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EXECUTIVE SUMMARY

This Environmental Impact Assessment (EIA) report presents a comprehensive overview of the key environmental and social considerations related to the proposed, M/s **CRG International**, located at Khewat No.12, Khatooni No. 68 to 96, Muraba No, 57 Killa No. 18, Mouza Dheerda, Tehsil & District Sheikhupura, spanning a total area of 14138 Sft.

The project aims to safely store, handle, and distribute Liquefied Petroleum through a properly designed facility equipped with storage tanks, filling and bowser sheds, and safety infrastructure. It aims to ensure a reliable PETROLEUM supply, operational efficiency, and full compliance with environmental and safety regulations.

In accordance with the Punjab Environmental Protection Act and the Review of IEE & EIA Regulations, 2022, the project falls under Schedule II (list of projects requiring an EIA), Category A (Energy), Sub sector 5 (Oil and gas extraction projects including exploration, production, gathering systems, separation and storage). As such, the preparation and submission of an EIA is mandatory to obtain the required Environmental Approval from the relevant authorities.

This report evaluates the potential environmental and social impacts of the project across its entire lifecycle. Key areas of focus include land use, water and air quality, solid waste management, traffic patterns, noise levels, and the socio-economic well-being of nearby communities. The findings are supported by field data, stakeholder consultations, and technical analysis.

To address potential adverse impacts, a range of mitigation and management measures have been proposed, aimed at minimizing harm to the environment and surrounding population. These include best practices in construction management, pollution control, and community engagement.

Further technical details and a full description of the project, including planning and construction methodology, are provided in Chapter 03: Project Detail.

Brief of Project

Table 1 Brief of Project

I.	Title of Project	CRG International
II.	Location of Project	Khata No. 123/123, Khatooni No. 895 to 900, Mouza Bandur, Tehsil and District Rahim Yar Khan
III.	Area of Project	14138 Sft
IV.	GPS Coordinates	31.7109632N,74.0109872 E
V.	Current Status of Project	Proposed Project
VI.	Cost of Project	66 million PKR
VII.	Storage Product	Petroleum storage
VIII.	Storage Capacity	Storage: 4550 Ltr
IX.	Proponent of Project	Chaudhry Rehan Ghaus
X.	Purpose of Project	To meet the growing domestic and commercial energy demand by providing a reliable supply of Petroleum
XI.	Description of Project	This proposed project is a fuel storage facility comprising underground storage tanks, a filling shed, a bowser shed, and associated utility structures. The site includes a parking, and circulation space designed for safe handling, transfer, and distribution of Petroleum products while ensuring

		environmental protection and operational efficiency.
XII.	Cutting of Trees	There will be no cutting of trees. After construction trees will be planted
XIII.	Water Usage	5-8 liter per day of water will be used for drinking purpose
XIV.	Manpower	20-25 person during construction and 25-35 permanent maintenance staff
XV.	Period of construction	05-06 months
XVI.	Assessed environmental issues	Air quality impacts from fugitive gas emissions, fire and explosion risks due to accidental leaks, and noise pollution from filling operations and vehicle movement. There is also a risk of soil and water contamination in case of spills, along with minor solid waste generation from packaging and maintenance activities.
XVII.	Wastewater generation	Only domestic wastewater will be produced
XVIII.	Wastewater management/ disposal	After treatment in septic tanks, it will be disposed of in the sewerage system
XIX.	Rainwater Harvesting Plan	Infiltration trenches and storage tanks will be installed for RWH, detail in given under Heading 9 (RHW)
XX.	Control measures	Installing leak detection and emergency shut-off systems to prevent and control gas emissions, along with maintaining strict fire safety protocols such as firefighting

		equipment and trained personnel. Noise control measures and proper scheduling will minimize disturbance, while impervious flooring and spill containment systems will prevent soil and water contamination. Safe waste handling and disposal practices will be adopted
XXI.	Protected Areas	As per field visits and consultations with wildlife and forest departments, the proposed project area **does not fall** in any protected area i.e. National Parks, Wildlife Sanctuaries, or Forest areas, etc.
XXII.	Compliance	In accordance with Punjab Environmental Protection Act & IEE/EIA Regulations 2022

Legal and Administrative Framework

These include the National Conservation Strategy (1992), National Environmental Policy (2005), Pakistan Labor Policy (2010), and the Punjab Environmental Protection Act (PEPA 1997), along with its subsequent amendment in 2012. Additionally, the project ensures compliance with the Punjab Environmental Quality Standards (PEQS), the Land Acquisition Act (1894), the Prohibition of Cutting of Trees Act (1975), the Punjab Wildlife Act (1974), the Punjab Plantation and Maintenance of Trees Act (1974), and the Antiquities Act (1975).

A thorough review of environmental documents has been conducted, underscoring the mandatory submission of an environmental assessment study report as required by the Pakistan Environmental Protection Ordinance (PEPO), 1983, and reinforced by the Pakistan Environmental Protection Act (1997). Specifically, Section 12(1) of the

amended PEPA (2012) stipulates that any project involving the construction or modification of the physical environment must conduct an Environmental Impact Assessment (EIA) or an Initial Environmental Examination (IEE) and obtain approval (NOC) from the relevant provincial environmental authority.

In the preparation of the Environmental Impact Assessment (EIA) report for Proposed project, full consideration has been given to the PEPA (1997), the Punjab Environmental Protection (Amendment) Act (2012), and all other applicable legal requirements from both the Pakistan and Punjab governments, including the Land Acquisition Act (1894).

Assessment of Major Impacts

During Construction Phase

The construction phase of the Proposed project will involve significant land development and infrastructure activities, which are likely to result in several environmental impacts. These impacts will primarily include soil erosion, dust generation, noise pollution, and disruption of local ecosystems. Soil erosion may occur due to excavation and land grading, particularly during heavy rainfall, which can lead to sedimentation of nearby water bodies. The generation of dust during construction activities can have adverse effects on air quality, leading to health issues for workers and the surrounding community. Noise pollution from machinery and construction activities will likely impact both the local community and wildlife in the vicinity, especially during nighttime construction. Additionally, the project may disrupt local wildlife habitats, potentially leading to displacement of species, especially if there are areas of natural vegetation or wetland ecosystems within the project site.

During Operational Phase

Once operational, the proposed project will generate a different set of environmental impacts primarily related to air emissions, energy use, waste management, and increased traffic movement of PETROLEUM bowsers. During storage and filling operations, there is a potential risk of fugitive PETROLEUM emissions, which may affect local air quality if not properly controlled. The unit will consume energy for pumps,

compressors, and safety systems, contributing to indirect emissions if sourced from non-renewable electricity. Minor solid waste, such as packaging material and maintenance residues, will require proper handling and disposal to prevent soil contamination. Additionally, vehicular traffic for PETROLEUM transportation may increase emissions of greenhouse gases and pollutants, as well as cause noise and traffic congestion in surrounding areas. Strict safety and environmental management measures will be essential to minimize risks during this phase.

Proposed Mitigation Measures

Mitigation Measures During Construction Phase

- **Dust Control:** Water sprinkling on unpaved roads, construction sites, and material stockpiles will be carried out regularly to suppress dust. Construction materials such as sand and cement will be stored in covered areas or containers.
- **Noise Reduction:** Use of well-maintained and quieter machinery, along with limiting high-noise activities to daytime hours, will help reduce the impact on nearby communities and wildlife. Workers will be provided with protective hearing equipment where needed.
- **Erosion and Sediment Control:** Proper grading, construction of drainage channels, and installation of silt fences will help manage stormwater runoff and reduce soil erosion during excavation and site leveling.
- **Waste Management:** Construction waste will be segregated and disposed of by EPA approved vendor. Recyclable materials such as metal, wood, and concrete will be separated and reused where possible.
- **Protection of Flora and Fauna:** Vegetation clearance will be minimized, and native plants will be preserved where feasible. Construction zones will be clearly marked to avoid encroachment into ecologically sensitive areas.
- **Health and Safety:** Workers will be provided with safety gear and training. On-site medical aid and emergency response protocols will be established.

- **Traffic Management:** A traffic management plan will be implemented to control heavy vehicle movement and reduce inconvenience to local traffic, especially near residential areas.

Mitigation Measures During Operational Phase

- **Solid Waste Management:** A proper waste collection and disposal system will be established.
- **Sewage and Wastewater Treatment:** A treatment unit (Septic Tank) will be installed to treat wastewater before its safe discharge or reuse, thereby protecting groundwater and surface water bodies.
- **Water Conservation:** Water-efficient fixtures will be installed, and public awareness campaigns will promote water-saving practices among residents. Rainwater harvesting systems may also be integrated.
- **Energy Efficiency:** Buildings will be designed with energy-efficient lighting, insulation, and ventilation. Solar panels or other renewable energy sources may be used to reduce dependency on the national grid.
- **Green Landscaping:** Native and drought-resistant plant species will be used in landscaping to reduce water use and enhance biodiversity. Green belts and parks will be maintained to improve air quality.
- **Traffic and Transportation:** Road infrastructure will be developed with dedicated pedestrian walkways and cycling lanes. Encouragement of public transport usage and smart traffic systems will help reduce emissions.
- **Environmental Monitoring:** Regular monitoring of air, water, and noise levels will be carried out to ensure compliance with environmental standards. An environmental management plan (EMP) will guide sustainable practices throughout the project's life.

Proposed Monitoring Framework

Given the requirement for an Environmental Impact Assessment (EIA) due to the potential long-term, significant, or adverse environmental impacts associated with the PETROLEUM storage and filling unit, it is essential to implement a comprehensive

Environmental Monitoring Program. This program will systematically monitor key environmental parameters throughout all phases of the project—planning, construction, and post-construction to ensure full compliance with the Punjab Environmental Quality Standards (PEQS) and other applicable legal requirements.

The Environmental Management and Monitoring Plan serves as a strategic tool to minimize potential negative environmental effects during the development and operational stages of the PETROLEUM storage and filling unit. It also seeks to enhance the overall project value by enforcing high standards for health, safety, and environmental protection.

The project proponent is fully committed to implementing all proposed mitigation measures during the land development, construction, and habitation phases. Environmental monitoring is a core element of this commitment and will be conducted regularly to assess compliance and performance. The specific details of the monitoring approach and frequency are provided in Chapter 08 of the report.

Conclusions and Recommendations

The proposed PETROLEUM storage and filling unit is expected to generate significant positive impacts, particularly by creating employment opportunities, enhancing fuel supply reliability, and supporting local commercial and domestic energy needs. The project will contribute to economic growth, improved business activities, and upliftment of the socioeconomic conditions of the surrounding community.

While some minor to moderate environmental risks may arise during the operational phase such as fugitive gas emissions, noise from filling operations, increased vehicular traffic, and potential fire or safety hazards, these impacts are considered manageable with proper safety and environmental controls.

The recommended mitigation measures, including leak detection systems, firefighting infrastructure, proper waste handling, and traffic management, are practical and cost-effective to minimize any negative effects.

To ensure the environmental and operational sustainability of the PETROLEUM unit, a robust Environmental Management Plan (EMP) with monitoring and safety protocols has been proposed.

It is strongly recommended that the project proponent obtains all necessary regulatory approvals and licenses, including the Initial Environmental Examination (IEE)/Environmental Impact Assessment (EIA) clearance and No Objection Certificate (NOC) from the Punjab Environmental Protection Agency (Punjab EPA) and safety approvals from OGRA and Civil Defense prior to construction and operation, ensuring full compliance with applicable laws and standards.

1 INTRODUCTION

1.1 General

The rapid rise in petroleum demand across Pakistan now at approximately 41.9 kbpd (thousand barrels per day) in 2023, up from just 14.9 kbpd average since 1980 highlights the urgent necessity for new petroleum storage and filling units. the installation of petroleum storage and filling units in Pakistan has become increasingly necessary due to the growing demand for clean, reliable, and affordable energy. petroleum serves as an important alternative in areas where piped natural gas is unavailable, helping to reduce dependency on traditional fuels like wood and coal, which contribute to deforestation and indoor air pollution. Economically, Petroleum units stimulate local business activities, create employment opportunities, and support both domestic production and imports, contributing to energy sector growth. Environmentally, Petroleum is a cleaner-burning fuel that produces fewer pollutants compared to biomass and coal, helping to reduce greenhouse gas emissions and improve local air quality while aligning with national efforts to promote sustainable energy solutions.

Given its scale and potential impact, an Environmental Impact Assessment (EIA) is being undertaken to assess and address any environmental and social concerns, in compliance with the Punjab Environmental Protection Act and IEE/EIA Regulations 2022.

1.2 Purpose of the Report

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

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

The EIA report is comprehensive, covering socio-economic, physical, and environmental aspects, including land use, forestry, crops, water bodies, biodiversity (flora and fauna), heritage, and other factors relevant to the project and its surrounding area. It meticulously details mitigation strategies intended to address and neutralize potential environmental impacts on human and environmental health in the vicinity of the project site. These strategies are applicable during both the construction phase and the regular operation of the project.

