gas generation and land filling are covered in these guidelines giving technical guidelines to do these operations with minimal impacts to the environment. For the disposal of waste by land filling, it provides the general, design and operational guidelines. Apart from that, these guidelines also explain the pollution control system for the landfill site with design details. As far as environmental monitoring is concerned, these guidelines also prescribed the National Environmental Quality Standards for municipal and liquid industrial effluent and ground water Quality Monitoring Standards.

Pakistan Environmental Assessment Procedures, 1997

Pakistan Environmental Assessment Procedures, 1997 is in fact a package, which contains the following, sets of information relevant to the proposed Project.

Policy and procedures for filing, review and approval of Environmental Assessment Reports.

It describes environmental policy and administrative procedures to be followed for filing of environmental examination / assessment reports by the proponents and their review and approval by the concerned environmental protection agencies.

Other relevant laws

Punjab Local Government Ordinance, 2013

Environmental protection is devolved subject under Punjab Local Government Ordinance functions conferred by or under the Punjab LGO, 2013 and in performance of such functions may exercise such powers, which are necessary and appropriate. Until different provision, rules, regulations or bylaws are made, the local governments may exercise such powers as are specified in the Punjab LGO, 2013.

Canal and Drainage Act, 1873

This Act entails provisions for the prevention of pollution of natural or man-made water bodies.

The provincial government may by notification in the official gazette, prohibited the discharge of any effluent, including any solid or liquid matter or combination of them from industrial, municipal or any other source, into any river, canal and drainage work including any natural drainage channel.

In case of contravention of sub-section (1), the Divisional Canal Officer, after such enquiry including taking of sample, may impose such special drainage charges as may be prescribed and shall take other necessary steps to prevent such contravention and consequential cost so incurred shall also be recoverable from the person found responsible for such contravention.
After the publication of notification under sub-section (1), any person, organization or entity, interested in discharging such effluent into any river or drainage work, including any natural drainage channel, shall apply to the Divisional Canal Officer or any other person authorized by the Provincial Government in this regard, for grant of permission for the discharge of such effluent.
The applicant shall obtain a certificate of no adverse impact of such discharge on environment from the authority designated in this regard under any law for the time being in force relating to environment.

Labour Law
Construction and Operational activities during the course of construction could affect the occupational health of the workers. Quantitative national standards for occupational health are yet to be developed in Pakistan and employers are required to abide by the labour laws in respect of their own employees and also ensure that contractor to follow the relevant labour laws and rules relating to safety of workers. The proponent will ensure that the labor force engaged is not exposed to any danger by monitoring the contractor's work frequently. Labour Department Government of the Punjab is relevant department who cares for the implementation of labour laws and supervisor of ILO occupational and health guidelines.

Pakistan Penal Code, 1860
The Pakistan penal code 1860 deals with offences where public or private property or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code empowers the local authorities to control noise, noxious emissions and disposal of effluents. The NEQs enforced by EPA supersede the application of this legislation and industries and municipalities. The Penal Code, however, can provide a basis for the client to coordinate its activities with the local authorities to ensure that its construction activities do not become a cause of public nuisance or inconvenience.

Factories Act, 1934
The clauses relevant to the proposed project are those that concerned the health, safety and welfare of workers, disposal of solid waste and effluent and damage to public and private property. The Act also provides regulations for handling and disposing of toxic and hazardous materials. Given that the construction activity is classified as "Industry", these regulations will be applicable to the project contractors. In addition to this, the following will also consulted.
Employees cost of living relief and allowances – workers Children (Education Law) Companies Profit (Workers Participation) Law, Law of Essential Services, Industrial Relations Law, Workers Welfare Law, Employees Old Age Benefit Law, The Shop Act, The Law of Social Security, The Law of Payment of Wages and Minimum Wages, The Law of industrial and commercial establishments.

Public Participation and Consultation

Public Participation and Consultation are mandatory for EIA procedure. Sectorial guidelines issued by Pakistan Environmental Agency are required to be consult during the process of public consultation. EIA / IEE Regulations 2000 also give guideline for public participation of schedule II projects. An advertisement is published in to leading newspaper for comments of public hearing is conducted on any public place where each stakeholder is heard by the representative of Director General of EPA Punjab. Proper remedial measures / action is taken by EIA section on the reservation of stakeholders. Prior to this the consultant prepare the social impact of the project in the light of opinion of the people of the project area and accommodated in EIA study.

