ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

PARCO GUNVOR LIMITED

Machike Terminal (T-2)

Mouza Dhant Pura, Tehsil & District Sheikhupura

Prepared by

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List of Abbreviation

3LPE	3- Layer Polyethylene
EA	Environmental Approval
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMT	Environmental Management Team
EPA	Environment Protection Agency
ERP	Emergency Response Plan
ERS	Emergency Response System
ESPAK	Environmental Services Pakistan Private Limited
FBE	Fusion Bonded Epoxy
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HSD	High-Speed Diesel
HOBC	High Octane Blending Component
IEE	Initial Environmental Examination
IFRs	Internal Floating Roofs
KL	Kilo Liters
LDS	Leak Detection System
MS	Motor Spirit
OHS	Occupational Health and Safety
PARCO	Pak-Arab Refinery Limited
PEPA	Punjab Environmental Protection Act

PPE	Personal Protection Equipment
Punjab- EPA	Punjab- Environment Protection Agency
USEPA	United States - Environment Protection Agency
VOCs	Volatile Organic Compounds
VRU	Vapor Recovery Unit
WMS	Waste Management Solutions

EXECUTIVE SUMMARY

PARCO Gunvor Limited is a leading energy logistics and petroleum storage company in Pakistan, formed as a joint venture between PARCO and Gunvor Group, a globally recognized energy trading company. The company specializes in the storage, handling, and distribution of refined petroleum products, playing a critical role in strengthening the national fuel supply chain and energy security. Through the development and operation of modern terminals and infrastructure, PARCO Gunvor Limited ensures safe, efficient, and environmentally compliant petroleum logistics across the country.

The PARCO Terminal is an oil depot constructed in 2008 for the storage and distribution of petroleum products. The terminal currently handles Motor Spirit (MS), High-Speed Diesel (HSD), and High-Octane Blending Component (HOBC). The facility consists of seven vertical Mild Steel tanks with Internal Floating Roofs (IFRs), two fire water tanks, pipelines for product transfer, a loading gantry, and a laboratory for quality control. The terminal is located in Mouza Dhant Pura, Tehsil and District Sheikhupura,

The project for the commissioning of its objective and operations requires fulfilling the legal requirements of the Punjab Environmental Protection Act (amended act 2012), Section 12, for which this Environmental Impact Assessment (EIA) report is being submitted.

TITLE AND LOCATION OF PROJECT:

Bulk Oil Depot Terminal-02 by PARCO Gunvor Limited at Machike, District Sheikhupura, Punjab, Pakistan

Location: Khewat No. 58, 81 Kahtooni No. 188 to 200/1, 269 Sqaure No. 19, Kila No. 6, 7, 14, 15/1, 15/2, 16, 17, 18, 23, 24, 25 Square No. 20 Kila No. 10, 11, 20, 21. Mouza Dhant Pura, Tehsil & District Sheikhupura

PROJECT PROPONENT

Proponent: Muhammad Badar Siddiqui, Manager Terminals-Machike

***CNIC No*:** 37405-5072870-5

Address: Mouza Dhant Pura, Tehsil & District Sheikhupura

NAME OF ORGANIZATION PREPARING REPORT:

Environmental Services Pakistan Pvt. Ltd (ESPAK)

Office No. 731, Block 2, Sector D1, Shahjilani Road Township Lahore

Contact: 042-35154012, 0312-0849999

BRIEF OUTLINE OF PROJECT

Table E-2Salient Features of the Project

Project Title	Bulk Oil Storage Terminal by PARCO Gunvor Limited
Project Location	Khewat No. 58, 81 Kahtooni No. 188 to 200/1, 269 Sqaure No. 19, Kila No. 6, 7, 14, 15/1, 15/2, 16, 17, 18, 23, 24, 25 Square No. 20 Kila No. 10, 11, 20, 21. Mouza Dhant Pura, Tehsil & District Sheikhupura
Land Area	99 Kanal 04 Marla
Proponent	Muhammad Badar Siddiqui, Manager Terminals-Machike
Consultant	Environmental Services Pakistan Private Limited (ESPAK)
Capacity of Project	The PARCO Gunvor Machike Terminal has a total storage capacity of 22,800 kiloliters for petroleum products and fire-water. This includes three Motor Spirit (MS) tanks with capacities of 2200 KL, 4000 KL, and 10,000 KL, two High-Speed Diesel (HSD) tanks of 2200 KL each, one HOBC tank with a capacity of 201A -2200 KL and two fire-water tanks of 1600 KL and 600 KL.
Cost of Project	2 Billion PKR
Product	The terminal currently handles three main petroleum products: ✪ Motor Spirit (MS/Petrol) ✪ High-Speed Diesel (HSD). ✪ High-Octane Blending Component (HOBC)

Status of Project	Operational
Source of Power	LESCO +Solar Power Plant

PROJECT OBJECTIVES

- To safely store and distribute petroleum products, including MS, HSD, and HOBC.
- To ensure seamless and safe transfer of products from the PARCO Gunvor Limited
- Ensure compliance with OGRA regulations and environmental standards.
- Contribute to national energy security and supply chain resilience.

SCREENING

Section 12 of the Punjab Environmental Protection Act (PEPA) 1997 makes it mandatory for the proponent of a project to file with the Environmental Protection Agency an Environmental Impact Assessment (EIA) in respect of the project.

The project falls under **Schedule-II, Category A (5), "Oil and gas extraction projects including exploration, production, gathering systems, separation and storage"**, i.e., of IEE & EIA Regulations, 2022, which requires an EIA. Thus, the EIA report is being prepared and submitted accordingly for approval.

PROJECT BASELINE

The project site is located in an area with established industrial land use, having access to essential infrastructure such as roads, electricity, and water supply. The surrounding environment comprises drainage systems. Current environmental conditions indicate ambient air quality within permissible limits, minimal noise levels, and no significant contamination of soil or water resources. The baseline assessment provides a reference for evaluating potential environmental impacts during the operational phases of the project.

PROJECT IMPACTS AND RECOMMENDATIONS FOR THEIR MITIGATION

Impact assessment is crucial for project initiation as it enables the identification and comprehension of a project's potential positive and negative effects. Understanding these impacts aids in tailoring the project to maximize benefits and minimize risks. Impact

assessment assists in recognizing environmental, social and economic challenges and risks and gives the directions to develop strategies that mitigate these risks and adjust the plan accordingly.

Key impacts related to the operation phase include:

- **Air Emissions** (VOCs from storage/transfer)

  Mitigation: Install VRUs, floating roof tanks, 3LPE pipeline coating

- **Noise Pollution** (pumps/generators)

  Mitigation: Acoustic enclosures, regular maintenance, worker ear protection

- **Spill Risks** (pipeline/tank leaks)

  Mitigation: Double-walled tanks, geo-membrane liners, API separator

- **Fire Hazards**

  Mitigation: Dedicated fire tank, suppression systems, ESD valves

- **Wastewater** (oily water, domestic sewage)

  Mitigation: Septic tanks, soak pits, oil-water separators

- **Solid Waste** (hazardous/non-hazardous)

  Mitigation: The solid waste produced at the project site is incinerated.

Table E-3 Environmental Management Plan

Possible Impact	Impact Magnitude	Mitigation Measures
Operational Phase		
Air emissions (VOC from MS, HSD, HOBC tanks; exhaust from pumps and generators)	Minor / Long Term	✪ Installation of floating roofs and vapor recovery systems on tanks. ✪ Periodic ambient air quality monitoring is conducted.
Noise emissions from pumps, vehicle movement, and standby generator	Minor / Long Term	✪ Soundproof enclosures around generators are installed. ✪ Generators are only operating during power outages. ✪ Equipment is maintained regularly to reduce noise. ✪ Trees/shrubs are planted as natural noise barriers.
Wastewater from tank bottom draining, laboratory, and sanitary facilities	Minor / Short Term	✪ Treat domestic wastewater via septic tank system. ✪ Oily wastewater is separately collected in oil water separator before disposal. ✪ Direct discharge of wastewater into soil or water bodies is prevented.