Moreover, the report serves as a crucial document for decision-makers, particularly the EPA of Punjab, providing all necessary information in the officially approved format. This facilitates an informed decision-making process regarding the issuance of the required environmental approval. Through this report, the proponent demonstrates a commitment to adhering to the Punjab Environment Quality Standards (PEQS) and maintaining a robust environmental management order throughout the lifecycle of the project.

1.3 Identification of the project and proponent

The detail of the project and proponent is given below:

Name of project	**CRG International**
Location of project	Khata No. 123/123, Khatooni No. 895 to 900, Mouza Bandur, Tehsil and District Rahim Yar Khan
Proponent name	Mr. Chaudhry Rehan Ghaus
Address of proponent	R/O House # 50 St # 11, Phase 5 Defence Housing Authority Lahore Cantt
CNIC	35201-1678080-9

1.4 Nature, Size and Location of Project

CRG International is a proposed PETROLEUM storage and filling unit planned over a total area of 14138 Sft, located at Khewat No.12, Khatooni No. 68 to 96, Muraba No, 57 Killa No. 18, Mouza Dheerda, Tehsil & District Sheikhupura. The project site lies in a semi-urban, rapidly developing area with increasing energy demand for domestic, commercial, and industrial uses. The facility will include filling shed, bowser parking, safety infrastructure, and associated utilities to ensure safe and efficient operations. Its strategic location will enhance local energy accessibility, support regional economic activities, and contribute to sustainable development by providing a cleaner and more reliable fuel alternative. Below is the detail of area:

Sr. #	**Description of area**	**Area in Kanal**
1)	Tank Impounding & Storage Area	2.75
2)	Bowser Shed	1.00
3)	Filling Shed	0.75
4)	Parking Area	3.50
5)	Office Block & Utility Room	0.50
6)	Open Space/ Buffer Zone	3.59


M/S CRG INTERNATIONAL
Khewat No.12, Khatooni No. 68 to 96, Muraba No, 57 Killa No. 18,
Mouza Dheerda, Tehsil & District Sheikhupura
Hospital Rd
Best Holidays Inn
CFC SHEIKHUPURA
Iqbal Park
Iqbal Park Rd
Pizzarium Sheikhupura
Government Quarters
Jinnah Park Sheikhupura
Habib Bank Limited
Stadium Chowk
(civil quarters side)
Jalandhari Chatkhara
Stadium Rd
Khaki Jaan Rd
Sarwar Shaheed Rd
Ghous St
Yumm In Tumm
Haseeb Gym And Fitness
Khalid Rd
Tariq Road
Civil Quarters Rd
GGHS, No.2,
SHEIKHUPURA
Social Welfare
And Baitul Maal...
Ali Masjid Sheikhupura
Ameen
Homeopathic Clinic
Adiuvo Consultant SKP
SKP Studio
Qasim Architect &
Property Solutions
Gem Designer &
Layers
Google

1.5 Scope of the EIA Study, Area of Influence, and Magnitude of Efforts

The scope of this Environmental Impact Assessment (EIA) study covers all potential environmental, social, and safety impacts associated with the proposed CRG International storage and filling unit. It includes the assessment of impacts during construction, operation, and decommissioning phases, focusing on air quality, noise, soil and water resources, solid and liquid waste management, traffic impacts, occupational health and safety, and socio-economic conditions.

The area of influence extends beyond the project boundary to include the immediate surroundings that may be affected by vehicular movement, emissions, or accidental leaks, as well as nearby communities and sensitive receptors. It also considers regional impacts on local infrastructure, emergency response services, and economic activities.

The magnitude of efforts involves site inspections, stakeholder consultations, baseline environmental monitoring, risk assessment, and mitigation planning. Special emphasis has been placed on safety and environmental sustainability, in line with the Punjab Environmental Protection Act, OGRA PETROLEUM Rules, and national environmental quality standards.

2 POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 General Overview

The proposed project will be developed and operated in accordance with the national and provincial environmental policies, legal requirements, and regulatory frameworks governing PETROLEUM storage, handling, and distribution in Pakistan. The project aligns with the Pakistan Environmental Protection Act, 1997, and the Punjab Environmental Protection (Amendment) Act, 2012, which mandate environmental compliance through an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) approval from the Punjab Environmental Protection Agency (Punjab EPA).

Additionally, the project must comply with the Oil and Gas Regulatory Authority (OGRA) PETROLEUM Rules, 2001, which regulate the safety, licensing, and operational standards for PETROLEUM facilities. Relevant occupational health and safety provisions under the Factories Act, 1934, and fire safety requirements from Civil Defense and Rescue 1122 will also apply. Furthermore, the project adheres to the Punjab Environmental Quality Standards (PEQS) for air emissions, noise levels, and waste management to minimize environmental impacts.

2.2 Screening

CRG International, with a project area of 14138 Sft, falls under the following classification for environmental assessment Schedule II (list of projects requiring an EIA), Category A (Energy), Sub sector 5 (Oil and gas extraction projects including exploration, production, gathering systems, separation and storage).

In line with the Review of IEE & EIA Regulations, 2022, this classification mandates that the project must conduct an EIA for obtaining environmental approval from the Punjab Environmental Protection Agency (Punjab EPA). This ensures that the project is subject to appropriate regulatory oversight while not unduly burdening developers with excessive requirements.

2.3 Regulatory and Framework Compliance

The EIA study is guided by a range of legal, regulatory, and policy instruments that ensure environmental and planning compliance. These instruments collectively form a comprehensive framework that governs the environmental aspects of housing developments in Punjab.

2.4 Relevant Legal and Institutional Framework

2.4.1 Punjab Environmental Protection Act, 1997 (Amended 2012)

This Act is the cornerstone of environmental law in Punjab and mandates the preparation of an IEE/EIA for any project that could significantly impact the environment. It establishes the powers of the Punjab EPA to review, approve, and monitor environmental assessments, ensuring that development activities comply with environmental protection standards.

2.4.2 Review of IEE & EIA Regulations, 2022

These regulations under the Punjab Environmental Protection Act detail the procedures for the preparation, review, and approval of environmental reports. The regulations specify timelines, content requirements, and the classification of projects according to their potential environmental impact.

2.4.3 National Environmental Policy, 2005

The National Environmental Policy sets the overarching vision for environmental governance in Pakistan, promoting sustainable development across all sectors. It emphasizes the importance of integrating environmental considerations into the planning process and provides a framework for policy alignment at both federal and provincial levels. The housing sector must ensure that it aligns with this national policy, especially regarding urban planning, waste management, and resource conservation.

2.4.4 Punjab Local Government Act, 2022

This act defines the responsibilities of local governments in land development, waste management, municipal services, and infrastructure within urban settings. PETROLEUM

storage and filling units must coordinate with local government authorities to ensure proper planning, waste management, and service delivery.

2.4.5 OGRA PETROLEUM (Production & Distribution) Rules, 2001

These rules, issued by the Oil and Gas Regulatory Authority (OGRA), regulate the licensing, safety, storage, filling, and distribution of PETROLEUM . They mandate strict safety measures, periodic inspections, and technical standards for PETROLEUM storage tanks and filling operations.

2.4.6 Explosives Act, 1884

This law regulates the handling of explosive and highly flammable materials, including PETROLEUM . It requires specific safety precautions, secure storage, and government approvals for facilities handling combustible substances.

2.4.7 Civil Defense & Rescue 1122 Regulations

These require PETROLEUM facilities to have approved fire safety systems, emergency response plans, and firefighting equipment. Rescue 1122 conducts inspections to ensure readiness for fire and accident control.

2.4.8 Punjab Municipal Solid Waste Management Rules, 2022

These rules regulate the collection, storage, transportation, and disposal of solid waste in Punjab. PETROLEUM storage and filling units are required to establish waste management systems that comply with these rules, ensuring that the project does not contribute to environmental degradation through improper waste handling.

2.4.9 Punjab Water Act, 2019

The Punjab Water Act governs water resources, including the extraction of groundwater and the management of water systems. For PETROLEUM storage and filling units, it is crucial to ensure that water use is sustainable, that stormwater is managed effectively, and that any new water extraction activities do not deplete local aquifers.

2.4.10 Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974

This law is applicable if the PETROLEUM storage and filling unit is located near any protected or sensitive wildlife habitats. It governs the protection and management of biodiversity, including native plant and animal species. If the project area affects such habitats, appropriate mitigation measures will need to be implemented.

2.4.11 Forest Act, 1927

If the project site is located in or near forested areas, this Act requires that the developer obtain permission before clearing any forested land. It regulates deforestation activities and mandates the preservation of forest cover wherever possible.

2.4.12 Labor, Safety and Health Laws

These laws ensure the safety, health, and welfare of workers during construction activities. They set guidelines for workplace safety, worker health conditions, and risk management.

2.4.13 Public Consultation Guidelines, 1997

This guideline emphasizes the importance of early and inclusive public consultation with stakeholders, especially with communities living near the project site. It mandates that affected populations and municipal bodies are consulted before finalizing project plans, ensuring that the community's concerns are addressed.

2.4.14 Guidelines for Sensitive and Critical Areas

If the project site is located near sensitive or critical areas such as schools, hospitals, water bodies, wetlands, or areas of cultural heritage, these guidelines must be followed. They ensure that the project minimizes any adverse impacts on these sensitive environments.

2.5 Institutional Framework

The following institutions play key roles in regulating and overseeing environmental compliance for PETROLEUM storage and filling units in Punjab:

- **Punjab Environmental Protection Agency (Punjab EPA):** Enforces environmental laws, reviews and approves IEE/EIA reports, and ensures compliance with Punjab Environmental Quality Standards (PEQS) for emissions, noise, and waste management.
- **Oil and Gas Regulatory Authority (OGRA):** Regulates the licensing, safety, technical standards, and operational procedures for PETROLEUM storage, filling, and distribution facilities.
- **Civil Defense and Rescue 1122:** Oversees fire safety measures, emergency preparedness, and response systems to ensure public and worker safety in case of accidents or leaks.
- **District Administration and Municipal Committees:** Grant local approvals, monitor land use compliance, and ensure that the facility aligns with local governance and community requirements.
- **Punjab Local Government Board:** Supervises urban development aspects, including infrastructure and service provisions related to industrial and fuel storage projects.

3 SCOPING

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

3.1 Spatial and Temporal Boundaries of Environmental Assessment

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

3.2 Important Issues and Concerns Raised during Consultation

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

- Local should be preferred for the job opportunities
- Proper training should be given to workers
- Noisy activities should be confined
- Air pollution should be controlled effectively
- There should be careful handling of PETROLEUM storage devices
- Wastewater should not dispose of without proper treatment
- Solid waste must be collected timely
- Gas measurement devices should be used for continuous monitoring
- A proper wastewater treatment plant should be installed
- Ensure the tree plantation in the vicinity of area
- Health and safety of workers should be ensured
- EMMP should be designed and enforced with great spirit
- Respective team officers should be responsible for the implementation of management plan and actions
- Avoid the excessive use of groundwater. Limited amount of water should be use
- Cleanliness of area should be ensured
- To reduce or avoid air pollution transport vehicles should be covered in the construction phase
- Proponent shall work for betterment of community

3.3 Significant Impacts and Factors to be Determined

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

- Dust and Particulate emissions
- Wastewater generation and its treatment

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

4 Alternatives Consideration

The assessment for the proposed PETROLEUM storage and filling unit includes a detailed evaluation of project alternatives to ensure environmentally sustainable and socially responsible development. The alternatives have been examined with the intent to minimize adverse impacts while meeting the core objective of providing affordable and planned housing.

Alternative assessment plays a vital role in promoting more effective decision-making by identifying potential environmental and social implications at the earliest stage of planning. The alternatives considered encompass site selection, design and layout planning, environmental integration, and economic feasibility, with an emphasis on long-term sustainability and compliance with legal standards.

4.1 Site Alternatives

The proposed site for the PETROLEUM storage and filling unit was selected based on a combination of legal, geographic, and urban planning considerations. The land (14138 Sft) was earmarked for urban residential use and duly approved by the relevant Development Authority.

Alternative sites were not pursued for the following reasons:

- The selected plot lies within the municipal limits, compatible with land use zoning and regional master planning guidelines.
- Proximity to key infrastructure such as schools, hospitals, road networks, and public utilities supports integrated community living.
- The land is non-agricultural, free from any protected ecosystems, water bodies, or heritage sites, thus minimizing ecological and cultural disruption.

Given these locational benefits and regulatory compatibility, no alternate site was found to offer similar viability and alignment with planning regulations.

4.2 Design and Layout Alternatives

Various design alternatives were evaluated during the planning phase of the PETROLEUM storage and filling unit, focusing on operational efficiency, safety, environmental compatibility, and cost-effectiveness. The selected layout includes:

- Dedicated PETROLEUM storage tank area with an impounding wall, ensuring safe containment in case of accidental leaks or spills.
- Strategically located filling shed and bowser shed, allowing smooth vehicle circulation and efficient loading/unloading operations.
- Clearly defined parking, office, and utility areas to separate operational and administrative activities, enhancing safety and workflow.