Occupational Health

Construction and operational activities could affect the occupational health of the workers. Quantitative national standards with respect to the above aspect are yet to be developed in Pakistan. However, guidance in qualitative terms can be obtained from the Pakistan Factories Rules, 1962 (based on the Factories Act, 1934) and the labour Law (amended) Ordinance, 1972 and ILO guidelines.

Toxic and Hazardous Waste

Section 14 of the PEPA Act, 1997 (amended 2012), prohibits the handling trade, collection and storage of hazardous substances. Hazardous substances rules have been formulated in this regard but they are still on the status of draft and available on the web site of EPD and Pak EPD. Protection of the environment with regards to toxic and hazardous waste to also covered by the Pakistan Penal Code (PPC), 1860. Environment Protection Department, Punjab is mandated to monitor the transportation of hazardous materials within the provincial limits.

Punjab Hospital Waste Management Rules, 2014

According to this rule all hospitals, clinics, laboratories, dispensaries, pharmacies, nursing homes, blood banks, autopsy centers, mortuaries, medical research institutes and veterinary institution are strictly follow Punjab Hospital Waste Management Rules, 2014 for the environmentally safe-disposal of infectious and hazardous waste. Pakistan Environmental Protection Act, 1997 and Hospital Waste Management Rules, 2014 strictly prohibits unsafe disposal of all types of risk / hazardous waste in hospital. It binds the hospital for formation of hospital management committee and designates the responsible persons for each duty for collection storage and disposal of the risk waste. The safe storage and incineration of the risk waste is mandatory under these rules.

The salient features of the Punjab Hospital Waste Management Rule, 2014 are given below:

Waste Segregation

Risk Waste (yellow bags) shall be separated from non-risk (white bags) waste.

The disposal of medical waste including infusion bags, the risk waste e.g. chemical waste shall be placed in a suitable yellow coloured container made of metal and labelled with sign “Danger! Contaminated Sharps.

The yellow waste bags shall be labelled with time, date, point of production and description of waste and these bags shall be removed when 3rd quarter of these are filled.

Waste Storage
All risk waste should be collected in a separate, totally enclosed and secure central storage located close to the incinerator and large enough to contain all risk waste produced by the hospital which should be easy to clean and disinfect and most importantly easily accessible for the collection vehicles and concerned staff.

Waste Disposal
Waste shall be inactivated or rendered safe before their final disposal by suitable thermal, chemical incineration or other treatment methods depending on its nature / type of the waste material.
Effluent shall be tested to ensure that it confirms the Environmental Quality Standards before its final disposal. The method of disposal shall be operated by hospital after its EIA approval. Risk waste shall be incinerated within 24 hours of its delivery to incinerator. The landfill shall be located with minimal risk of pollution of groundwater and rivers. The landfill should be regular monitored by the local council and daily collection of risk waste shall be taken by the vehicles of the local council.

Committee
Provincial Committee
The provincial committee comprising of;
Secretary Environment (Chairperson)
Members of the Committee includes:
Secretary Health Department, Nominees of the local Govt. Department, Representative of Medical Association, Representative of Medical University in the Province, Representative of Private Hospital Association and DG EPA.
The committee shall monitor the periodically review of implementation of the rules and recommended adaption of such policy measures, plans and projects as it may necessary for the effective management of hospital waste in the province.

Divisional Committee
Divisional Commissioner (Chairperson)

Members of the Committee are;
EDOs Health, Representative of PMA, Medical Superintendent of District Headquarter Hospital, Representative of Private Hospital Association, Representative of two NGOs working in health sector and District Officer, Environment.
The Divisional Hospital Waste supervisory committee shall monitor the periodically review of implementation of the rules and recommended adaptation of such policy measures, plans and projects in all Districts of Division as it may necessary for the effective management of Hospital Waste in the Division.

(7)
ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

7.0 GENERAL

This is part of the study discusses the Environmental Management Plan and describes institutional arrangements required for its effective implementation. An Environmental Management Plan renders a delivery mechanism to reduce adverse environmental impacts of a project during its execution, enhance project benefits, and introduce standards of good practices to be adopted for all project works.

It is estimated that about 50% of all lubricants are released into the environment. Common disposal methods include recycling, burning, landfill and discharge into water, though typically disposal in landfill and discharge into water are strictly regulated in most countries, as even small amount of lubricant can contaminate a large amount of water. Most regulations permit a threshold level of lubricant that may be present in waste streams and companies spend hundreds of millions of dollars annually in treating their waste waters to get to acceptable levels.