Possible Impact	Impact Magnitude	Mitigation Measures
Risk of spills and leakages from tanks, pipelines, and filling operations	Moderate / Long Term	✪ Bund walls/secondary containment are maintained around all storage tanks. ✪ Routine inspection of pipelines and tank is being performed. ✪ A spill response plan is being prepared and spill control kits are available. ✪ Staff is regularly trained in emergency handling.
Fire hazards due to storage of flammable petroleum products	Major / Long Term	✪ Fire water tanks (1600 KL & 600 KL) and firefighting network are maintained and routinely test ✪ Conduct regular fire drills and training. ✪ Proper grounding and bonding of tanks and pipelines is ensured. ✪ Fire alarm, detection, and foam system are installed.
Energy consumption and resource use	Minor / Long Term	✪ The solar system of 190 kWh on-grid is used to reduce grid dependency. ✪ Energy-efficient lighting and pumps are adopted.

Possible Impact	Impact Magnitude	Mitigation Measures
Landscaping and greenbelt development	Positive / Long Term	✪ Greenbelt around the terminal boundary is maintained. ✪ Native plant species are planted for low water demand. ✪ Environmental quality is improved and plants act as natural air/noise barrier.

ENVIRONMENTAL MONITORING PLAN

The implementation of a monitoring plan within an EIA is crucial for several reasons. It serves as a fundamental tool to track and evaluate the actual environmental effects of a project against the predicted impacts outlined in the EIA report. By establishing a monitoring plan, it becomes possible to assess the accuracy of the initial predictions, ensuring compliance with environmental regulations and standards. This ongoing assessment aids in identifying any unforeseen or adverse impacts, enabling timely corrective measures or adjustments to the project to mitigate or prevent environmental harm, fostering sustainable development and ensuring the project's alignment with environmental conservation objectives throughout its lifecycle.

Table E-3 Environmental Monitoring

Environmental Segment/Element	Monitoring Parameters	Reference Location/Monitoring Point	Monitoring Frequency
Operation Phase			
Ambient Air Quality	VOCs, PM_{10}, $PM_{2.5}$, NOx, SO_2	Terminal boundary, near MS/HSD/HOBC tanks, loading gantry	Quarterly

Environmental Segment/Element	Monitoring Parameters	Reference Location/Monitoring Point	Monitoring Frequency
Noise Levels	dB(A)	Near pumps, generators, and terminal boundary	Quarterly
Stack/Generator Emissions	CO, NOx, SO_2	Generator exhaust stack	Bi-annually
Wastewater Quality	pH, TSS, BOD_5, COD, Oil & Grease	Septic tank outlet; Oil water separator outlet	Quarterly
Soil Quality	Hydrocarbons, oil & grease	Tank area, pipeline corridor, loading gantry	Bi-annually
Groundwater Quality	pH, TDS, Hardness, Oil & Grease	nearest groundwater source	Annually
Fire Safety Systems	Fire water tank level, hydrants, extinguishers, alarms	Entire terminal	Monthly inspections
Solid & Hazardous Waste	Storage, labeling, disposal records	Hazardous waste storage area	Monthly
Energy Monitoring	Solar system output, grid consumption	Solar inverter panel & energy meter	Monthly
Occupational Health & Safety	Incident/accident records, PPE use, emergency drills	Whole terminal	Monthly reporting; Drills (quarterly/bi-annually)

Stakeholder Consultation

Stakeholder consultation at the Machike Terminal involved terminal management, operational staff, and contractors as key stakeholders. Discussions focused on air quality, noise control, traffic safety, occupational health and safety, and employment aspects. Operational and safety concerns were addressed through existing mitigation measures, SOPs, and awareness sessions. A GRM is in place to record and resolve any issues raised. Regular internal engagement ensures transparency, compliance, and effective participation in environmental and safety management.

Conclusion

The EIA confirms the project is environmentally viable when mitigation measures are implemented. Key conclusions include;

- No significant ecological or social impacts anticipated
- Site selection appropriately considered alternatives
- All major operational risks have mitigation plans
- Monitoring systems will ensure ongoing compliance

Recommendations:

- Immediate implementation of EMP
- Regular staff training on safety protocols
- Strict adherence to monitoring schedules
- Punjab EPA approval with standard conditions

Glossary

Air quality	Measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.
Area	Area is the quantity that expresses the extent of a two-dimensional figure or shape, or planar lamina, in the plane.
Compensation	Includes cash payment, deferred payment, a bond, an insurance policy, stipend, payment in kind, rendition of services, grant of privileges and disturbance money, entitlement to special treatment by government and semi government entities, grant of alternative land, grant of import licenses and business, trade and commercial facilities in addition to the rehabilitation and resettlement of an affected person.
Consultation	Consultation refers to two-way transfer of information or joint discussion between project staff and the affected population. Systematic consultation implies a sustained and rigorous sharing of ideas. Bank experience shows that consultation often yields the best resettlement alternatives, fruitful procedures for continued participation, and independent information on actual conditions for implementation.
Coordinates contaminate	Each of a group of numbers used to indicate the position of a point, line, or plane to make impure, pollute
Disclosure	The action of making new or secret information known
Disruption	Disturbance or problems which interrupt an event, activity, or process.
Environmental Management System (EMS)	A set of management process and procedure that allows an organization to analyses and reduce the environmental impacts of its activities. Environmental Monitoring Systematic, geo-referenced observations of the environment essential to detecting changes in ecosystems over time. Environmental Protection Plan (EPP) a practical tool that describes the actions required to minimize environmental effects before, during and after project implementation. The plan may include details about the implementation of the mitigation measures identified in the environmental assessment, such as who is responsible for implementation, where the measures are intended to be implemented, and within what timeframe.
Evaluation	The making of a judgment about the amount, number, or value of something; assessment.
Geology	A science that studies rocks, layers of soil, etc., in order to learn about the history of the earth and its life
Ground water	Aquifers currently being used as a source of drinking water or those capable of supplying a public water system. They have a total dissolved solid content of 10,000 milligrams per liter or less, and are not "exempted aquifers.
Habitat:	Land and water used by wildlife. This may include biotic and Abiotic aspects such as vegetation, exposed bedrock, water, and topography.

Hazardous	Substance or material, which could adversely affect the safety of the public, handlers or carriers during transportation
Impact	Any aspect of a project that may cause an effect; for example, land clearing during construction is an impact, while a possible effect is loss and fragmentation of wildlife habitat. Indirect Effect: An effect in which the cause-effect relationship (e.g., between the project's impacts and the ultimate effect on a Valued Ecosystem Component) has intermediary effects. As an interaction with another effect is required to have a cumulative effect (hence, creating intermediary effects), cumulative effects may be considered as indirect. Industry Relations Corporation (IRC) The Corporation or organization that a First Nation has created to manage the First Nation's relations, including Consultation with Alberta, Canada and Industry.
Land acquisition	The process whereby a person is compelled by a public agency to cede all or part of the land a person owns or possesses, to the ownership and possession of that agency, for public purpose in return for compensation.
Mitigation:	The elimination, reduction or control of the adverse environmental effects of the project. Mitigation includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. Non-Renewable Resource: Natural resources that are in fixed supply such as coal, oil and minerals.
Occupational health	Maintenance of the highest degree of physical, mental and social well-being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people, and people to their jobs
Parking	A parking garage is a building, or an area under a building, where cars can be parked.
Project area	The area specified by the funding and/or implementing agency according to the official gazette notification and includes the areas within the administrative limits of the provincial government.
Proponent	A person who advocates a theory, proposal, or course of action.
Rehabilitation	Include all compensatory measures to re-establish; at least lost incomes, livelihoods, living and social systems. It does not include the payment of compensation for required assets.
Resettlement	Means all measures taken to mitigate any and all adverse impacts, resulting due to execution of a project on the livelihood of the project affected persons, their property, and includes compensation, relocation and rehabilitation.
Residual Effect:	An effect that remains after mitigation has been applied
Scope	The extent of the area or subject matter that something deals with or to which it is relevant

Social Environment	It includes the culture that the individual was educated or lives in, and the people and institutions with whom they interact.
Stakeholders	Include affected persons and communities, proponents, private and public businesses, NGOS, host communities and EPA.
Topography	Details of the surface features of land. It includes the mountains, hills, creeks, and other bumps and lumps on a particular hunk of earth.