Provision of open buffer zones and green areas to improve environmental quality and serve as safety setbacks in compliance with OGRA PETROLEUM Rules, 2001 and Punjab EPA guidelines.

4.3 Environmental Alternatives

During the planning of the PETROLEUM storage and filling unit, various environmental alternatives were considered to minimize potential impacts on air, soil, water, and nearby communities. These included:

- **Site Selection Alternatives:** Different locations were assessed to avoid ecologically sensitive areas, densely populated neighborhoods, and regions with groundwater vulnerability. The chosen site was selected for its safe distance from residential zones, accessibility to transportation routes, and minimal ecological sensitivity.
- **Technology and Equipment Alternatives:** Environmentally friendly and safer PETROLEUM storage tanks with modern leak detection systems, pressure relief valves, and fire suppression mechanisms were preferred over conventional storage methods to reduce risks of leaks, emissions, and accidents.
- **Layout and Design Alternatives:** The final layout incorporated buffer zones, green belts, and impervious flooring in operational areas to reduce soil

contamination and improve safety. Proper drainage and spill containment systems were included to mitigate any accidental releases.

- **Operational Alternatives:** Adoption of strict safety protocols, scheduled maintenance, and emergency response plans was preferred over less-regulated operational practices, ensuring better environmental protection.

4.4 Economic Alternatives

To enhance the project's economic viability and community benefits, several cost-effective and resource-efficient strategies were selected over conventional methods:

* Energy-Efficient Street Lighting: Adoption of LED lighting reduces operational energy use.
* Water Conservation Measures: Provision for rainwater harvesting and water-efficient plumbing fixtures.
* Job Creation: The project supports employment for engineers, architects, laborers, and service providers, stimulating the local economy.

These economic considerations not only reduce project costs but also provide long-term social returns, making the selected approach more sustainable and inclusive.

5 PROJECT DESCRIPTION

This Chapter presents the detailed project description along with project cost, land acquisition, implementation schedule, workforce and water requirements, etc.

5.1 Objective of Project

The main objectives of the project are:

- ✓ To establish a safe and efficient PETROLEUM storage and filling facility that meets the growing domestic, commercial, and industrial demand for cleaner fuel in Rahim Yar Khan and surrounding areas.
- ✓ To enhance energy accessibility in regions where piped natural gas is unavailable, reducing reliance on traditional biomass fuels like wood and coal.
- ✓ To promote economic development by creating direct and indirect employment opportunities and supporting local businesses.
- ✓ To ensure compliance with national and provincial safety, environmental, and operational standards, minimizing risks to workers, nearby communities, and the environment.
- ✓ To provide a cleaner-burning energy alternative, contributing to reduced indoor and outdoor air pollution compared to conventional fuels.

5.2 Location & Site Layout

5.2.1 Site Location

The proposed PETROLEUM storage and filling unit, CRG International, is located in the suburban periphery within the administrative jurisdiction of District, Punjab. The project area spans approximately 14138 Sft.

The site is strategically positioned to benefit from proximity to major transportation routes, public services, and urban infrastructure. It is:

- Accessible via main Road.
- Away from existing residential areas, educational institutions, and commercial zones.

- Free from ecologically sensitive areas, flood plains, and heritage zones.
- The land is non-forested, non-agricultural, and zoned for residential use. This ensures compliance with local zoning regulations and land use policies.

5.2.2 Site Coordinates

The GPS coordinates of the project site are 28.356802 N, 70.269207 E site location map is attached in next.

5.3 Land use of the site

The surrounding land is currently used for commercial purposes that aligns with the required land use.

5.4 Road Access

The proposed project site is well-connected through paved roads, specifically providing direct and reliable access to the area. This road infrastructure is vital for facilitating the transportation of construction materials, machinery, and workforce during the development phase, and will also support smooth vehicular access. The road access enhances the project's feasibility and aligns with sustainable planning objectives. A detailed road access map is included to illustrate the site's connectivity with the surrounding transport network.

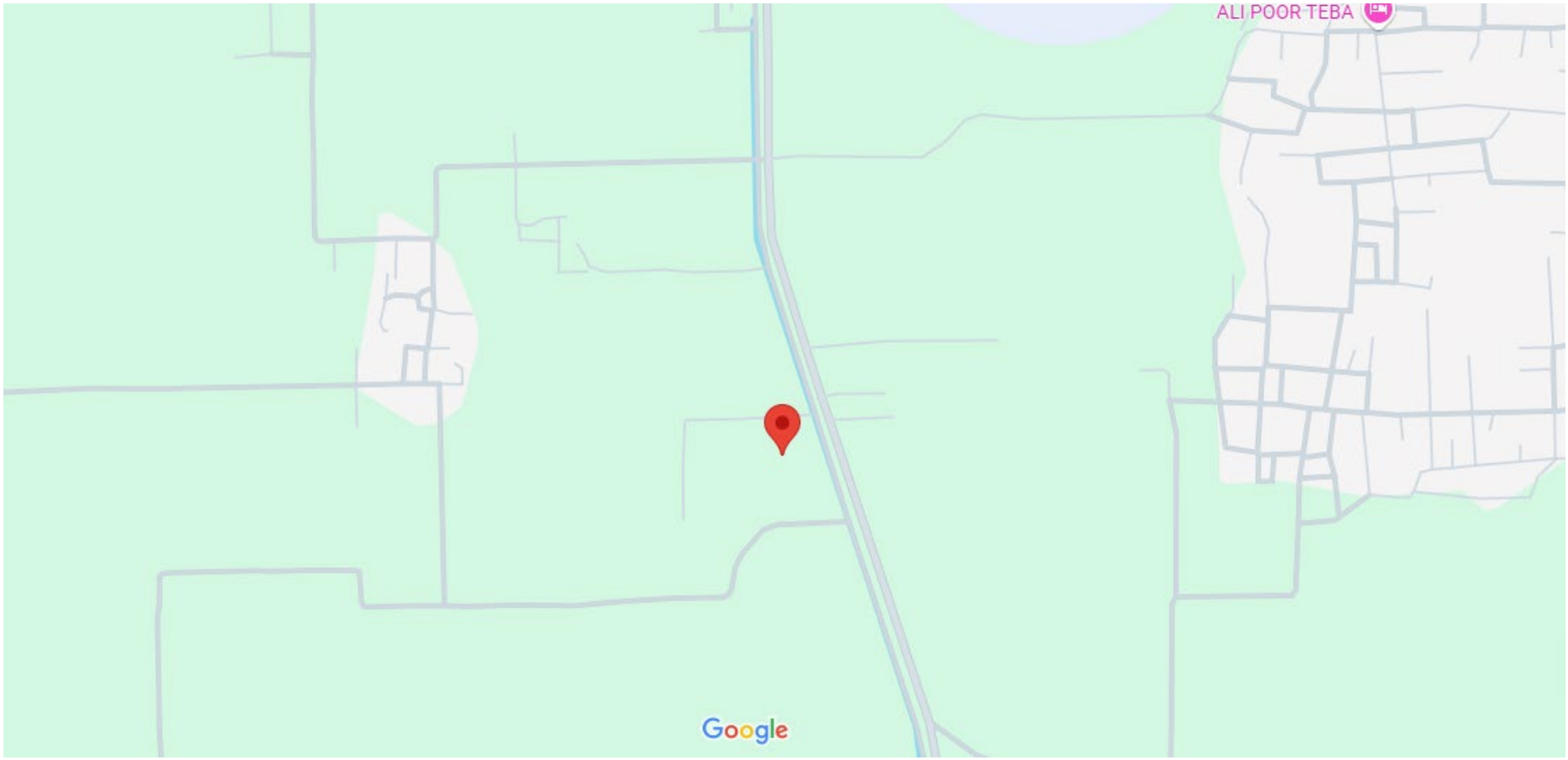


Figure 2 Rod Access Map

5.5 Vegetative Features of Site

The project site features sparse to moderate vegetation, primarily consisting of native grasses, scattered shrubs, and a few trees like kikar and sheesham. No rare or protected plant species are present, and the area has historically been used for intermittent agriculture.

5.6 Plantation Plan

To enhance environmental sustainability and aesthetic appeal, the proposed project includes the plantation of approximately 1,000 to 2,000 trees and shrubs within and around the site. The plan emphasizes shade-providing, ornamental, and native species, ensuring long-term ecological balance and improved air quality.

5.6.1 Key Features

Boundary Plantation: Fast-growing, pollution-tolerant species such as Neem and Peepal will be planted along the perimeter for screening, dust control, and noise reduction.

Ornamental Trees and Shrubs: Selected for visual appeal, seasonal flowering, and biodiversity support.

Native Species Priority: Focus on low-maintenance, drought-tolerant plants suited to climate.

5.6.2 Maintenance Plan

- **Watering**: Efficient irrigation to meet species-specific needs and minimize water wastage.
- **Pruning & Trimming:** Regular maintenance to ensure healthy growth and landscape aesthetics.
- **Annual Evaluation:** Yearly health assessments with prompt replacement of dead or unhealthy plants.

5.6.3 Landscaping Considerations

- **Sustainability:** Use of natural fertilizers and drought-resistant species to reduce resource consumption.

- **Seasonal Variety:** Integration of flowering plants for year-round color and visual interest.
- **Soil Health:** Maintenance of fertility using organic methods to support long-term plant growth.

Recommended Species

S. No.	Common Name	Scientific Name	Benefits
1.	Neem	*Azadirachta indica*	Air purification, drought-tolerant
2.	Peepal	*Ficus religiosa*	Shade-providing, improves air quality
3.	Kikar	*Acacia nilotica*	Native, soil enrichment, fast-growing
4.	Shisham	*Dalbergia sissoo*	Timber value, soil stabilizer
5.	Siris	*Albizia lebbeck*	Fast-growing, nitrogen-fixing
6.	Dherek	*Melia azedarach*	Ornamental, pollution control
7.	Bakain	*Melia azadirachta*	Aesthetic, hardy tree
8.	Mulberry	*Morus alba*	Provides shade, supports bird habitat
9.	Amaltas	*Cassia fistula*	Seasonal flowers, ornamental
10.	Bottlebrush	*Callistemon citrinus*	Attractive flowers, pollution absorber

5.6.4 Plantation Impact Assessment

The proposed PETROLEUM storage and filling unit project site, consists mainly of open land with limited existing plantation, including a few scattered shrubs and small trees. Satellite imagery and on-site observations confirm that no dense or structured plantations currently exist within the project boundary. However, green patches are visible in surrounding areas, particularly toward the northeast and southeast.

Potential Impacts:

Vegetation Disturbance: Minor vegetation may be removed during land development, especially in zones designated for infrastructure such as roads and utilities.

Dust Emissions During Construction: Dust generated from earthworks, vehicle movement, and material handling may temporarily affect surrounding greenery, particularly during dry or windy conditions.

Soil Compaction: Heavy machinery could compact soil, potentially affecting soil fertility and plant growth in adjacent areas.

Mitigation Measures:

☑ Controlled and phased clearing of vegetation, preserving mature trees where feasible.

☑ Frequent water sprinkling during construction to suppress airborne dust.

☑ Use of green mesh barriers around the construction area to protect adjacent green patches.

☑ Post-construction plantation of native, shade-giving, and pollution-tolerant species along internal roads, plot boundaries, and open spaces.

☑ Development of green belts and community parks within the scheme to enhance overall greenery and reduce environmental footprint.

5.7 Magnitude & Cost of Project

The Proposed project spans a total area of, marking it as a significant urban development initiative in the region. The project carries an estimated total capital investment of 150 million PKR, covering land development, infrastructure construction, utilities installation, and operational setup. The financial plan includes all costs associated with ensuring operational safety and environmental protection, eliminating the need for separate allocations for these aspects. Strong emphasis will be placed on

the safe management of equipment and operations through rigorous and proactive practices. This integrated financial and operational planning underscores the project's commitment to both economic viability and environmental responsibility.

5.7.1 Cost Breakdown

Amenities	Cost
Land Cost	40 million
Infrastructure development, water supply, boundary walls, electric supply, roads etc.	16 million
Solid Waste Management	02 million
Wastewater Management	03 million
Environmental Management and Monitoring Plan	05 million
Tree Plantation	01 million
Total Cost	66 million

5.8 Proposed Schedule of Implementation

Stage I: Preliminary Phase

In the initial eight weeks, the site will be cleared, surveyed, and prepared for development. Feasibility assessments, soil testing, and basic site planning will be carried out, along with initial project documentation and mobilization plans.

Stage II: Design and Approval Phase

Over the next 12 weeks, the detailed engineering design of the PETROLEUM storage tanks, filling sheds, safety systems, and utility infrastructure will be finalized. Simultaneously, regulatory approvals and NOCs will be obtained from OGRA, Punjab EPA, Civil Defense, and local authorities.