Burning the lubricant as fuel, typically to generate electricity, is also governed by regulations mainly on account of the relatively high level of additives present. Burning generates both airborne pollutants and ash rich in toxic materials, mainly heavy metal compounds. Thus lubricant burning takes place in specialized facilities that have incorporated special scrubbers to remove airborne pollutants and have access to landfill sites with permits to handle the toxic ash.

Unfortunately, most lubricant that ends up directly in the environment is due to the general public discharging it onto the ground, into drains, and directly into landfills as trash. Other direct contamination sources include runoff from roadways, accidental spillages, natural or man-made disasters, and pipeline leakages.

Improvement in filtration technologies and processes has now made recycling a viable option (with the rising price of base stock and crude oil). Typically various filtration systems remove particulates, additives, and oxidation products and recover the base oil. The oil may get refined during the process. This base oil is then treated much the same as virgin base oil however there is considerable reluctance to use recycled oils as they are generally considered inferior. Basestock fractionally vacuum distilled from used lubricants has superior properties to all-natural oils, but cost-effectiveness depends on many factors. Used lubricant may also be used as refinery feedstock to become part of crude oil. Again, there is considerable reluctance to this use as the

additives, soot, and wear metals will seriously poison/deactivate the critical catalysts in the process. Cost prohibits carrying out both filtration (soot, additives removal) and re-refining (distilling, isomerization, hydrocrack, etc.) however the primary hindrance to recycling still remains the collection of fluids as refineries need continuous supply in amounts measured in cisterns, rail tanks.

Occasionally, unused lubricant requires disposal. The best course of action in such situations is to return it to the manufacturer where it can be processed as a part of fresh batches.

Environment: Lubricants both fresh and used can cause considerable damage to the environment mainly due to their high potential of serious water pollution. Further, the additives typically contained in lubricant can be toxic to flora and fauna. In used fluids, the oxidation products can be toxic as well. Lubricant persistence in the environment largely depends upon the base fluid, however if very toxic additives are used they may negatively affect the persistence. Lanolin lubricants are non-toxic making them the environmental alternative which is safe for both users and the environment

7.1 PURPOSE OF ENVIRONMENTAL MITIGATION

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

1. **What is the problem?**

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

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

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

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

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

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

Problem can be addressed by using environmental friendly practices. Such practices can be followed by following mitigation plan.

Table 2: EMP for construction phase

Environmental aspects	Environmental Impacts of the Activity	Proposed Mitigation Measures	Responsibility
CONSTRUCTION PHASE			
Noise		In order to avoid the nuisance of noise the project maintenance manager shall ensure the all vehicles, equipment, machineries used during construction phase are in good working condition.	Project Manager
Water Pollution	Unplanned wastewater disposal may contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	Wastewater generation during construction phase shall be reused again for material making for construction phase and sprinkling of dust on soil. Domestic wastewater will not be there at the site because at site workers will use local/public washrooms	Project Manager
Air Emission	Generation of dust and particulate matters is an issue that could arise due to construction activities. Gaseous emissions including SOx, NOx, CO2, lead and CO during construction phase. These gases are ozone depleting reagents. Besides, they also pose threat to human health.	The construction materials e.g. soil, clay would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation would be done. The workers would be provided safety gloves, masks and ear buds and wherever necessary goggles to avoid health complications. Good quality fuel shall be used in the machineries, generators to avoid	Project Manager

		emission. Vehicles, machineries with good conditions which fall on the quality standards shall be used to control the exhaust emission.	
Solid Waste	Unplanned dumping of solid waste generation during construction phase can lead to blockage of roads, waterways and also create unaesthetic sight of the proposed location.	Solid waste generated during construction phase shall be reused in construction activities rather than dumping. The solid waste during construction phase will consist most of soil, packaging materials, plastic bags, iron rods, and food leftovers. The organic portion of solid waste shall be collected by local sanitary workers while other material will be reused in the construction activities.	Project Manager
Health & safety	Unskilled workers may create issues in attaining the overall health environment and safety policy.	Regular onsite and offsite training of the workers shall be conducted. Impromptu meetings and discussions with the site in-charge and daily wages workers will be done to resolve any issues that may create health safety and environmental problems during construction phase.	Project Manager
Emergency Response	Accidents and / or emergency breakdown of the equipment/machineries/vehicles involved may create environmental, health and safety hazards.	This situation can be avoided by regular maintenance of the vehicles for quality assurance. Each equipment will be checked prior to operation to avoid accidents and human health danger due to such accidents.	Project Manager