1 INTRODUCTION

1.1 BACKGROUND

Pakistan's fuel consumption patterns highlight the critical role of Motor Spirit (MS), High-Speed Diesel (HSD), and premium high-octane options like HOBC in powering transport and industry. MS serves primarily passenger vehicles and two-wheelers, while HSD dominates heavy-duty uses like trucks, buses, agriculture, and railways. HOBC, a high-octane variant, caters to performance vehicles but holds a niche share amid affordability concerns.

Pakistan's fuel consumption shows MS's sales at 216,400 tons in November 2025, up 30% year-on-year from rising mobility, with steady cumulative growth tempered by price sensitivity and annual demand in millions of tons met by refineries and imports. The HSD surged to 565,900 tons that month, a 52% increase driven by logistics, Rabi harvesting, and 75% refinery capacity, with 0.43 million tons imported in early FY2025, October up 21%, averaging 7.5 million tons yearly -88% for transport and Pakistan Railways using over 123 million liters in 2021-22. HOBC (92+ RON) sees marginal urban uptake among premium owners due to high costs versus standard MS, lacking dominant data as markets prioritize affordable HSD and MS over specialized blend

The PARCO Gunvor Terminal at Machike, District Sheikhupura is an established oil depot constructed in 2008 for the storage and distribution of petroleum products, including MS, HSD, and the high-octane fuel, HOBC. The terminal is located in Mouza Dhant Pura, within the town of Machike, Tehsil and District Sheikhupura, Punjab, Pakistan. The terminal plays a vital role in the regional fuel supply chain, receiving products directly from the PARCO refinery through dedicated pipelines and distributing them safely via tanker loading facilities. The facility comprises **seven (07) vertical mild steel tanks with IFRs, two fire water tanks, a loading gantry, and a quality control laboratory**. In addition to operational efficiency, the terminal is designed with strict environmental and safety measures, including spill containment, firefighting systems, and wastewater treatment, to ensure minimal environmental impact on the surrounding area.

1.2 SCOPE OF THE REPORT

For the EIA study, the scope of work is as under:

- Description of physical, ecological and socio-economic conditions in and around the proposed facility. Project impact identification, prediction and significance at all stages of the project including planning, implementation and operation.
- Evaluation of needs of disposal and regional dredging.
- Identification and assessment of the workability of mitigation measures to offset or minimize negative project impacts on environment.
- Providing mitigation measures or their appropriate alternatives.
- Identification of occupational hazards during all stages of the project and laying down suggestions for improvement in the conditions.

1.3 PURPOSE OF THE REPORT

The report aims to ensure that environmental considerations are integrated into the planning and decision-making processes prior to the commencement of project activities. It provides a detailed analysis of the project's potential impacts on the physical, biological, and socio-economic environment during the operational phases. Furthermore, this EIA outlines strategies and an Environmental Management Plan (EMP) to minimize adverse effects, enhance positive outcomes, and ensure compliance with the **Punjab Environmental Protection Act (PEPA), 1997**, and the **IEE/EIA Regulations, 2022**.

1.4 IDENTIFICATION OF PROJECT AND PROPONENT

The project is "Bulk Oil Storage Terminal by PARCO", Located at Mouza Dhant Pura, Tehsil & District Sheikhupura.

Proponent detail as following:

Proponent: Muhammad Badar Siddiqui, Manager Terminals-Machike

CNIC No: 37405-5072870-5

Address: Mouza Dhant Pura, Tehsil & District Sheikhupura

1.5 DETAILS OF CONSULTANTS

Environmental Services Pakistan Pvt. Ltd (ESPAK)

Office No. 731, Block 2, Sector D1, Shahjilani Road Township Lahore

Contact: 042-35154012, 0312-0849999

1.6 BRIEF DESCRIPTION OF NATURE SIZE AND LOCATION OF PROJECT

The proposed project involves the continued operation and minor upgradation works of the PARCO Machike Oil Terminal, an established petroleum storage and distribution facility located in Mouza Dhant Pura, Tehsil & District Sheikhupura. The terminal serves as a key downstream installation for receiving, storing, and dispatching refined petroleum products supplied through dedicated pipelines from PARCO. The facility comprises five vertical Mild Steel storage tanks, including 2 Motor Spirit (MS) tanks, 1 HOBC Tank, and 2 High-Speed Diesel (HSD) tanks, all equipped with Internal Floating Roofs (IFRs) to minimize VOC emissions. In addition, the site contains two fire water tanks with capacities of 1600 KL and 600 KL, a loading gantry, a quality control laboratory, administrative buildings, and utility systems.

The terminal receives product via two dedicated pipelines: an 8-inch diameter, 168 ft long MS pipeline and a 6-inch diameter, 158 ft long HSD pipeline. Fuel is dispatched through a structured loading gantry measuring 31’6” in width and 80’ in length. The installation is also supported by a 190 kWh on-grid solar system, reducing reliance on grid electricity and contributing to energy efficiency.

Figure 1-1 Location of the Project

1.7 LIST OF NAMES, QUALIFICATIONS AND ROLES OF TEAM MEMBERS CARRYING OUT THE EIA STUDY

The proponent has assigned the task of preparing EIA report to M/s Environmental Services Pakistan Pvt. Ltd (ESPAK). The EIA study of the project has been conducted according to Environmental Assessment Procedures, 1997, IEE and EIA Regulation 2022 as prescribed by the Punjab Environmental Protection Agency (Punjab EPA), Government of Pakistan. The study team of M/s Environmental Services Pakistan Pvt. Ltd (ESPAK) which completed the EIA report consists of following expert

Table 1-1 MEMBERS COMPLETED EIA PROCESS

Team & Qualification Environmental Team			
Sr. No	**Names**	**Designation**	**Qualification**
1.	Ali Ramzan	Lead Environmentalist	BS Environmental Science
2.	Nabia Farrukh Sohail	Environmentalist	MS Environmental Science
3.	Aruba Imran	Reporting Manager	BS Environmental Science
4.	Qurat-ul-Ain Nadeem	Assistant Manager	MS Environmental Science

**Only the main roles of the team members are given. However, their role was not restricted to these rather it also includes many other studies in their respective fields in the context of this EIA study*

2 SCREENING OF THE PROJECT

Screening is the first and most important step of the Environmental Impact Assessment (EIA) process under the Punjab Environmental Protection Act (PEPA) and the Punjab EPA Review of IEE/EIA Regulations. In this stage, the nature, scale, and potential environmental impacts of the proposed project are evaluated to determine whether it requires an Initial Environmental Examination (IEE) or a full Environmental Impact Assessment (EIA). The project is compared against the schedules provided in the Punjab regulations Schedule I (projects requiring IEE) and Schedule II (projects requiring EIA). If the project falls under Schedule II or is likely to cause significant adverse environmental effects, it must undergo a comprehensive EIA. Screening ensures that environmentally sensitive projects receive appropriate levels of assessment, helps avoid unnecessary studies for low-impact projects, and guides proponents toward compliance with regulatory requirements from the very beginning.