Stage III: Construction and Infrastructure Development Phase

Spanning approximately 16 weeks, this phase involves civil construction, tank installation, sheds, parking, utility connections, and firefighting infrastructure. Core

operational systems, such as drainage, spill containment, and electrification, will also be completed during this time.

Stage IV: Equipment Installation, Testing & Operations Start

In the final 8 weeks, equipment installation, leak detection systems, safety inspections, and trial runs will be conducted. Operational staff will be recruited and trained, and after successful safety checks, the commissioning and official operations of the PETROLEUM storage and filling unit will commence.

Table 2 Schedule of Implementation

ACTIVITY	TIME FRAME					
	Four Week	Four Week	Four Week	Four Week	Four Week	Four Week
Preliminary Phase						
Design Phase						
Approval Phase						
Construction Phase						
Infrastructure Development						
Equipment Installation & Testing						
Safety Inspection & Trial Runs						
Commissioning & Operations Start						
Commissioning & Operations Start						

5.9 Description of Project

5.9.1 Project Overview

The CRG International PETROLEUM storage and filling unit, located at Khewat No.12, Khatooni No. 68 to 96, Muraba No, 57 Killa No. 18, Mouza Dheerda, Tehsil & District Sheikhupura, Punjab, is a planned residential community designed to meet the growing demand for quality urban living. Spanning 14138 Sft.

5.9.2 Area Breakdown

Table 3 Features of PETROLEUM storage and filling unit

Sr. #	Description of area	Area in Kanal
1)	Residential plot area	135.31
2)	Commercial plot area	03.72
3)	Road area	67.57
4)	Park, Open space	16.30
5)	Public building	04.70
6)	Graveyard	04.70
7)	Solid waste management	00.50
8)	Total area	232.80

5.9.3 Process Description

The purpose of proponent is to establish an PETROLEUM Storage and Filling Plant unit to fulfill the basic needs of local community and to provide cost efficient products.

General Description

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

PETROLEUM Storage

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

Safety Features:

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

Filling Process:

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

Safety Precautions:

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

5.10 Available Facilities

1. Workforce

Manpower demand estimation is an essential component to facilitate deployment of manpower. Project will be constructed in phases. Tentative workforce required for proposed project during the construction phase will be about 35-50 workers/employees. Unskilled labor should be hired locally.

2. **Source of Water**

It is supposed that water tanks will be used by the contractor on the site for construction activities. The source of water during the operation phase for the proposed project will be the ground water.

3. **Water requirement**

The water consumption for construction phase is estimated to be 15,000 liters/day of the proposed Project.

4. **Wastewater Generation and Treatment Mechanism**

The wastewater generation is estimated to be 12,000 liters/day of the proposed Project. Wastewater treatment system will be installed.

5. **Solid waste**

The solid waste generation is estimated to be 150-250 kg/day which will be collected at designated place.

6. **Power requirement / power source**

The main source of electricity/electric power will be Water & Power Development Authority (WAPDA).

7. **Health, Safety, and Environmental Controls:**

The facility will implement standard operating procedures (SOPs) for hygiene, emergency response, and safety. All workers will be provided with personal protective equipment (PPE), and training will be conducted regularly. Fire safety measures will include extinguishers, alarms, and a dedicated open emergency assembly area within the site boundary.

8. **Personnel Protective Equipment (PPE)**

To safeguard workers during both construction and operational phases, the following personal protective equipment will be provided, tailored to the specific activities undertaken:

- Protective goggles
- Leather or rubber safety shoes
- Gloves
- Face masks
- Helmets
- Overcoats

These measures emphasize the project's dedication to maintaining high standards of workplace safety, environmental protection, and operational efficiency, aligning with best practices and regulatory requirements.

5.11 Restoration and Rehabilitation Plan

The project is located within a residential area, but given the nature of the development, there are no significant concerns related to displacement or disruption to local residents. The project is designed to avoid the need for relocation or demolition of any existing structures, ensuring minimal impact on the surrounding community. Therefore, there is no immediate need for restoration, rehabilitation, or relocation. The development will proceed in alignment with sustainable practices within the designated area. Over its estimated 25-year operational lifespan, all civil structures and infrastructure will undergo periodic renovations to maintain operational efficiency and safety standards, without requiring extensive rehabilitation or affecting the residential community.

5.12 Safety Signs/Safety Boards

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

5.13 Government Approvals and Leases

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

6 DESCRIPTION OF ENVIRONMENT

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

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

- Physical Environment
- Ecological Environment
- Socioeconomic Environment

6.1 Physical Environment

The following section provides an overview of the information on physical environment of the proposed Project study area collected from primary as well as secondary sources. The major parameters covered include Physiographic and Topography, Geology, Soil, Seismicity, Climate and Meteorology, Ambient Air & Noise, Water Resources, Solid Waste, and Land Use.

6.1.1 Topography

Rahim Yar Khan District is situated in the southernmost part of Punjab and serves as a transition zone between the fertile alluvial plains of Punjab and the arid expanse of the Cholistan Desert. It lies between 27°40′ to 29°16′ north latitudes and 60°45′ to 70°01′ east longitudes. The district shares its boundaries with Bahawalpur District to

the northeast, Rajanpur to the west, Ghotki District of Sindh to the south, and Jaisalmer in India across the eastern international border. The average elevation of the district is about 80–100 meters above sea level, gently sloping towards the southwest.

The topography of Rahim Yar Khan can be broadly categorized into three distinct zones. The canal-irrigated plains dominate the northern and central areas, comprising fertile alluvial soils deposited by the Indus River and its extensive canal network. This region is highly productive and supports intensive agriculture. Along the Indus River lies the riverine belt, characterized by low-lying floodplains prone to seasonal inundation and sediment deposition, creating a mix of fertile but hydrologically dynamic lands.

Towards the east and southeast, the landscape gradually transforms into the Cholistan Desert (Rohi), marked by vast sandy dunes, sparse vegetation, and arid plains. This desert area merges into the Thar Desert of Sindh and Rajasthan, reflecting a harsh, dry environment with limited agricultural potential. The district also exhibits traces of old riverbeds, dry channels, and sand ridges formed by the historical meandering of the Indus River, adding to the diversity of its physical features.

6.1.2 Geology

The geology of Rahim Yar Khan District is primarily shaped by its location within the alluvial plains of the Indus Basin. The region is composed of Quaternary alluvial deposits, which have been laid down over thousands of years by the Indus River and its tributaries. These deposits consist mainly of silt, clay, fine sand, and occasional gravel layers, making the soils highly fertile and suitable for agriculture in the canal-irrigated zones.

Beneath the alluvial cover, the bedrock geology belongs to the Indo-Gangetic sedimentary sequence, which includes older tertiary deposits that remain buried under thick layers of riverine sediments. In some areas, especially towards the Cholistan Desert, aeolian deposits dominate, consisting of wind-blown sand dunes and loess material, which indicate prolonged arid climatic conditions and desertification processes.

The Cholistan Desert portion of the district reflects a different geomorphological history, with extensive dune fields, interdunal plains, and dry river channels (hakras)—remnants of ancient river systems that once flowed through the region. These features point to the paleo-river networks that shifted over time due to tectonic and climatic changes.

6.1.3 Soil

Some areas of the district can be classified as sandy clay, but overall, the soils are mostly claying loam. The soils of the desert area/ Cholistan desert are saline, alkaline, and gypsiferous

6.1.4 Seismic Activity

The district belongs to zone 2A of the Seismic Zone Map of Pakistan, which means there will be minor to no damage to property due to earthquakes.

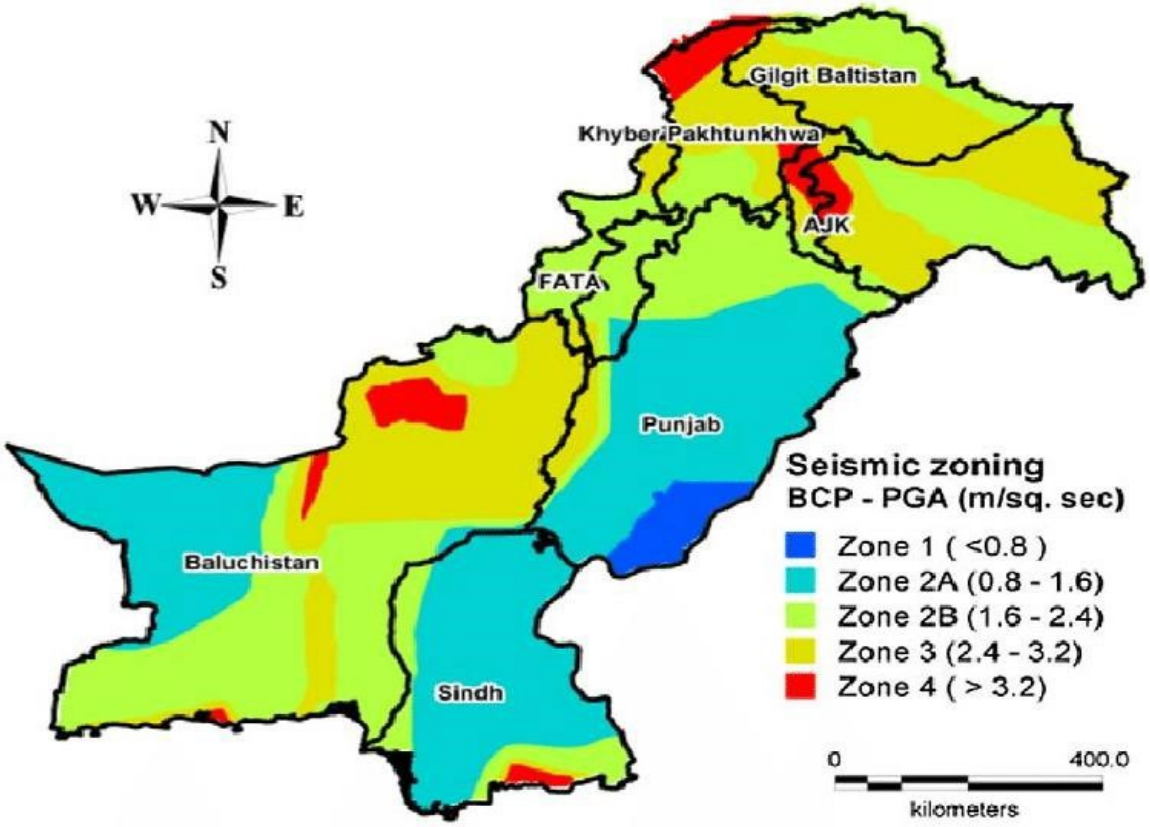


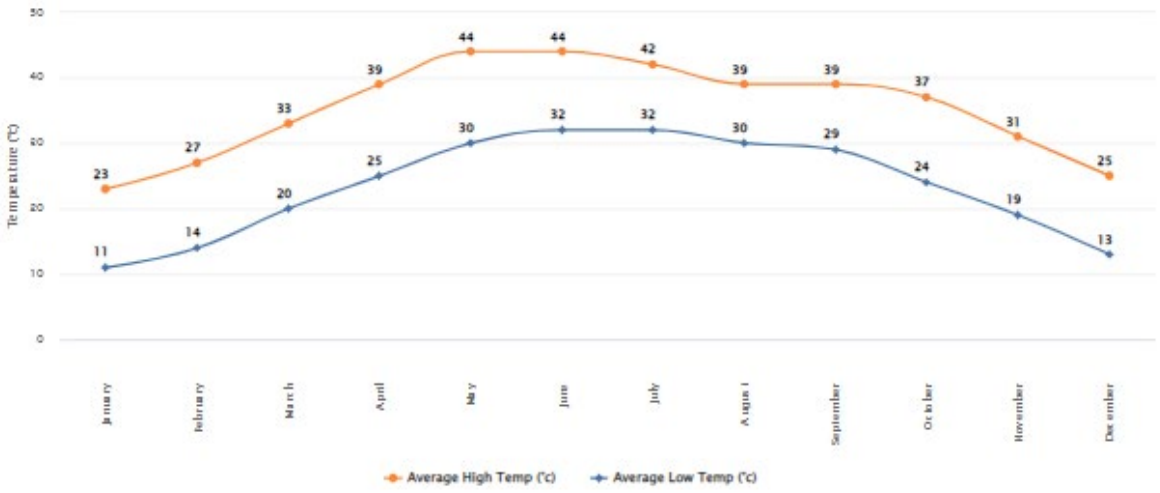
Figure 4 Seismic Zone of Pakistan

6.1.5 Climate

The climate of the Rahim Yar Khan is extremely hot and dry in the summer season while in winter the city is quite pleasant and is usually dry and cold. In RYK, the average annual temperature is 26.2°C. Precipitation here averages 101 mm. The summer season is reasonably longer than the winter season. The summer begins in the month of April and carries on until the month of October while the winter season starts from November to March. On the other hand, the month of March and November are agreeable here. Dust storms are quite common throughout the summer. The average rain fall in this city is about 100 millimeters.