Table 3: EMP for Operation Phase

Sr. No	Environmental aspects	Environmental Impacts of the Activity	Proposed Mitigation Measures	Responsibility
OPERATIONAL PHASE				
1.	Noise	In the project of storage, during loading and unloading noise may be generated.	_Workers should be told and encouraged to use PPE's (ear plugs or ear muffs).	Project Manager
2.	Water Pollution	At the project site, there will be no wastewater generation during operational activity; there will be only domestic wastewater.	_There will be no industrial activity so on wastewater will be generated only the domesticated waste water which will be treated by passing through septic tanks and finally discharged in local drain _Efforts should be made to ensure that water is conserved and that environment-friendly techniques are adopted too.	Project Manager
3.	Air Emission	Source of air pollution during operation phase would only be dust generated	_Proper ventilation can limit the amount of indoor pollutants. _Water spraying should be practiced where required. _Regular monitoring _No waste should be burnt at the premises. _Gas detectors will be installed for LPG leakage detection _Generators will be properly tuned and maintained and proper enclosure will be provided.	Project Manager
4.	Solid Waste	Solid waste comprise of a domestic waste and waste scrap mainly	_No waste should be burnt within the premises _Small waste storage bins should be installed.	Project Manager

		which would be sold to their respective dealers.		
5.	Health & Safety	Operation of the project may cause some concerns for safety, public health and nuisances within the project area.	_ Providing Personal Protection Equipment (PPEs) such as gloves, masks to the workers. _ Basis medical training should be provided to the specified work staff and basis medical service and suppliers to workers.	Project Manager
6.	Emergency Response	Fire hazard	_ Fire extinguishers should be properly maintained and checked periodically. _Prohibiting flammable materials in the premises. _ Maintaining fire alarm systems for detection and warning of fire. _ Adequate training of workers on use of firefighting system to deal with the situation. _ Gas leakage will be controlled by providing gas detection system _ Safety plan in case of gas leakage will be followed	Project Manager

7.2 ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the environmental management plan in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions.

Table 4: Environmental Monitoring Plan for construction phase

Components	Objective of Monitoring	Parameter to be Monitored	Measurement	Frequency	Location	Responsibility
Noise Levels	To determine the effectiveness of the noise abatement measures on the sound level	Noise level on the site and adjacent area on dB(A) scale	Noise level reading will be taken	Twice during construction	At least two locations on the unit boundary	Environment Officer / Manager
Waste Collection, Storage and Disposal	To check the availability of Waste Management System and Implementation	Inspection of Waste Generation, collection, Storage and Disposal at site	Visual inspection	Once daily	Construction site	Environment Officer / Manager
Soil contamination	To determine the effectiveness of the control measures taken to minimize the spillage of oil and chemicals	Inspection of equipment and vehicles	Visual inspection and availability checks	Monthly inspection	All vehicles and equipment in use at construction site	Contractor / Environmental officer
Workers safety	To check and evaluate the effectiveness of the workers' safety plan	Injuries and accidents	Recording injuries	Daily	Onsite	HSE officer / contractor
Water conservation	To determine the effectiveness of the Water Conservation Techniques in Practice	Leakages, spills and wastages	Visual inspection and record tracking	On monthly basis	At all points of use	Environmental officer / manager

The monitoring of the EMP and the communication and documentation mechanism that will be employed during the operational phase will be based on the Environmental Management System (EMP) of the project proponents and the certification and legal bindings. The management system of the project proponents will be the same as the certified EMS in place at the company. Approximately 50,000 PKR budget will be reserved for the Environmental Monitoring and Measures.

Table 5: Environmental Monitoring Plan for Operation Phase

Components	Objective of Monitoring	Parameter to be Monitored	Measurement	Frequency	Location	Responsibility
Noise level (dB)	To check whether the existing noise control measures are able to bring the sound level within prescribed limits	Noise level near the receptor	Noise Measurement	Annually	At least two locations on the plant boundary	Environment officer
Waste disposal, procedure for waste collection, storage, and disposal	To check the availability of waste management system and implementation	Inspection of waste generation, collection, storage, and disposal will be undertaken at each site of the project activity	Visual inspection	Once daily	Entire unit	Administration Officer
Safety	To check and evaluate the effectiveness of the workers' safety plan and availability and access of First Aid facilities	Injuries	Injuries will be recorded	Daily	Entire unit	Administrator

7.3 INSTITUTIONAL CAPACITY OF THE UNIT

The organizational structure for the Environment Management Plan is outlined below:

7.3.1 PRIMARY RESPONSIBILITIES

The primary responsibility for implementing EMP within the company lies with the owner of project

7.3.2 OPERATION MANAGEMENT & CONTROL

Conducting the operational activities in environmentally sound manner will be the responsibility of the concerned Manager; for which he will be trained.