Based on the Punjab Environmental Protection Act 1997 and the IEE & EIA Regulations, 2022 for filing, reviewing, and approving environmental assessments, the present project is classified under **Category A (5), "Oil and Gas extraction projects including exploration, production, gathering systems, separation and storage"** i.e., the project requires an EIA study. Thus, an EIA report is being prepared and submitted accordingly for approval.

3 SCOPING OF THE PROJECT

Scoping is a critical initial phase in the EIA process, serving as a roadmap for the comprehensive evaluation of potential environmental effects associated with a project. It is pivotal in defining the boundaries, objectives, and methodology of the EIA study. The scoping process allows for the identification and prioritization of key environmental issues, ensuring that the assessment focuses on the most relevant aspects of the project. This early-stage engagement with stakeholders, including the public, governmental bodies, and experts, promotes transparency and inclusivity in decision-making. By clearly delineating the scope, the EIA process becomes more efficient, cost-effective, and targeted, streamlining the subsequent data collection and analysis phases. Ultimately, scoping enhances the overall effectiveness of the EIA, enabling a thorough examination of potential impacts, facilitating informed decision-making, and promoting sustainable development practices by integrating environmental considerations into the planning and decision-making processes

3.1 SPATIAL AND TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

The EIA for the Terminal has been carried out within clearly defined spatial and temporal boundaries to ensure accurate evaluation of all potential impacts. The spatial boundary covers the entire project area, including the tank farm, loading gantry, pipelines, laboratory, utilities, administrative block, and supporting infrastructure within the terminal premises. In addition, a buffer zone of 1 km radius surrounding the terminal has been considered to assess any potential off-site impacts on nearby land uses, settlements, air quality, noise levels, groundwater, and ecological receptors. The assessment also includes the dedicated MS and HSD pipelines, internal roads, and the truck loading/unloading areas.

✪ Spatial Boundary

The spatial boundary of the environmental assessment encompasses the Terminal includes the entire terminal premises such as storage tanks, pipelines, loading gantry, laboratory, administrative buildings, internal roads, drainage system, and utility areas.

The assessment also extends to the immediate surrounding area, including access roads, nearby settlements, and sensitive receptors within the zone of influence that may be affected by routine operations, emergency situations, or transportation activities associated with the terminal.

- **Temporal Boundary**

The temporal boundary of the assessment covers the operational phase of the terminal, as the facility is already developed and functional. Impacts have been evaluated over short-term (day-to-day operational activities), medium-term (periodic maintenance and routine operational variations), and long-term (continuous operation throughout the terminal's service life). The assessment also considers abnormal and emergency scenarios, including accidental spills, leakages, and fire incidents, as well as cumulative impacts that may occur over time due to sustained operation of the facility.

3.2 IMPORTANT ISSUES AND CONCERNS RAISED DURING CONSULTATION

During the stakeholder consultation process, meetings were held with transporters, terminal staff, and local authorities to understand their concerns regarding the operation of the terminal. The primary focus included the risk of fire or accidental spills, considering the flammable nature of the stored petroleum products. The stakeholder emphasized for the strong safety measures, regular emergency drills, and effective coordination with local rescue services. Concerns related to air emissions, noise from vehicle movement and generators, and traffic congestion near the terminal entrance were also highlighted. Stakeholders said that PARCO Gunvor is maintaining strict environmental controls, especially regarding solid waste disposal, and prevention of soil contamination.

Stakeholder also inquired about the terminal's preparedness for emergency situations, the availability of firefighting systems, and the maintenance of greenbelts to reduce dust and noise. Overall, stakeholders expressed support for the project, provided that environmental safeguards, and safety protocols, remain consistently implemented and strengthened where needed.

3.3 SIGNIFICANT IMPACTS AND FACTORS TO BE DETERMINED

The assessment of the terminal identifies several significant environmental and social factors that require detailed evaluation to determine the project's overall impact.

Given the nature of petroleum storage and handling following impacts were identified;

- Air emissions, particularly VOCs from MS, HOBC, and HSD tanks, as well as exhaust from vehicles and generators, are key concerns that influence local air quality.
- Risk of spills and leakages from tanks, pipelines, and loading operations also represents a major environmental and safety consideration, warranting a thorough risk assessment and review of spill-prevention systems.
- Factors such as noise levels from pumps, generators, and truck movement, soil and groundwater contamination potential, and the management of wastewater from septic tanks and oily water separators must also be carefully analyzed to determine their long-term effects.
- Additionally, the assessment focuses on fire and explosion hazards, given the highly flammable products stored on-site, making evaluation of firefighting capacity, emergency response planning, and safety compliance essential.
- From a social perspective, factors such as traffic flow, public safety, and worker health and safety are considered significant due to routine tanker movement and operational activities.
- The presence of environmentally sensitive receptors within the surrounding area, including nearby settlements within the 1 km range, further emphasizes the need to assess cumulative impacts and ensure mitigation measures remain effective throughout the project lifecycle.

3.4 DEVELOPMENT OF AN ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) has been developed to provide a systematic framework for managing, mitigating, and monitoring the environmental impacts identified during the assessment process. It outlines specific measures to address potential impacts on air quality, noise, water resources, soil, ecological features, and the socio-economic

environment during the operational phases of the project. The EMP also defines the roles and responsibilities of the proponent, contractors, and environmental supervisors, ensuring that all mitigation commitments translate into practical on-ground actions.

In addition, the EMP includes monitoring schedules, compliance reporting mechanisms, and emergency response procedures necessary to maintain environmental safeguards throughout the project lifecycle. It ensures that all project activities remain aligned with national environmental regulations, including the provisions of the Pakistan Environmental Protection Act (PEPA) 1997 and relevant guidelines of the Punjab Environmental Protection Agency. Through implementation of the EMP, the project aims to achieve environmental sustainability, reduce risks, and ensure continuous improvement in environmental performance.

4 DESCRIPTION OF THE PROJECT

The "Description of the Project" chapter provides a comprehensive overview of the key components, activities, and operational features of the proposed fuel storage enhancement at the Terminal. This chapter outlines the project's purpose, layout, capacity, and associated infrastructure, ensuring a clear understanding of how the facility will function throughout its operational phases. It also highlights the technologies, utilities, safety features, and environmental considerations integrated into the design, enabling a thorough assessment of potential impacts in later sections of the EIA. This foundational description ensures that all stakeholders and reviewers have a complete and accurate picture of the project before examining its environmental implications.

4.1 OBJECTIVE OF THE PROJECT

Following are the objectives of the project;

- To maintain and optimize fuel storage capacity through efficient operation of existing tanks for High Octane Blending Component (HOBC), MS, and HSD at the PARCO Machike Terminal, District Sheikhupura.
- To support the national petroleum supply chain and energy security by ensuring uninterrupted storage and distribution of petroleum products.
- To strengthen operational reliability through continuous maintenance of pipelines, pumps, monitoring instruments, and firefighting systems.
- To improve energy efficiency by utilizing the existing on-grid solar power system, reducing operational energy costs.
- To provide a strategically located terminal facilitating efficient fuel supply to Sheikhupura and adjoining districts.
- The project contributes to GDP growth by enabling efficient fuel storage and distribution for Northern Punjab.
- To ensure full compliance with OGRA storage regulations, applicable environmental standards, and safety requirements.
- The terminal strengthens the local and regional economy of Machike and District Sheikhupura through direct employment, indirect jobs in transport and services,

tax revenues, and increased commercial activity, thereby improving overall socio-economic conditions in the area.