Table 4 Average Weather in Rahim Yar Khan

Month	Day	Night	Rain Days
January	23°c	11°c	1
February	27°c	14°c	1
March	33°c	20°c	1
April	39°c	25°c	2
May	44°c	30°c	2
June	44°c	32°c	1
July	42°c	32°c	4
August	39°c	30°c	5
September	39°c	29°c	2
October	37°c	24°c	0
November	31°c	19°c	0
December	25°c	13°c	0



Average Rainfall

Graph 1 Average rainfall

6.1.6 Ground Water

Currently, the primary source of clean water in Rahim Yar Khan is groundwater, which fulfills the domestic, industrial, and commercial requirements of the district. Groundwater is extracted through tube wells installed at varying depths, generally ranging between 500 to 700 feet, depending on the local hydrogeology.

In the study area, the Rahim Yar Khan Municipal Corporation manages an extensive network of pipelines that distribute water to residents and commercial areas. The municipality operates multiple tube wells and water filtration plants to ensure the supply of safe and hygienic drinking water. These filtration units are regularly maintained and remain operational to meet public needs.

The average daily water supply in Rahim Yar Khan is estimated at approximately 30–35 million gallons per day (MGD), which is sufficient to meet the current daily demand of the population.

6.1.7 Surface Water Hydrology

Rahim Yar Khan's surface water hydrology is dominated by the Indus River and its extensive canal irrigation network, including the Abbasia and Desert Branch canals, which support agriculture and domestic needs. The riverine belt benefits from seasonal floodwaters that enhance soil fertility, while the Cholistan Desert area lacks permanent surface water bodies and relies on rain-fed ponds (tobas) and limited canal extensions. Old dry channels, such as the Hakra River, reflect the district's historical river systems. Overall, surface water availability is primarily dependent on river inflows and managed canal systems rather than direct rainfall.

6.2 Ecological Environment

Following is the description of the baseline ecological environment of the area.

6.2.1 Flora

The major **flora** of the district includes shisham (*Dalbergio sissoo*), babul (*Acacia nilotica*), eucalyptus (*Eucalyptus cineraria*), mulberry or toot (*Morus alba*), simal or silk cotton (*Bombax cieba*), sirin (*Albezia lebbek*), red gum tree or sufaida (*Eucalyptus camaldulensis*), neem (*Azardirachta indica*), mesquite (*Prosopis juliflora*), jand (*Prosopis spicigera*), vann or peelu/ tooth brush tree (*Salavadora oleoides*), okan or karir (*Capparis aphylla*), kikar (*Acacia Arabica*), pipal (*Ficus religiosa*), bargad or banyan (*Ficus benghlensis*), bakain or Persian lilac (*Melia azedarach*), frash (*Tamarix articulata*), lasura (*Cordia myxa*), talwar phali (*Oroxylum indicum*), amaltas (*Cassia fistula*), arjun (*Terminalia arjuna*), sukh chain (*Pongamia pinnata*), mahogany (*Swietenia macrophylla*), phulai (*Acacia modesta*), jungle jalebi (*Pithecellobium dulce*), gulhar or cluster fig (*Ficus racemosa*), sohanjna or drumstick tree (*Moringa oleifera*), haar singhar or night jasmine (*Nyctanthes arbor-tristis*), dhamna (*Grewia optiva*), and ber (*zizyphus nummalaria*).

Some **shrubs** grown in the district include timber or fern leaf acacia (*Acacia filicoides*), jawain or camel thorn (*Alhagi maurorum*), lani or salt bush (*Atriplex canescens*), shamshad or boxwood (*Buxus papillosa*), katkaranj or fever nut (*Caesalpinia bonduc*), kasondi or coffee weed (*Cassia occidentalis*), canicha or prickly sesban (*Sesbania bispinosa*), niazbo or basil (*Ocimum basilicum*), lajwanti or touch-me-not (*Mimosa pudica*), and khip or broom bush (*Leptadenia pyrotechnica*).

Some of the **grasses** found in the district include khabbal (*Cynodon dactylon*), dab (*Desmostachya bipinnata*), murat (*Panicum turgidum*), nut grass or mutha (*Cyperus rotundus*), and Indian Sandbur (*Cenchrus biflorus*).

6.2.2 Fauna

The fauna of the forests of the district includes jackals, hog deer, wolves, fox, wild boar, jungle cat, fishing cat, small Indian civet, smooth-coated otter, Bengal fox, mongoose, hare, and porcupines.

The Chichawatni Forests host a large variety of birds, which include Indian tree pie, white backed vulture, common myna, little green bee-eater, various varieties of doves, parakeets, fantail flycatcher, lapwings, black drongo, robin, sunbird, spotted owlets, black and grey partridges, babblers, shrikes, bulbul, cuckoo, koel, starlings, pheasants, house crow, house sparrow, black myna, honey buzzard, hoopoe, lark, and little egret.

The reptilian and amphibian fauna includes viper snakes, various varieties of lizards, common frogs, and toads.

6.2.3 Endangered Species

No endangered flora and fauna were found in the project area.

6.2.4 Protected Areas

As per field visits and consultations with wildlife and forest departments, the proposed project area does not fall in any protected area i.e. Game Reserves, National Parks, Wildlife Sanctuaries, or Forest areas, etc.

6.3 Socio-economic Information

The objectives of the given study are outlined as follow:

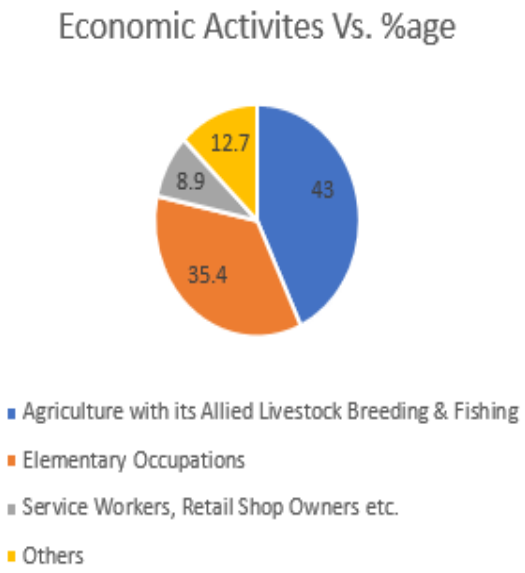
- To carry out the assessment of social impact. Acquire socioeconomic data to evaluate and identify the project interventions.
- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures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

6.3.1 Demographic Profile

The total population of district is 373.6 persons/ km^2. Out of which the male population is 51.26%, and female population is 48.73%. The urban population is 21.5%.

6.3.2 Economic Condition

The major activities in the district are agriculture, workshops, retail and others.



Graph 2 Economic Activities

6.3.3 Agriculture;

The district belongs to the Southern Irrigated Plains Agro-Ecological Zone of Pakistan. Agriculture is the dominant sector of the economy, with 56.3% of the population engaged in agriculture. Irrigated area is irrigated through tube wells and non-perennial canals.

Major crops of the district are cotton, sugarcane, and wheat. Rice, maize, tobacco, bajra, moong, maash, masoor and oilseeds such as rape/ mustard and sunflower are also grown in minor quantities in the district.

Fruits of the district include mangoes, citrus, guavas, and pomegranate as main fruits grown in the district; dates, jaamun, pears, phalsa, and banana are grown in minor quantities.

Main vegetables are potatoes, onion, and cauliflower. Vegetables grown in minor quantities include bottle gourd, bitter gourd, chilies, carrot, cauliflower, peas, and garlic.

6.3.4 Religion

The population of District is over 99% Muslim.

6.3.5 Languages and Major Castes

Punjabi and Urdu are spoken in the city. Main castes are chishty, Rehmani, LAK, Chadhar, Jatt, Tagga, Ansari, Butt,Dulu, Sayal, Kamboh, Bhadru, Mughal, Dogar, Sanpal, Gujjar, Arain, Rajput, Tajra, Hiraj and Shaikh Awan.

6.4 Quality of Life Values

6.4.1 Customs

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

6.4.2 Electric Supply

WAPDA power supply is available at the site.

6.4.3 Telephone Facilities

Both Landline and Cellular telephone facilities are present in the project area.

6.4.4 Educational Facilities

There are few educational facilities present in the vicinity of the project area. Most of the educational institutes are far away from the project site like around 5km radius.

6.5 Site Suitability

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

6.6 Project Response

90% of the respondents believed this project should be implemented. Construction of the project will create labor opportunities for locals, and it will help to improve the economic conditions of the area. Construction of the rice processing mill will also provide better living facilities for the people. The respondents also provided mitigation measures like certified contractors must be hired, proper plantation should be done, proper procedures should be followed etc. They said, if mitigation measures are implemented, they would have no objection.

7 IMPACTS AND MITIGATION MEASURES

This chapter provides a review of the potential impacts of the PETROLEUM storage and filling unit located at Khewat No.12, Khatooni No. 68 to 96, Muraba No, 57 Killa No. 18, Mouza Dheerda, Tehsil & District Sheikhupura over an area of 14138 Sft. The estimated cost for the subject project will be about 150 million PKR. These impacts could be both positive and negative and have been classified accordingly by a thorough review of the construction and operational phases of the project. This assessment numerates the magnitude of these impacts with the aid of environmental checklist and presents effective mitigation measures to counter their adverse nature.

7.1 Purpose of Environmental Mitigation Measures

Environmental mitigation measures are essential for ensuring the sustainable operation of the asphalt manufacturing unit, aligning with environmental compliance, and safeguarding ecological integrity. The rationale behind these measures is dissected through a series of critical inquiries:

1. **Identification of the Problem**

The core issue arises when environmental resources are exploited unsustainably, leading to significant degradation. Such exploitation diminishes the environment's resilience and carrying capacity, severely impeding its natural recovery processes. In the context of the proposed project, this could manifest as pollution, habitat disruption, or resource depletion, directly impacting the local ecosystem's health and functionality.

2. **Timing for Addressing the Problem**

The environmental impacts of the project will become apparent from the onset of construction activities and continue throughout the operational phase. These effects are not confined to the project site but may extend to surrounding areas influenced by project activities. Early identification and timely intervention are crucial for

preventing long-lasting or irreversible damage. Mitigation efforts should be initiated at the planning stage and integrated into all phases of the project lifecycle.

3. **Location for Mitigation Efforts**

Mitigation strategies should be applied at the source of the environmental impact. This means implementing measures directly within the project site and, as necessary, in adjacent areas that might be affected by project-related activities. Focusing on the origin of potential problems ensures targeted and effective mitigation, reducing the overall environmental footprint of the project.

4. **Approach to Addressing the Problem**

Addressing environmental issues necessitates adopting eco-friendly practices and technologies throughout the project's development and operation. Mitigation plans should include:

- Resource Efficiency: Minimizing the use of natural resources and promoting recycling and reuse to reduce waste.
- Pollution Control: Implementing advanced pollution control technologies and practices to minimize emissions, effluents, and waste generation.
- Habitat Protection: Avoiding or minimizing impacts on natural habitats and biodiversity, including the development of green belts and conservation areas.
- Community Engagement: Involving local communities and stakeholders in decision-making processes to ensure that mitigation measures address their concerns and benefit the local environment and population.
- Monitoring and Compliance: Establishing rigorous monitoring systems to assess the effectiveness of mitigation measures and ensure compliance with environmental regulations.

7.2 Impact Identification Methodology

The methodology for identifying potential environmental impacts associated with the proposed facility involves a comprehensive approach. It includes:

Review of Project Activities: Detailed examination of all phases of the project to understand the range of activities and their potential environmental interactions.

Environmental Study: Assessment of the surrounding environment to identify sensitive areas, ecological value, and any existing vulnerabilities.

Literature Review: Analysis of existing studies, reports, and publications related to similar projects to draw parallels and learn from past experiences.

Expert Judgment: Utilization of insights from environmental experts to predict potential impacts based on their expertise and knowledge of similar projects.

7.3 Approaches for Mitigation Measures

Mitigation of environmental impacts involves several strategies:

- **Avoid:** Altering project plans such as route or site adjustments to protect ecological or archaeological features.
- **Replace:** Creating equivalent ecological habitats elsewhere if the original habitat is disturbed.
- **Reduce:** Implementing measures like filters, cyclones, noise barriers, and visual screening to lessen impacts.
- **Restore:** Rehabilitating the site post-operations to their original state or better.
- **Compensate:** Providing support to displaced communities or individuals through relocation, facilities, or financial means.

7.4 Impacts and Mitigation Measures due to Location

Development will permanently alter the existing land use from open land to urban residential and commercial usage, impacting the rural character of the area. Construction activities will generate dust and noise, potentially affecting nearby communities and air quality temporarily. Movement of construction materials and, later, residential traffic could increase congestion on local access roads.