7.3.3 SUPERVISION & MONITORING

Senior supervisor will be responsible for all environmental issues and for the implementation of EMP.

7.3.4 COMMUNICATIONS AND DOCUMENTATION

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

7.3.4.1 MEETINGS

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meeting will be present the EMP to project staff and discuss its implementation and to discuss any event of environmental significance that has happened in the under-discussion industry or a similar industrial unit to investigate its route causes and develop its solutions.

The purpose of the weekly meetings will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of weekly environmental report.

7.3.4.2 CHANGES-RECORD REGISTER

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

7.4 ENVIRONMENTAL TRAINING

Training is an integral part of a preventive strategy. Environmental and disaster management training will be required to ensure proper implementation of effective environmental management and monitoring plan; and disaster management plan. However, training could be organized by Owner involving relevant staff. As a trainer, competent Consultant can be outsourced. Important training under the spectrum needs to include:

- Training on firefighting and safety management;
- Training on environmental safeguards and compliance;
- Staff training on environmental monitoring and reporting;
- Training on occupational health and safety measure.

7.5 SUMMARY OF IMPACTS AND THEIR MITIGATION MEASURES

Environmental monitoring is a component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the Environmental Management Plan in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions. The main objectives of the environmental monitoring are:

- To provide a mechanism to determine whether the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance and therefore, require corrective actions.
- To document the actual project impacts on physical, biological, and socio-economic receptors, quantitatively where possible, in order to design better and more effective mitigation measures.

7.6 EQUIPMENT MAINTENANCE DETAILS

Complete inspection and maintenance of tanks, vents and all other auxiliaries will be done by 3rd party as and when required. Maintenance plan for firefighting equipment is as follows:

Task	Weekly	Monthly	Semi-Annually	annually

Visual Inspection	✓		
Testing and Inspection		✓	
Check for Leakage	✓		
Recharging			✓
Fire Mains & Nozzles	✓		
Containers/Gallons		✓	
Control and section valves		✓	

7.7 ENVIRONMENTAL BUDGET

Approximately PKR 50,000 budget will be reserved for the Environmental Monitoring and Measures.

7.8 CHANGE MANAGEMENT PLAN

The EIA/IEE recognizes that changes in the operations or the EMP may be required during the operation and therefore a Change Management Plan has been provided to manage such changes. The management of changes is discussed under two separate headings, changes to the EMP and changes to the Operation.

7.9 CHANGING IN PLANNING AND DESIGN

The change management system recognizes three orders of changes.

I. First Order Change

A first order change is one that leads to a significant departure from the project described or the impacts assessed in the EIA/IEE and consequently require a reassessment of the environmental impacts associated with change. Examples of such change include change in location of the proposed plan.

In such an instance, the environmental impacts of the proposed change will be reassessed, and the results sent to the Punjab EPA for approval.

II. Second Order Change

A second-order change is one that entails project activities not significantly different from those described in the EIA/IEE, and which may result in project impacts whose overall magnitude would be similar to the assessment made in this report. In case of such changes, the environmental impact of the activity will be reassessed, additional mitigation measures specified if necessary, and the changes reported to the Punjab EPA.

III. **Third Order Change**

A third-order change is one that is of little consequence to the EIA/IEE findings. This type of change does not result in impact levels exceeding those already assessed in the EIA/IEE; rather these may be made onsite to minimize the impact of an activity. The only action required in this case will be to record the change in the change record register.

7.10 CHANGING IN MONITORING AND MANAGEMENT PRACTICES

The EIA and the EMP have been developed based on the best possible information available at the time of the EIA/IEE study. However, it is possible that during the construction and operation phase some aspects of the EMP may need to be changed owing to their non-applicability in a certain area of operation or the need for additional mitigation measures based on the findings of environmental monitoring during the construction and operation phase. In such cases following actions shall be taken.

1. A meeting will be held between management and the concerned contractor. During the meeting the proposed deviation from the EMP, planning and designing will be discussed and agreed upon by all parties
2. Based on the discussion during the meeting, a change report will be produced collectively, which will include the original EMP clause/plan or design, the change that has been agreed upon, and the reasons for the change
3. The report will be signed by all the parties and will be filled at the site office. A copy of the report will be sent to Housing Scheme and contractor head offices.
4. All relevant project personnel will be informed of the change.