M/s PARCO Gunvor Limited intends to develop the facility to maintain strategic reserves for the state, which is the prime objective. In addition to that, this will also help to improve the distribution of petroleum products to retail outlets in the area.

4.2 LOCATION AND SITE LAYOUT OF THE PROJECT

The site layout of the project has been attached as Figure 3-2.

4.3 LAND USE ON THE SITE

The project site at Mouza DhantPura, Tehsil and District Sheikhupura, is owned and utilized by PARCO Gunvor Limited for petroleum storage and terminal operations. The land is designated for fuel storage purposes and contains existing infrastructure such as fuel storage tanks, pump houses, pipelines, firefighting systems, administrative buildings, paved areas, and internal access roads.

Figure 4-1Current Land Use

4.4 ROAD ACCESS

The PARCO Gunvor Machike Terminal has direct and convenient road access through the Lahore–Sargodha Road, which runs adjacent to the terminal site. This major arterial road provides efficient connectivity for the movement of fuel tankers, service vehicles, and operational traffic to and from the facility. The proximity to the Lahore -Sargodha Road ensures smooth transportation of petroleum products while minimizing travel time and reducing disturbance to nearby residential areas. Adequate entry and exit arrangements are in place to ensure safe and orderly vehicular movement.

Figure 4-2 Road Access Near Project Area

4.5 VEGETATION FEATURES OF THE SITE

The project site is an established petroleum storage terminal where most of the land is occupied by paved areas, storage tanks, buildings, and internal roads, resulting in limited natural vegetation within the boundary. However, the proponent has carried out tree plantation and landscaping activities along the boundary to improve the site's environmental quality. These plantations mainly include ornamental trees, shrubs, and grass patches. No natural forests, significant vegetation, or agricultural crops exist inside the operational premises.

The pictorial evidences in the below figure clearly shows the maintenance of tree plantation by the project EHS team. Same will be carried out in future.

Figure 4-3Tree Plantation at the Project Site

4.6 COST AND MAGNITUDE OF OPERATION

Table 4-1Cost Breakdown

Sr. No.	Cost Component	Estimated Cost (PKR Million)
1	Installation Cost	290
2	Machinery Cost	950
3	Land Cost	100
4	Environmental Protection and Enhancement Budget	50
7	Others	610

Sr. No.	Cost Component	Estimated Cost (PKR Million)
Total Cost		2000

4.7 RESTORATION AND REHABILITATION PLANS

Since PARCO Gunvor Limited owns the land and the Machike Terminal is a developed and operational petroleum storage facility, large-scale restoration or rehabilitation is not required. All project activities take place within the existing boundary, and no new land acquisition, clearing of vegetation, or disturbance to natural habitats is involved. However, the proponent maintains a policy of continuous site upkeep, which includes routine repair of paved surfaces, proper housekeeping, maintenance of drainage systems, and the upkeep of greenbelts and tree plantations within the terminal.

4.8 SCHEDULE OF IMPLEMENTATION

As it is already constructed the schedule of implementation includes operational activities, including product receipt, storage, and dispatch, continue uninterrupted throughout the year as part of the terminal's regular functioning. Environmental management measures such as monitoring, housekeeping, emergency preparedness drills, maintenance of plantation, and safety inspections are carried out on a continuous basis.

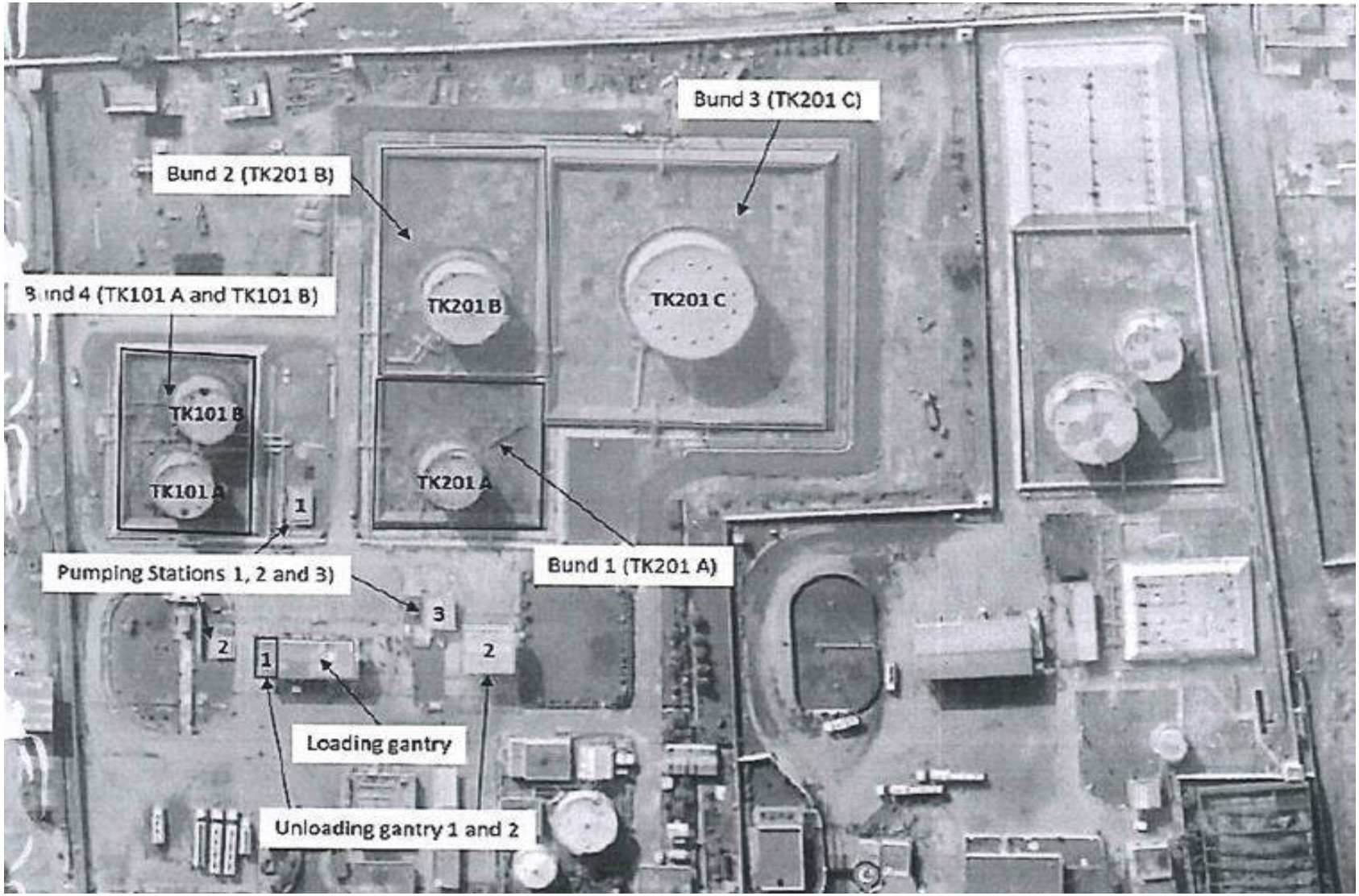


Figure 4-4 Project Layout

4.9 DESCRIPTION OF THE PROJECT

4.9.1 Products

The terminal stores and handles refined petroleum products, including

- Motor Spirit (MS),
- High Octane Blending Component (HOBC)
- High-Speed Diesel (HSD).

Products are received from PARCO Gunvor Limited and dispatched efficiently through the loading gantry system.