Mitigation Measures

Allocate green areas, parks, and open spaces within the project to maintain environmental balance. Sprinkle water on unpaved areas during construction to control dust emissions. Use noise barriers or schedule high-noise activities during daytime hours to minimize disturbance. Ensure that construction machinery is fitted with appropriate noise suppression equipment. Implement landscaping plans that use native tree and shrub species.

7.5 Impacts and Mitigation Measures in Construction Phase

i. Air Pollution

Impacts:

During the construction phase, significant dust emissions are expected from activities such as land clearing, excavation, movement of vehicles, and material handling. Construction machinery powered by diesel engines will also release particulate matter (PM), carbon monoxide (CO), and nitrogen oxides (NOx) into the atmosphere, potentially deteriorating local air quality. Dust may cause respiratory problems among workers and nearby residents if left uncontrolled.

Mitigation Measure:

Dust emissions, one of the major concerns, will be controlled through regular water sprinkling on all unpaved roads, open construction sites, and storage areas, particularly during dry and windy conditions. Additionally, construction material transport vehicles will be covered with tarpaulin sheets to prevent dust dispersion. Machinery and equipment will be regularly maintained to ensure that emissions remain within permissible limits, reducing air pollution.

ii. Noise Pollution

Impacts:

Construction activities, including excavation, operation of heavy machinery, and material transport, will generate high noise levels, potentially affecting the quality of

life of nearby residents and creating stressful working conditions for laborers. Prolonged exposure to elevated noise levels can cause hearing loss and increase stress.

Mitigation Measure

Noise pollution will be mitigated by limiting noisy construction activities to daytime hours, especially in proximity to residential areas. Construction machinery will be fitted with silencers and sound-dampening equipment to minimize noise levels. Workers will be provided with ear protection gear such as earmuffs and earplugs, and a noise monitoring program will be initiated to ensure compliance with National Environmental Quality Standards (NEQS).

iii. Soil Erosion and Degradation

Excavation, land leveling, and uncontrolled surface runoff during construction can cause soil erosion, leading to sediment deposition in local water bodies and loss of fertile topsoil. The disturbed soil surface becomes highly vulnerable to erosion by wind and water.

Mitigation Measures

To prevent this, temporary stormwater drainage channels and sediment control pits will be constructed around the site. Excavated soil will be stored properly with protective coverings to minimize erosion. Re-vegetation and re-compaction of exposed areas will be done promptly after construction activities to stabilize the soil.

iv. Water Pollution

Impacts:

During the construction phase, accidental spills of fuels, lubricants, and other hazardous substances could pollute nearby surface water resources or groundwater. In addition, improper disposal of wastewater from construction camps and equipment washing areas could contaminate water bodies.

Mitigation Measures

To mitigate this, all chemicals and fuels will be stored in designated areas with secondary containment. Mobile toilets and septic tanks will be provided for workers, and wastewater will be managed through proper drainage and treatment systems. Construction sites will be designed to minimize runoff carrying pollutants into natural drainage courses.

v. Solid Waste Generation

Impacts:

Solid waste will be generated from packaging materials, construction debris, leftover concrete, discarded steel, wood, and plastic materials. Improper disposal of such waste can create land pollution, visual nuisance, and health hazards.

Mitigation Measure:

A proper waste management plan will be implemented where waste materials will be segregated into reusable, recyclable, and non-recyclable categories. Authorized vendors will be hired for the collection, recycling, and disposal of waste. Efforts will also be made to reuse construction material, such as wood and scrap metal, to minimize waste generation.

vi. Occupational Health & Safety

Impacts:

The construction phase will expose workers to numerous health and safety risks, including falling from heights, injuries from machinery, exposure to hazardous chemicals, and accidents due to inadequate site safety. Without proper precautions, these risks could result in serious injuries or fatalities.

Mitigation Measure:

A comprehensive Health and Safety Management Plan (HSMP) will be developed and enforced. Workers will be provided with personal protective equipment (PPE) such as helmets, safety boots, gloves, high-visibility jackets, and safety harnesses. Regular

safety training sessions will be conducted, and first-aid kits and emergency medical services will be readily available onsite.

vii. Flora and Fauna Disruption

Impact:

Site preparation activities may require the removal of trees, shrubs, and other vegetation, leading to habitat loss for small wildlife species. The clearing of vegetation could also contribute to soil erosion.

Mitigation Measures:

To mitigate these impacts, vegetation clearance will be minimized as much as possible. Trees of significant ecological or aesthetic value will be preserved. After construction, compensatory plantation with native species will be undertaken to restore green cover and re-establish ecological balance in the area.

Basic Components	Duration	Location	Frequency	Extent	Significance	Nature
	Long	Short	Direct	Indirect	Continuous	Intermediate
Soil Erosion		✔	✔			✔
Air Quality		✔	✔		✔	
Ground Water Quality	✔			✔		✔
Noise Level		✔	✔		✔	
Wastewater Generation	✔		✔			✔
Solid Waste		✔	✔		✔	
Aesthetic		✔	✔		✔	
Flora	✔		✔			✔
Fauna	✔		✔			✔
Employment Rate	✔		✔		✔	
Economic Uplift	✔		✔		✔	
Health & Safety	✔		✔		✔	

7.6 Impacts and Mitigation Measure During Operational Phase

i. Air Pollution

Impact:

During the operational phase of the PETROLEUM storage and filling unit, continuous vehicular movement of PETROLEUM tankers, supply trucks, and customer vehicles may contribute to localized air pollution. Minor emissions of hydrocarbons may also occur during PETROLEUM handling, filling, and transfer operations if not properly controlled. Dust emissions from unpaved areas within the facility could also contribute to particulate matter (PM), potentially affecting workers and nearby communities.

Mitigation Measure:

To control air pollution, paved internal roads and loading/unloading areas will be developed to minimize dust. Regular road cleaning and water sprinkling will be carried out during dry conditions. Modern PETROLEUM handling equipment with leak detection systems will be installed to avoid gas release into the atmosphere. Greenbelts with indigenous trees and shrubs will be planted around the facility boundary to act as a dust and gas buffer. Preventive maintenance of vehicles and equipment will be strictly followed to reduce exhaust emissions.

ii. Solid Waste Generation

Impact:

Solid waste will mainly be generated from office operations, packaging materials, minor maintenance activities, and routine housekeeping within the facility. Improper disposal could lead to unhygienic conditions, and environmental degradation.

Mitigation Measure:

A structured solid waste management plan will be implemented. Waste bins will be placed strategically, with segregation at source (recyclable, non-recyclable, hazardous).

Non-hazardous waste will be handed over to municipal waste services, while any hazardous materials (e.g., used filters, oily rags) will be stored safely and disposed of at approved facilities. Staff will be trained on proper waste handling and disposal practices.

iii. Wastewater Generation

Impact:

Wastewater will primarily originate from sanitary facilities and cleaning operations. Improper disposal of untreated wastewater could contaminate soil and groundwater.

Mitigation Measure:

A septic tank will be installed to treat domestic sewage generated at the facility. Treated effluent will comply with Punjab Environmental Quality Standards (PEQS) before discharge or reuse for landscaping. Regular maintenance and monitoring of the system will prevent leakages and contamination.

iv. Noise Pollution

Impact:

Vehicular movement, PETROLEUM filling operations, and occasional use of compressors or generators may increase noise levels within the facility, potentially affecting workers and nearby residents.

Mitigation Measure:

Noise levels will be minimized through the installation of acoustic enclosures on noisy equipment and routine preventive maintenance. PETROLEUM filling and loading operations will be restricted to daytime hours. Green buffers with trees and shrubs will be planted along the site boundary to act as a natural sound barrier. Compliance with PEQS for noise will be ensured through periodic monitoring.

v. Traffic Congestion and Safety Issues

Impact:

The increased number of vehicles during peak times and the movement of goods and service vehicles can lead to traffic congestion, road safety risks, and delayed emergency response.

Mitigation Measure:

The internal road network is designed with sufficient width, turning radii, and parking spaces to accommodate the anticipated traffic volume. Speed limits will be enforced through signage, speed breakers, and traffic calming measures. Dedicated pedestrian walkways and cycle tracks will be provided. A traffic management plan will be updated regularly based on changing traffic patterns.

vi. Visual and Aesthetic Impacts

Impact:

Neglected landscapes, unmanaged waste, and deteriorating public spaces could harm the visual appeal and livability of the PETROLEUM storage and filling unit.

Mitigation Measure:

A regular maintenance schedule will be followed for parks, green belts, and public areas. Landscaping will use native and drought-resistant plant species for easy maintenance and year-round aesthetics. Strict enforcement of architectural controls and façade guidelines for commercial units will ensure uniformity and aesthetic appeal across the PETROLEUM storage and filling unit.

Basic Components	Duration	Location	Frequency	Extent	Significance	Nature
	Long	Short	Direct	Indirect	Continuous	Intermediate
Soil Erosion		✔	✔			✔
Air Quality		✔	✔		✔	
Ground Water Quality	✔			✔		✔
Noise Level		✔	✔		✔	
Wastewater Generation	✔		✔			✔
Solid Waste		✔	✔		✔	
Aesthetic		✔	✔		✔	
Flora	✔		✔			✔
Fauna	✔		✔			✔
Employment Rate	✔		✔		✔	
Economic Uplift	✔		✔		✔	
Health & Safety	✔		✔		✔	

7.7 Emergency Exits, Emergency Preparedness Plan, and PPE Details

1) Emergency Exits Details

- The facility will clearly mark emergency exits on all floors, ensuring at least two exits per production area.
- Fire-resistant doors will be installed to allow quick evacuation.
- Emergency exit maps will be displayed in key areas for easy navigation during evacuations.

2) Emergency Preparedness Plan

To ensure worker safety during emergencies, the unit will implement a structured Emergency Preparedness Plan, including:

a) Fire Safety Measures

- Fire alarms, sprinklers, and extinguishers will be installed at strategic locations.
- Regular fire drills will be conducted to train employees on evacuation procedures.
- Dedicated fire response teams will be trained to handle emergencies.

b) Chemical Spill & Hazardous Material Handling

- Chemical storage areas will be equipped with spill kits, absorbents, and neutralizers.
- Employees will be trained in chemical handling and spill response protocols.

c) Medical Emergencies & First Aid

- A fully equipped first aid station will be established within the facility.
- First aid training will be provided to staff, and medical response teams will be assigned.
- Emergency contact numbers and protocols will be displayed in all work areas.

3) Details of Personal Protective Equipment (PPE)

To minimize workplace hazards, employees will be provided with the following PPEs:

- **For General Safety:** Safety shoes, gloves, and protective clothing.
- **For Chemical Handling:** Chemical-resistant gloves, face shields.
- **For Air Quality Protection:** Dust masks and HEPA-filtered respirators for areas with air pollutants.
- **For Noise Reduction:** Earplugs or earmuffs in high-noise zones.
- **For Fire Safety:** Fire-resistant suits and gloves for designated personnel.

7.8 Environmental Enhancement Measures

Here are the environmental and safety measures:

- ✓ Workers will be trained in first aid and provided with medical facilities.
- ✓ Drugs and narcotics are prohibited during working hours.
- ✓ Machinery operators will wear proper protective gear.
- ✓ Water will be sprinkled on dusty roads and tracks.
- ✓ Personal Protective Equipment (PPE) will be provided during construction activities.
- ✓ Construction and domestic waste will be properly disposed of or utilized.
- ✓ Local communities will be informed in advance about construction work.
- ✓ Machinery will never be left unattended.
- ✓ Traffic management will be implemented to avoid disruptions, and overloading will be prohibited.
- ✓ Safety signs and boards will be displayed during construction.
- ✓ Standard Operating Procedures (SOPs) will be followed, along with Health, Safety, and Environmental (HSE) conditions.
- ✓ Native plants will be used to restore the area, and a tree plantation plan will be created.
- ✓ Solid waste will be handed over to contractors with an agreement.
- ✓ Noise levels will be controlled using appropriate measures.
- ✓ PPE will be provided to all workers.
- ✓ First aid facilities will be available at the site.

- ✓ All possible measures will be adopted to ensure the project is safe and environmentally friendly.
- ✓ Detailed planning for occupational health and safety (OHS) mitigation measures will be implemented.
- ✓ Employees will be trained in Environmental, Health, and Safety (EHS) policies and practices.
- ✓ Environmental management and compliance monitoring will be strictly followed.

8 ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

The Environmental Management and Monitoring Plan (EMMP) is a crucial component of the project's overarching strategy to ensure environmental sustainability and compliance throughout the construction and operational phases of said project. The primary aim of the EMMP is to effectively manage and mitigate adverse environmental impacts identified in the report, promoting environmental stewardship and sustainable development practices.