7.11 COMPENSATION IN TERMS OF MONEY

Changes in the EMP can be done upto 3% of the total development cost in case the Monitoring of the environment according to the prescribed plan does not render useful.

(8)

STAKEHOLDERS PARTICIPATION

The project proponent engaged an Environmental Expert Team who conducted a survey of the project site and had discussions with stakeholders and consult with the local people to evaluate the project socioeconomic impacts. People provide the massive information about the project and have positive remarks regarding the project development.

8.1 Methodology of Consultation

The team carried out public consultation at various locations around the Project Site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project Area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring factory workers, residents, shopkeepers, drivers etc.
- Environmental consultations and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Consultation was held with following:

8.1.1 Proponent

Possible impacts and mitigation measures related to the subject project were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environmental friendly.

8.1.2 The Responsible Authority

Management of the subject project is the responsible authority to take all measures prior to the activity.

8.1.3 Some other Departments & Agencies

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

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons. Socioeconomic survey form are annexed.

8.2 Affected & Wider Community

There is no affected community present in the radius of our study area. Team has consulted with the inhabitants of the different villages. They provided positive remarks regarding the subject project and in the favor of the subject activities for the proposed project. Stakeholders participation performer's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socioeconomic impact.

(9)
CONCLUSION AND RECOMMENDATIONS

9.1CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the Proposed Construction of **"Lube Oil Reclamation & Blending Plant and storage by M/s SUN TECH LUBRICANTS".**

EIA of Proposed Project is performed according to guidelines of EPA. It includes description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study.

The performed EIA showed all anticipated impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are within acceptable limits. Moreover, no deterioration, depletion or exploitation of resources is expected to be caused by this project.

Based on overall assessment of the environmental impact of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented.

It is accordingly recommended that Environmental Approval for the project may be issued by the Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

9.2RECOMMENDATIONS

The Environmental Impact Assessment study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, ear muffs, mufflers, goggles, gloves and shoes etc. should be provided to workers
- Train workers to use PPEs
- Advise workers to follow SOPs.
- Installation of fire extinguishers in the premises and their monitoring must be ensured.

- Equipment maintenance and efficiency must be checked.
- No compromise no public health and environment should be allowed.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Wages should be distributed on time.
- Proper tree plantation plan should also be developed in order to make the unit environment friendly.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- Proper dispensary and First Aid Box should be provided for workers
- Smoking should be avoided within premises of project site and near fuel storage areas.
- The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and police for urgent support.
- The proposed Environmental Management & Monitoring Plan should be implemented.

LIST OF GLOSSARY

Mitigation	The action of Lessing in severity or intensity
Evaluated	Estimated or determine the nature, value, quality, ability, extent
Legislation	Law entitled by a legislative body
Discrepancies	A difference between conflicting facts, claims or opinion
Aspects	A distinct feature or element in a problem
Compliance	Acting according to certain accepted standards
Flora	All the plants life in a specific region
Fauna	All the animal life in a specific region
Demarcated	Separate clearly, as if a boundaries
Screening	The display of a motion picture
Substitutions	An event in which one thing is substituted for another
Regulation	An authoritative rule
Stakeholder	A person or organization with a interest
Vulnerable	Susceptible to attack
Annunciation	A formal public statement

Abbreviations

Acronym	Full Text
BHU	Basic Health Unit
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
dB	Decibel
DHQH	District Headquarters Hospital
ESRMP	Environmental, Social & Risk Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA-Pb	Environmental Protection Agency, Punjab
EPD	Environment Protection Department
ERS	Emergency Response System
ESH	Environmental Safety and Health
ESHU	Environmental Safety and Health Unit
GoPb	Government of the Punjab
GoPk	Government of Pakistan
IEE	Initial Environmental Examination
IEE	Initial Environmental Examination Report
IWT	Indus Water Treaty
JICA	Japan International Cooperation Agency
MCH	Mother and Child Healthcare Centre
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
Pak EPA	Pakistan Environmental Protection Agency
PEPA	Punjab Environmental Protection Act
PM	Particulate Matter
PSDP	Public Sector Development Programme
RHC	Rural Health Centre
SHC	Sub Health Centre
SPM	Suspended Particulate Matter
SW	Solid Waste(s)
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UBC	Uniform Building Code
WAPDA	Water and Power Development Authority
WHO	World Health Organization