4.9.2 Tank Details

The PARCO Gunvor Machike Terminal has seven vertical storage tanks, which include:

- 2 MS tanks (201B -4000 KL, 201C - 10000 KL)
- 1 HOBC tank (201A -2200 KL)
- 2 HSD tanks (101A -2200 KL, 101B -2200 KL)
- 2 Fire water tanks (1600 KL & 600 KL)

All tanks are equipped with Internal Floating Roofs (IFRs) to minimize VOC emissions and ensure safe storage of flammable products.

The tanks are circular and designed with reinforced concrete foundations to support the full storage load. The foundation comprises a compacted coarse sand layer, bitumen anti-corrosive layer, and mass concrete base for stability. The typical tank foundation detail specifies:

Stone Toe Wall: 300×300 mm set in cement-sand mortar for added lateral support.

Earth Fill: Compacted in 200 mm layers at optimum moisture content up to 90% for proper load distribution.

Tank Base: RCC (Reinforced Cement Concrete) foundation to support the tank weight, with anti-corrosive treatment using bitumen sand layers.

Slope and Drainage: Slopes (1:11.5 or 1:16) to ensure proper drainage of rainwater or spillage.

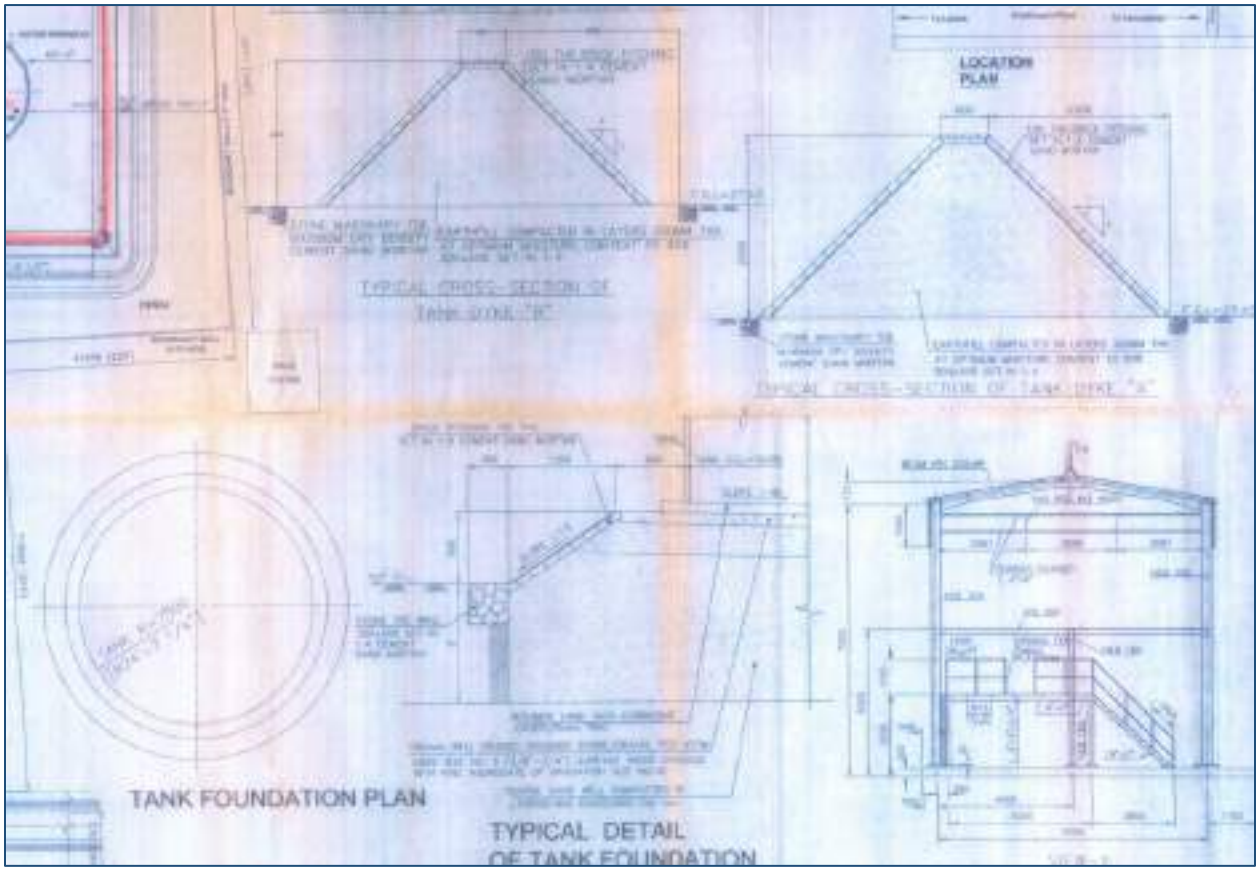


Figure 4-5Tank Foundations

Figure 4-6Tanks at the Project Site

4.9.3 Pipelines

The terminal receives products via two dedicated pipelines:

- MS Pipeline: 8-inch diameter, 168 ft long
- HSD Pipeline: 6-inch diameter, 158 ft long

These pipelines ensure safe and efficient transfer of petroleum products from the refinery to the storage tanks.

4.9.4 Infrastructure

The facility also includes following infrastructure;

- Operational laboratory
- Administrative block

- Firefighting system
- Paved internal roads

4.9.5 Emission Control Techniques

The following section describes the formation and control of each of the pollutants that can degrade environment.

Air Emission Control

3LPE Coating

3-Layer Polyethylene (3LPE) is a multilayer coating composed of three functional components: A high-performance Fusion Bonded Epoxy (FBE) primer, followed by a copolymer adhesive and an outer layer of polyethylene, which provides tough, durable protection.

Cathodic Protection System

Cathodic protection works by placing an anode or anodes (external devices) in an electrolyte to create a circuit. Current flows from the anode through the electrolyte to the surface of the structure. Corrosion moves to the anode to stop further corrosion of the structure.

The following emission control and environmental protection techniques have been integrated into the project design:

- Vapor Recovery Units (VRUs) at loading/unloading points to control VOC emissions.
- Double-walled tanks and spill containment bunds to prevent soil and groundwater contamination.
- Oil-water separator to treat contaminated runoff before discharge.
- Dust suppression on internal roads using water spray or chemical treatment.
- Noise control through acoustic enclosures on pumps and generators.
- Leak Detection Systems (LDS) for the pipeline segment.
- Cathodic protection for underground pipelines to prevent corrosion.

- Emergency shut-off valves and sensors for safety and containment.

All measures have been aligned with PEQS, IFC Guidelines, and best industry practices to minimize air, water, and soil emissions.

4.9.6 Utilities and Energy

The terminal operates with a 190 kWh on-grid solar system, which supplements electricity requirements and supports energy efficiency.

Figure 4-7Installed Solar System

4.9.7 Fire Fighting Arrangements

The site is equipped with comprehensive fire safety measures, including:

Table 4-2Fire Fighting Equipment

Equipment	Quantity	Location
Fire Water Monitors	02	Loading / Decanting Gantry Parking Area
Fire Hydrants	08	Various locations including Admin Building, Parking, Tank Areas, Maintenance Workshop
Hose Cabinets	05	Admin Building, Maintenance Workshop, Loading Pump House, Gate House
Mobile Foam Trolleys	02	Tank-01, Tank-02, Loading/Decanting Gantry
Foam Skid	01	Tank-01, Tank-02
Portable Fire Extinguishers (ABC Dry Chemical)	14	Office, Workshop, Store, Transformer Room, Generator Room
Portable Fire Extinguishers (CO_2)	11	Generator Room, Transformer Room, Workshop, Office, Gate House
Fire Extinguishers (Trolley Mounted 50 kg)	02	Gantry
Sand Buckets	06	Pump House, Loading Gantry
Fire Blankets	02	Loading Gantry, Office Kitchen

Figure 4-8Fire Fighting Arrangements

Figure 4-9 Fire Water Tank Pipelines

4.9.8 FUEL TANK

The transportation of HOBC from the PARCO Gunvor Limited Machike Terminal to distribution points is carried out using dedicated fuel tankers, commonly referred to as fuel tank. These fuel tanks are specially designed to safely carry flammable liquid fuels and are equipped with high-quality containment systems, anti-spill mechanisms, and safety valves to prevent accidents during transit. Loading of HOBC into fuel tank is conducted through the terminal's loading gantry, following strict safety protocols, including proper grounding, use of PPE, and spill containment measures. Regular inspections, driver training, and adherence to road safety regulations ensure that HOBC is delivered efficiently and safely to retail stations and other consumers, minimizing environmental and public safety risks.