8.1 Objectives of the Environmental Management Program

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

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

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

Table 5 Environmental Management Plan

Sr. #	Impacts	Mitigation Measure	Responsibility	
			Implementation	Monitoring
Construction Phase				
1.	**Soil Erosion & Contamination** Due to the proposed construction activities, soil erosion and contamination may occur. Soil erosion may occur on roadside and excavation of earth/cutting operations whereas contamination of soil may be caused by oil and chemical spills at asphalt plant sites, equipment washing yards, camp sites and temporary construction site office. This impact is, however,	• Excess spoil should be reused where possible and residual spoil can be disposed of at designated site to prevent erosion • Loss of topsoil can be avoided by stripping and storing topsoil prior to construction, then re-using it to cover the completed cell • Confining excavations to the specified spots as per the approved engineering drawings. Unnecessary excavations need to be avoided;	Construction Contractor	Proponent

	temporary and low adverse in nature			
2.	**Air Quality and Dust** Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. Besides, multifarious construction activities and increased vehicular traffic (construction vehicles) would also contribute to the	• All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions • Preventive measures against dust should be adopted for on-site mixing and unloading operations; • Construction materials (sand, gravel, and rocks) and spoil materials will be transported through trucks covered with tarpaulins and all vehicles (e.g., trucks, equipment, and other vehicles that support construction works) will comply with	Construction Contractor	Proponent

	localized airborne dust. The Suspended Particulate Matter (SPM) of the size smaller than 10 micrometre (PM_{10}) tends to remain suspended in the environment for much longer and persistent time and is an environmental hazard. The objectionable impacts of settling of the suspended dust would be its dry deposition on vegetation, motor vehicles, structures, and other exposed surfaces. Similarly, exhausts from generators can also have impacts on air quality in the vicinity. The deteriorated ambient air quality may cause health hazards to the residents of nearby	the PEQS for carbon emissions and noise; • Regular water sprinkling of the site should be carried out to suppress excessive dust emission(s); • Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair is needed to minimize the hazardous emissions		

	residential colonies. The overall impact on the quality of air during the construction phase will be high adverse, however, it will be temporary and limited to the project's implementation phase only.			
3.	**Visual Aesthetics & Landscape Changes** Visual intrusion from large piles of excavated and construction material is one of the possible adverse impacts during the construction phase of the project. This impact is considered to be temporary and low adverse in nature.	• Material stockpiles should be removed as soon as work is completed and the area re-landscaped. During work, these stockpiles should be covered with tarpaulin and watered regularly.	Construction Contractor	Proponent
4.	**Noise and Vibration**	• The most common way to reduce the noise levels of common	Construction Contractors	Proponent

	The noise and vibration will be produced due to the operation of construction machinery equipment. Sources of noise and vibration during construction are heavy machinery. Noise and vibration are perceived as one of the most undesirable consequences of construction activity. The above machinery is expected to generate noise levels that would be severe in the Project Area. The noise and vibration may cause health hazards to the residents of nearby residential areas and sensitive receptors e.g. hospitals, educational institutes and mosques etc.	construction equipment is through worksite modifications. • All workers who need to work within the zone must wear hearing protection		

5.	**Solid Waste Generation** Different type of waste is likely to be generated during the construction phase of the proposed Project. The municipal waste will be in the form of food, cans, paper and wastewater from construction camps toilets and washing yards. Construction waste will include excavated soil, sand, gravel, rocks, asphalt, pieces of concrete, bricks, wood, metal pieces and electrical wires. Whereas, hazardous waste can be comprised of paints and construction chemicals. All these, if left unattended, can become a	• Waste disposal plan must be reviewed during the entire construction phase • Solid Waste generated during construction will be safely disposed in demarcated waste disposal sites and the contractor will provide a proper waste management plan; • Construction waste such as waste wood can be recovered and recycled into wood for new building projects, and cement, bricks, and plaster can be crushed and reused in other construction and building projects	Construction Contractor	Proponent

	source of nuisance and environmental pollution in the Project Area.			
6.	**Wastewater Generation** Wastewater will be generated at the construction site by the workers. If the generated wastewater is not properly treated or disposed of, this may contaminate the surface water sources	• Proper monitoring to check the compliance of PEQS will be carried out	Construction Contractors	Proponent
7.	**Flora & Fauna** No negative impact on the ecological environment will take place on account of cutting of any trees in the project area and clearing of vegetation from the site.	• Trees and ornamental plants shall be planted along the project boundary which will increase the aesthetic value of the site and will combat pollution. • Landscaping seemed to be a powerful mitigation activity with a positive impact.	Construction Contractors	Proponent
OPERATIONAL PHASE				

8.	**Air Quality** During the operational phase of the PETROLEUM storage and filling unit, continuous vehicular movement of PETROLEUM tankers, supply trucks, and customer vehicles may contribute to localized air pollution. Minor emissions of hydrocarbons may also occur during PETROLEUM handling, filling, and transfer operations if not properly controlled. Dust emissions from unpaved areas within the facility could also contribute to particulate matter (PM), potentially affecting workers and nearby communities.	• Regular vehicle checks to control/ensure compliance with PEQS. Vehicles with excessive smoke emissions should be monitored and penalties should be imposed in case of non-compliance. • Roadside tree plantations as applicable and feasible under local climatic conditions. Plants should be selected in accordance to their ability to absorb emissions;	Regular Monitoring	Proponent

9.	**Noise** During the operational phase, the noise levels are anticipated to increase mainly due to traffic related noise pollution and due to commercial activities in the Project Area.	• Penalties should be imposed for the use of vehicles having faulty silencers; and • People should be educated to promote using of less horns e.g. by placing signboards at road side	Regular Monitoring	Proponent
10.	**Wastewater** Improper operation and maintenance of sewerage system may lead to illegal ingress of municipal solid waste into manholes/sewers, deposition of silt/sludge reducing capacity of sewers significantly, choking of sewer resulting in stagnant of wastewater in the streets or in low lying areas. Stagnant	• Solid waste bins/containers should be placed at appropriate location along the roads and in streets to avoid entrance of solid waste into sewers. • Residents should be educated not to throw solid waste in wastewater sewers. • Installation of treatment plan for the treatment of wastewater	Regular Monitoring	Proponent

	wastewater may cause inconvenience to pedestrians, foul smell, unhygienic environment and health issues.			
11.	**Solid Waste** Solid waste management is a critical issue in the operational phase. Improper management of solid waste and accumulation of solid waste due to non-collection give rise to various severe issues to environment and health. Presence of solid waste heaps results in degradation of soil and land, choking of sewers if got way, create obnoxious odour	• An efficient and responsive general municipal solid waste collection, disposal, and management system should be strictly implemented • Waste bins should be provided at various convenient locations in the parks and the marketplaces for solid wastes by the passers-by. They should be regularly emptied and replaced, if found damaged and unserviceable. • Throwing of garbage and solid wastes onto greenbelts or vacant plots should be prohibited and fine should be imposed in the case of noncompliance	Regular Monitoring	Proponent

12.	**Fauna** There is no protected area, game reserve, game sanctuary, or national park in the project area so, no major impact on wildlife and livestock in the area is expected through noise, vibration, and any type of normal activity in the project area. This impact is Insignificant.	• Maintenance of the green areas and the protection of saplings to ensure better environmental conditions • Use of fertilizers should be strictly monitored in order to avoid any incident. Natural nutrients should rather be preferred	Regular Monitoring	Proponent

Table 6 Environmental Monitoring Plan

ENVIRONMENTAL MONITORING PLAN			
Receptors	**Monitoring Parameters**	**Monitoring & Reporting Frequency**	**Responsibility**
Water Resources/ Water Quality	Monitoring of Physical, Chemical and Biological parameters and its compliance with PEQS, 2016 for surface water and drinking water.	Once before the start of construction activities; On quarterly basis during the construction phase; Bi-annually for at least one year during O&M phase; and Visual inspection daily.	Proponent/ Management
Soil Contamination	Soil contamination due to effluent / surface runoff and uncontrolled solid waste disposal activities at sites.	• Once before the start of construction activities; • On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	Proponent
Dust Emissions	Monitoring of PM_{10} and $PM_{2.5}$ and its compliance with PEQS, 2016 for Ambient Air.	• Once before the start of construction activities;	Proponent

		• On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	
Noise Pollution	Monitoring of Noise Level and its compliance with PEQS 2016 for Noise.	• Once before the start of construction activities; • On quarterly basis during the construction phase; • Bi-annually for at least one year during O&M phase	Proponent
Ecological Resources	Disturbance to natural habitat and uncontrolled floral cutting which can be avoidable.	• Start of construction activities; • Visual inspection daily / weekly during construction phase • Annually for at least one year during O&M	Proponent
Safety of workers	Medical record of workers	• On quarterly basis during the construction phase.	• Contractor
Restoration of work sites	Site cleared and no solid and construction waste along the alignment	• After completion of construction work	• Contractor

8.2 Training of Workers

Prior to the commencement of project activities, an environmental and social training and technical support program will be implemented for Proposed project. This program is essential to strengthen institutional capabilities and ensure effective management of environmental and social aspects throughout the project lifecycle.

Building environmental awareness and providing relevant technical knowledge to the Contractor's workforce is crucial for the successful execution of the Environmental Management Plan (EMP). Without adequate training, the workforce may lack the understanding and skills necessary to implement the required environmental protection measures effectively.

Management will be responsible for engaging a Technical Assistance (TA) consultant to design and deliver comprehensive environmental and social training sessions.

The key objectives of the TA program will be:

- To assist in the development and establishment of effective environmental and social management systems;
- To deliver targeted training to senior management, contractors, subcontractors, and supervision consultants involved in environmental and social planning and management during both construction and operational phases; and
- To conduct specialized training modules covering monitoring techniques for air quality, water quality, and noise pollution.

Table 7 Training Schedule

Participants	Date, Time & Location	Training Topics	Schedule	Responsible Authority

Staff of project and the contractor	As specified	• Introduction to project EIA/IEE and EMMP • EMMP communication, documentation, monitoring, and reporting requirements	Every month	Project Manager
All site personnel	As specified	• Site induction training on HSE system and requirements at Incinerating Site • Environmental sensitivities of the project area • Communication of environmental problems to corresponding officials	After every week	Project Manager
Drivers	As specified	• Road safety • Road restrictions • Vehicle restrictions • Waste disposal. • Defensive driving	After every 3 months	Project Manager
Camp Staff	As specified	• Camp operations. • Waste disposal. • Good housekeeping	Monthly	Project Manager

8.3 Environmental Management Team

The successful implementation of the Environmental Management and Monitoring Plan (EMMP) for the project hinges on the coordinated efforts of a dedicated environmental management team. This team comprises various functionaries, each

with distinct roles and responsibilities throughout the construction and operational phases of the project.

8.3.1 Key Members of the Environmental Management Team:

Proponent:

Serves as the project proponent and owner of the Environmental Management Plan, overseeing its execution during both construction and operational stages.

Project Contractor(s):

Act as executors of the EMMP during the construction phase, responsible for integrating environmental mitigation measures into project activities.

Operational & Maintenance & Health, Safety, and Environment Team:

Execute the EMMP during the operational phase, ensuring ongoing compliance with environmental standards.

Environmental Protection Agency (EPA), Punjab:

Functions as the regulatory body for reviewing and monitoring the project's compliance with environmental remediation and mitigation measures outlined in the report.

8.3.2 Responsibilities of Functionaries:

a) **Project Management:**

Charged with overall environmental supervision, monitoring progress, overseeing mitigation measure implementation, documentation, training program development, and reporting on EMMP status.

b) **Project Contractor**

Responsible for adhering to all EMMP provisions, and environmental codes of conduct, and ensuring workers are equipped with and trained in the use of Personal Protective Equipment (PPE).

c) **Environmental Protection Agency (EPA):**

Reviews and monitors the project's adherence to the EIA's remedial and mitigation strategies.

8.4 Equipment Maintenance Details

A well-organized maintenance program is critical for ensuring the safety and efficiency of all tools, equipment, and vehicles used in the project. Regular inspections and adherence to safety regulations are mandatory to prevent accidents and injuries.

8.5 Proposed Environmental Monitoring

Environmental monitoring is vital for assessing the project's compliance with environmental regulations and its effects on the environment. It is divided into: Compliance Monitoring: Ensures the project's adherence to EIA and EMMP requirements through routine inspections and site monitoring.

Effects Monitoring: Identifies unanticipated impacts or those exceeding anticipated levels, allowing for the timely implementation of additional mitigation measures.

8.5.1 Monitoring Components:

Comprehensive baseline monitoring will be conducted across several key environmental parameters, including:

- Noise Levels
- Ambient Particulate Matter
- Ambient Air Gases
- Ground Water Quality
- Wastewater Quality
- Soil Contamination
- Solid Waste Management
- Vehicular Traffic and Emissions
- Flora & Fauna
- Health & Safety Practices
- Machinery and Equipment Maintenance

By establishing a robust environmental management framework, the project aims to minimize its environmental footprint, ensure the safety of its workers, and contribute positively to the local ecosystem and community.