Figure 4-10Fuel Tanks

4.9.9 Design, Safety Protection, and Operation of Pipeline

The pipeline has been designed in accordance with the international standard ASTM- 106(B). During the design of this project, all possible latest technologies and parameters have been considered. The proposed pipeline will be approximately 600 meter long and buried for its entire length.

Pipeline Wall Thickness

The selection of the material properties and the wall thickness to be used for the pipeline has been determined by the engineering teams on the basis of:

- International standards and design guidelines
- The loads that will be applied to the pipe, i.e., the internal pressures
- Limiting factors associated with the constructability of the pipeline (e.g., ease of welding) and the robustness of the line pipe during construction operations.
- As a result of engineering analysis, it is anticipated that the pipe's wall thickness will be 9.53 mm.

Block Valves

- Block valves are to be installed on the pipeline to provide the capability to isolate a section of the line in case of accidental leakage or damage and for maintenance or repair purposes.
- The placement of the pipeline valve will be at the start and end points, along with the online pressure meter to assure the pressure consistency for conformance.

Pipeline Safety and Protection

The pipeline safety is designed in accordance with engineering practice and the requirements of the engineering standards adopted for the project, safety factors have been incorporated in each element of the engineering design for the pipeline.

Corrosion Protection

The pipeline will be protected from external corrosion by a combination of a high-integrity three-layered polyethylene coating system. Following commissioning, regular monitoring activities will be carried out to ensure that adequate protection potentials are achieved and that power sources are operating within their intended limits.

Leakage Protection

A state-of-the-art leak detection system will be installed. It will operate by comparing actual profiles of flow, pressure, temperature, and density with modelled profiles of the same parameters. Excessive differences between the real-time measurements and the modelled profiles indicate possible pipe failure and leakage.

The system will be able to identify smaller leaks over a longer period of time. The leak detection system will be designed to accommodate routine pipeline operating conditions (steady-state), as well as transient conditions.

Emergency Shut Down

- Emergency shut down (ESD) valves will be installed at the perimeter of the pump station site.
- Shut down of the pipeline system will be initiated manually in response to an ESD situation or predetermined abnormal operating conditions.

Electrical and Miscellaneous Works

The electrical and other auxiliary works will essentially consist of the following:

- Mechanical Electrical services including power, lighting etc.
- Plumbing and drainage services.
- Fire Protection works
- Coloring & Painting
- Carpentry work

Manpower Requirements

During operation, the terminal will employ:

Permanent staff: Approx. 20-25 persons, including managers, operators, safety personnel, and maintenance technicians

Contractual/outsourced staff: 10-15 persons (guards, drivers, cleaners)

4.9.10 PROJECT ACTIVITIES

As the terminal is fully constructed and operational, the project involves the continuation of existing operations, including routine maintenance, safety management, environmental

compliance, and monitoring. This ensures safe storage, efficient handling, and uninterrupted supply of petroleum products to the region.

4.9.11 AREA OF THE LAND

The PARCO Gunvor Machike Terminal is located within Mouza Dhant Pura, Tehsil & District Sheikhupura, covering a total area of approximately 99 Kanal 04 Marla.

5 DESCRIPTION OF THE ENVIRONMENT

5.1 GENERAL

This chapter provides a comprehensive overview of the existing environmental conditions in and around the PARCO Gunvor Limited Machike Terminal, which forms the baseline for assessing potential impacts of the project. It covers the physical, biological, and socio-economic components of the environment, including climate, air quality, water resources, soil, vegetation, wildlife, land use, and local communities. The baseline information has been collected through field surveys, monitoring, and secondary data sources to ensure a clear understanding of environmental sensitivities and resources that may be affected by project activities. This description serves as the foundation for impact assessment, mitigation planning, and environmental management throughout the project lifecycle.

5.2 PHYSICAL ENVIRONMENT

5.2.1 Settlements around the Project Area

The presence of Dhantpura is located 700 meters away from the project site. All operational activities are confined within the designated project boundary. Air emissions are controlled through vapor recovery systems and compliance with applicable environmental quality standards, while noise levels are managed with acoustic enclosures, and regular maintenance of equipment to ensure they remain within permissible limits. Fire and safety risks are minimized through robust safety systems, including firewater tanks, foam systems, flame arrestors, and an effective ERP. Additionally, controlled traffic movement, proper drainage, and effective waste management practices further reduce the potential for nuisance or health impacts.

Figure 5-1Settlements around the Project Area

5.2.2 Terrain of the Area

The terrain of the area surrounding the terminal is generally flat to gently undulating, characteristic of the plain's region of Sheikhupura District. The site itself is level, facilitating the construction and operation of storage tanks, pipelines, and associated infrastructure. There are no significant natural hills, depressions, or water bodies within the terminal boundary, which reduces the risk of soil erosion and flooding on-site.

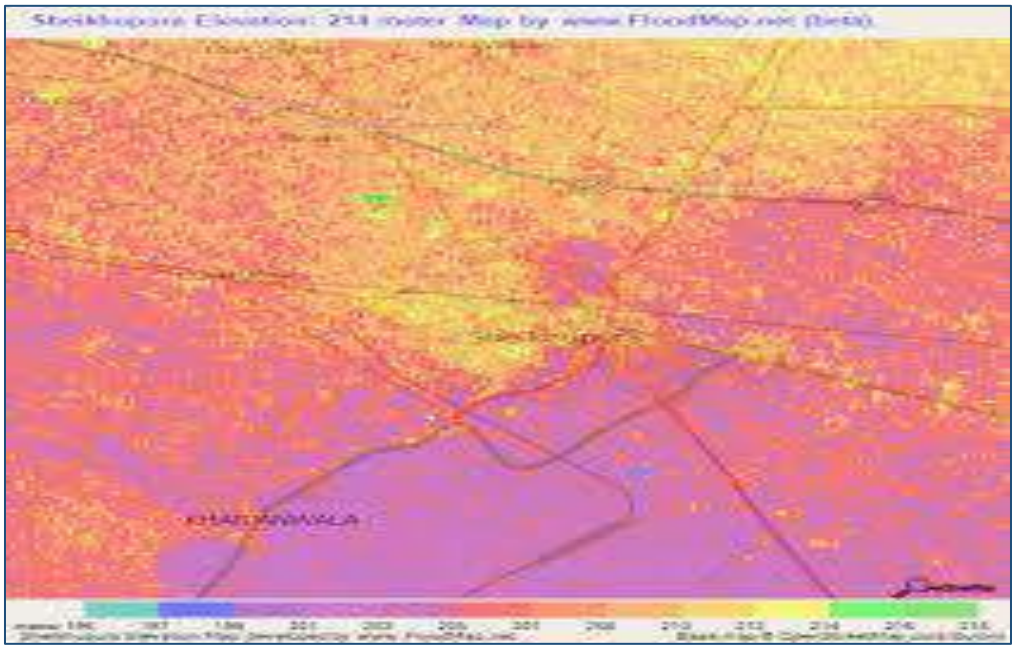


Figure 5-2Topography of the project

5.2.3 Soils

The soil at and around the terminal is predominantly alluvial in nature, typical of the Punjab plains. It consists mainly of silt, sand, and clay mixtures, with good bearing capacity suitable for construction of heavy infrastructure such as storage tanks, pipelines, and administrative buildings. The soil is moderately fertile but has been largely covered by paved areas, tank foundations, and other terminal infrastructure, limiting its natural use for vegetation or agriculture within the site. Drainage is generally adequate due to the flat terrain, and no significant soil erosion or degradation has been observed within the terminal premises. Proper containment and drainage systems have been implemented to

prevent contamination from accidental spills, ensuring that the soil remains protected from petroleum products and operational wastes.