8.6 Environmental Budget

Table 8 Environmental Budget

Environmental Component	**Quantity**	**Amount Pak Rs.**	**Details/Basis**
Landscaping/Plantation	1000-2000 approx.	1.5 million	Cost includes plantation and maintenance up to three years
Solid waste management	L.S	1.5 million	Lump Sum
Health & Safety Measures	L.S.	0.5 million	Lump sum
Wastewater management	L.S.	1.5 million	Lump sum
Miscellaneous Cost	L.S.	02 million	Lump sum
Air Quality Monitoring	2	12,000	2 samples @ 6000/sample
Water Quality Monitoring	2	12,000	2 samples @ 6000/sample
Noise Level Monitoring	2	10,000	2 samples @ 5000/sample
Soil Tests	2	10,000	2 samples @ 5000/sample
Training		15,000	Lump sum
External Monitoring		100,000	
Total Environmental and Social Management Cost		**09 million PKR**	

9 STAKEHOLDER CONSULTATION

Stakeholder consultation is a critical component in the environmental assessment process for the proposed project. It fosters communication among diverse groups, facilitating information exchange, feedback collection, and collaborative decision-making.

9.1 Benefits and Objectives of Stakeholder Consultation

Engaging with stakeholders offers several advantages, including improved project understanding, identification of environmental concerns, and incorporation of local insights into project planning. Key objectives include:

- **Enhancing Understanding:** Clarifying the project's aims and potential impacts to ensure stakeholders are well-informed.
- **Addressing Concerns**: Identifying and resolving stakeholder issues to prevent opposition and build consensus.
- **Building Trust:** Establishing a foundation of trust and cooperation between the project Proponent and stakeholders.
- **Informed Decision-Making:** Leveraging stakeholder input to make informed decisions regarding project design and implementation.

9.2 Identification and Classification of Stakeholders

A comprehensive stakeholder identification process was undertaken to recognize all parties with a personal stake in the project, classified as:

- **Industries:** Businesses and institutions directly affected or influential to the project outcome.
- **Local Communities:** Residents and groups in proximity to the project site are likely to experience its direct impact.

9.3 Views, Concerns, and Suggestions of Various Stakeholders

Stakeholder feedback highlighted several areas of concern and interest:

- **Environmental Preservation:** Emphasis on minimizing tree removal and establishing green zones.
- **Local Employment:** Dedicated support for prioritizing local residents in hiring processes.
- **Dust and Air Pollution Control:** Recommendations for regular dust suppression measures and continuous air quality monitoring.
- **Noise Management:** Suggestion to limit noise-generating activities to daytime hours.
- **Solid Waste Management:** Advocacy for proper waste disposal techniques to mitigate environmental impacts.

9.4 Methodology for Consultation

The consultation process involved a dynamic exchange of ideas through discussions, meetings, and field visits, aimed at:

- **Scoping Sessions:** Initial meetings to define project scope and identify key stakeholder concerns.
- **Focus Group Discussions:** In-depth conversations with local communities and government representatives to gather detailed feedback.
- **Location-Based Meetings:** Engagements held at various sites to ensure broad stakeholder participation and input.

This stakeholder consultation process underscores the project's commitment to environmental stewardship, community engagement, and sustainable development. By incorporating stakeholder feedback into the process, the project aims to achieve a balance between development objectives and environmental conservation, fostering positive relationships with all affected parties.

9.5 Environmental Management Team and Experts

Sr. #	Managers	Responsibilities
1.	**Contract Manager**	• Implementation of EMP • Environmental issues identification during pre-construction phase. • Communication EMP to all employees.
2.	**Contractor**	• Ensure that the control measures identified during environmental surveys are implemented as they are relevant to their work/visit. • Ensure that the project management team is notified of any non-conformance of control measures or environmental incidents where the environment has been put at risk.
3.	**Site Manager**	• Ensure site material and safe handling of hazardous waste. • Controlled access arrangement to avoid hazards. • Emergency egress arrangements to avoid any unfortunate incident. • First aid facilities/services should be readily available on-site.
4.	**Site HSE Advisor**	• Ensure good standards of workmanship. • Engaged health and safety to devise site waste management plan to be followed and implemented. • Daily checks & weekly checks. • Regular consultation with workers.
5.	**Site Environment Advisor**	• According to legislation and consent develop EMP. • Ensure application of EMP. • Conduct regular site inspection.
6.	**Public Contact Officer**	• First point of contact for members of the public. • Arrange and manage public forums. • Maintain relation with stakeholder

9.6 The Responsible Authority for EMP Implementation

The successful implementation of the Environmental Management Plan (EMP) is a pivotal aspect of ensuring the environmental integrity and sustainability of the proposed unit. The ultimate responsibility for overseeing and ensuring the effective execution of the EMP lies with the project Proponent.

Appointment of an HSE/Project Manager

To facilitate this, the project Proponent will appoint a Health, Safety, and Environment (HSE)/Project Manager possessing the necessary qualifications and expertise. This individual will assume the role of Environmental Manager, tasked with the comprehensive management of all health, safety, and environmental conditions as per the Punjab Environmental Quality Standards (PEQS).

Responsibilities of the HSE/Project Manager

As Environmental Manager, the HSE/Project Manager's responsibilities will encompass a broad spectrum of duties, designed to ensure that the project not only complies with all relevant environmental regulations but also adopts best practices in environmental stewardship.

9.7 Other Departments and Agencies

Following officers of government departments were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc, in their offices, for instance.

Sr. No.	Designation	Concerns
1.	**Environment Protection Department (EPD)**	
	General Manager	• Solid waste should be managed in Environmentally friendly manner. • Wastewater should be treated effectively & approval should be acquired from concerned agency before disposing off in nearby drain. • HSE* at the site should be managed effectively. • No impact is being foreseen due to the selected location. • Locals should be given job opportunity.
	Environmental Inspector	
2.	**Social Welfare Department (SWD)**	
	Deputy Director Officer	• Final goods should be affordable for the locals. • The proposed product should facilitate locals and they should be economical. • Job opportunities should be given to the locals. • Wages should be given according to the work assigned to them. • Life insurance of the workers should be given as well as all the facilities should be given as per labor laws.
3.	**Irrigation Department**	
	Subdivision	Following comments were suggested: • Untreated wastewater should not be disposed of in the nearby drains without proper treatment. • Beneficial as job opportunities will be available to the residents.
	Executive Engineer	
4.	**Forest Department**	

	District Forest Officer	Following recommendation were suggested by the forest department: • Plantation and landscape activities should be conducted on a broader scale. • Proper drainage system must be available at site

9.8 Consultation with Affected and Wider Community

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

Personal views of the respondents on the establishment of proposed project disturbance to the residents near the AOI and infringement of their privacy were also recorded. Various rounds of public meetings and consultations were arranged in the project and study area. The stakeholder category involves nearby residents, different industries, shopkeepers. The issues discussed with them are mostly related to the following:

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

10 RAINWATER HARVESTING SYSTEM

1. Annual Rainfall per year = 300 mm
2. Rainwater Potential Estimation

Runoff volume (m^3) =Area (m^2) * Rainfall (m) * Runoff Coefficient

3. Runoff Volume for Rooftops / Covered areas

Runoff Volume (m^3) = 55,848.6 * 0.3 * 0.8

= 13,403.664 m^3

4. Runoff Volume for Parks/ Open Spaces

Runoff Volume (m^3) = 1902 * 0.3 * 0.3

= 594 m^3

5. Runoff Volume for Roads

Runoff Volume (m^3) = 6475.2 * 0.3 * 0.9

= 1743.4 m^3

Total = 15741.064 m^3

6. Rainwater Harvesting Plan

- **Design Consideration for Roof Tops**

i. Collection surface => Rooftops
ii. Storage Options => Rooftop Tanks
iii. Filtration => sand-charcoal-gravel filter
iv. Usage=> non-potable use (flushing, gardening)
v. Capacity => Approx. 1000 liter per House

- **Design Consideration for Parks/ Open Spaces**

Design Option 1: Infiltration Trenches

i. Purpose => Recharge groundwater, prevent flooding

ii. Placement=> Along pathways and park boundaries

iii. Design:

i. Trench width: 0.5–1.0 m

ii. Depth: 1.0–1.5 m

iii. Filled with coarse sand and gravel

iv. Covered with permeable soil or turf

Design Option 2: Recharge Pits

i. Purpose => Collect stormwater from landscaped and paved areas

ii. Size: 1 m × 1 m × 2 m deep

iii. Filter Media: Brick bats, charcoal, gravel

iv. Spacing: Every 500–1,000 m^2 of park area

11 CONCLUSION

The project aims at the development of PETROLEUM storage and filling unit. The project falls under the category of projects requiring Environmental Impact Assessment (EIA).

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

- There are no sensitive elements/segments of environment around the project site.
- It has also developed ways and means for environmentally sustainable disposal of solid wastes to be generated from the project operations.
- The noise levels will be kept well within the required limiting values of the NEQS Pakistan.
- This project will create job opportunities during construction and operation stages leading towards reduction of poverty.
- Sewage will be passed through Septic Tanks before final treatment and disposal.
- It will help in the improvement of the community in the local area. It will also provide such facilities for people from other places.
- Project site means the development criteria like electricity supply, gas supply, water supply and sewage system.
- EMP, as recommended in this EIA Report, is to be put in place during all operational stages of the project.
- Environmental monitoring by the project proponent and a third party also ensures that the project will run in accordance with legal requirements.

Based on these findings of the EIA Report the project merits the issuing of Environmental Approval by the Environmental Protection Agency, Government of Punjab, and Lahore.

GLOSSARY

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

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

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

LIST OF ABBREVIATIONS

AA	Ambient Air
APHA	American Public Health Association
AOI	Area Of Influence
BOD_5	Biological Oxygen Demand
CMS	Convention On Migratory Species
COD	Chemical Oxygen Demand
dB(A)	Decibel
EA	Environmental Assessment
EHS	Environmental Health Safety
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
PEPA	Pakistan Environmental Protection Act
EPA	Environmental Protection Agency
ESIA	Environmental And Social Impact Assessment
ESA	Environmental And Social Assessment
ESMP	Environmental/Social Management Plan
EMP	Environmental Management Plan
EC	Electrical Conductivity
GIS	Geographical Information System
GOP	Government Of Pakistan
GPS	Global Positioning System

GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HSE	Health Safety & Environment
HWMS	Hazardous Waste Management System
EIA	Environmental Impact Assessment
I & D	Irrigation And Drainage
IAIA	International Association for Impact Assessment
IWM	Industrial Waste Management
IUCN	International Union for Conservation of Nature
KM	Kilometers
LGO	Local Government Ordinance
MW	Mega Watt
MEAS	Multilateral Environmental Agreements
MSDS	Material Safety Data Sheets
NEQS	National Environmental Quality Standards
PMD	Pakistan Meteorological Department
PPE	Personal Protective Equipment
PEQS	Punjab Environmental Quality Standards
NEAP	National Environmental Assessment Plan
NWFP	Northwest Frontier Province
Q&EHS	Quality, Environment, Health & Safety
O & M	Operation And Maintenance
PKR	Pak Rupees

PAP	Project Affected People
PEPC	Pakistan Environmental Protection Council/Punjab
PSC	Project Steering Committee
QA/C	Quality Assurance/Quality Control
RAP	Resettlement Action Plan
ROG	Reactive Organic Gas
SWM	Solid Waste Management
TDS	Total Dissolved Solids
UNFC	United Nation Framework Convention on Climate Change
UNCC	United Nation Convention to Combat Desertification
UNEP	United Nations Environmental Programs
GOP	Government Of Pakistan
WHO	World Health Organization
R&R	Rehabilitation And Resettlement
WWTP	Waste Water Treatment Plant

LIST OF INDIVIDUALS AND THEIR FEEDBACK

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

SOURCE OF DATA

- Punjab Environmental Protection (Amendment) Act 2012 (PEPA)
- Guidelines for the preparation and review of Environmental Reports, October 1997
- Review of IEE/ EIA Regulation, 2022
- The 2004 Baseline Survey on Millennium Development Goals in AACs, Pakistan
- World Weather Online.com
- Water and Sanitation Agency (WASA), Lahore.
- RED Data Book of IUCN
- Material Safety Data Sheet (MSDS) of chemicals
- www.wsask.ca/Global/Water%20Programs/Water%20Conservation/SWA
- Water_Efficiency_on_the_Farm_Booklet_WEB.pdf
- https://attock.punjab.gov.pk/district_profile
- https://pakistanalmanac.com/punjab-attock/
- http://www.madehow.com/Volume-2/Lead.html
- http://www.ijirset.com/upload/2013/november/18_Disposal.pdf

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

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

TERMS OF REFERENCES

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

1. Review Fee Payment:

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

2. Submission of Required Documents:

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

3. Financial Responsibility for Fines and Penalties:

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

4. Accuracy and Validity of Information:

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

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

In M/s **CRG International**