5.2.4 Climate and Meteorology

Dhantpura, Sheikhupura typically sees high temperatures averaging around 42°C (104°F) during the summer months of June through August, accompanied by high humidity levels. Winter, spanning from December to February, brings relief with temperatures dropping to around 8°C (41°F) to 10°C (50°F). The region receives most of its rainfall during the monsoon season, which extends from July to September, contributing to the annual precipitation of approximately 540 millimeters. Due to its geographical location and climatic conditions, Sheikhupura faces challenges such as water scarcity during the dry months and occasional flooding during heavy monsoon rains, emphasizing the importance of sustainable water management and infrastructure development in the region.

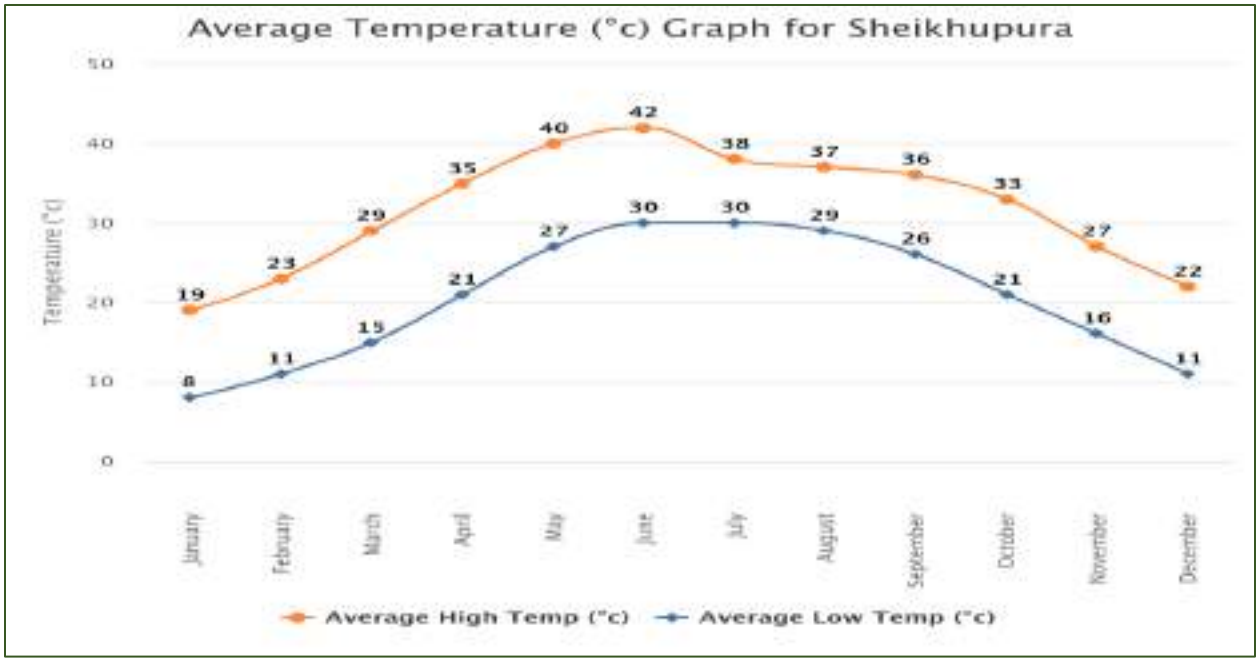


Figure 5-3 Average Temperature of the Area

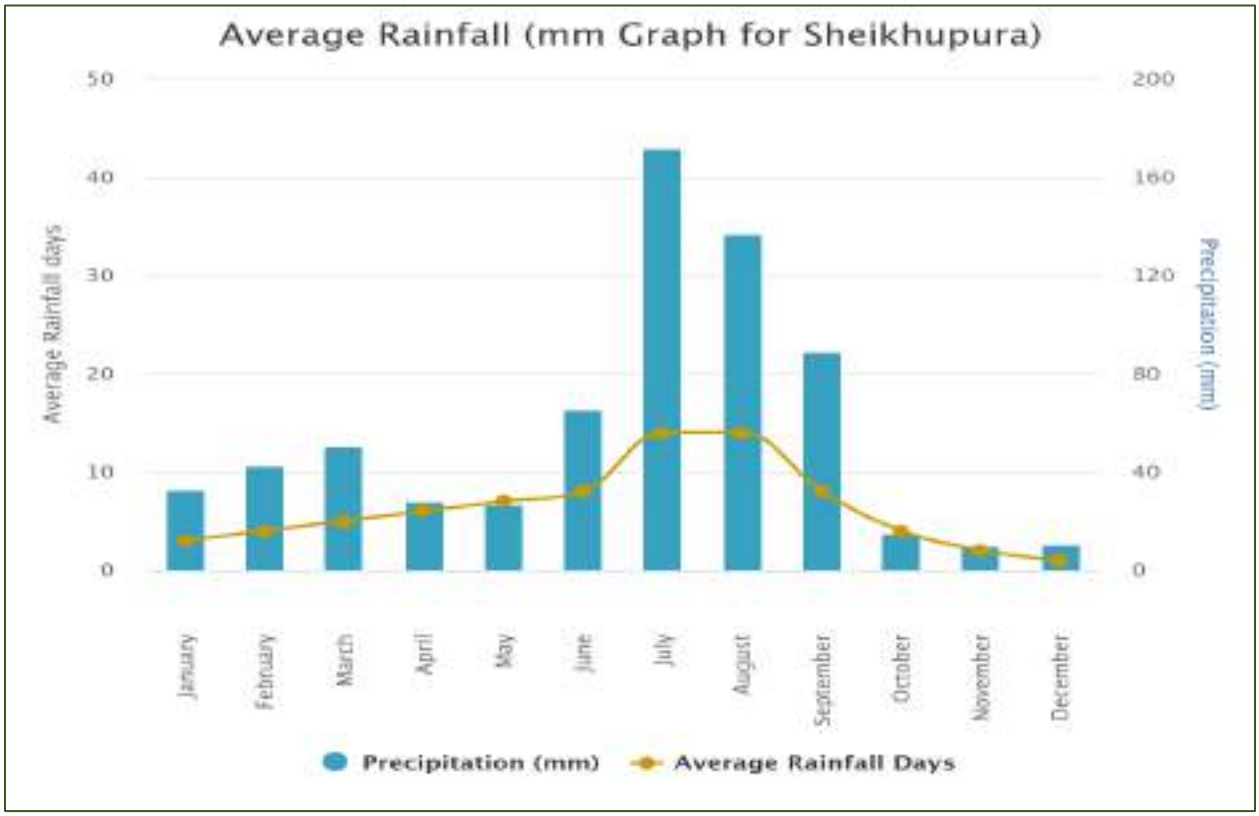


Figure 5-4 Average Rainfall of the Area

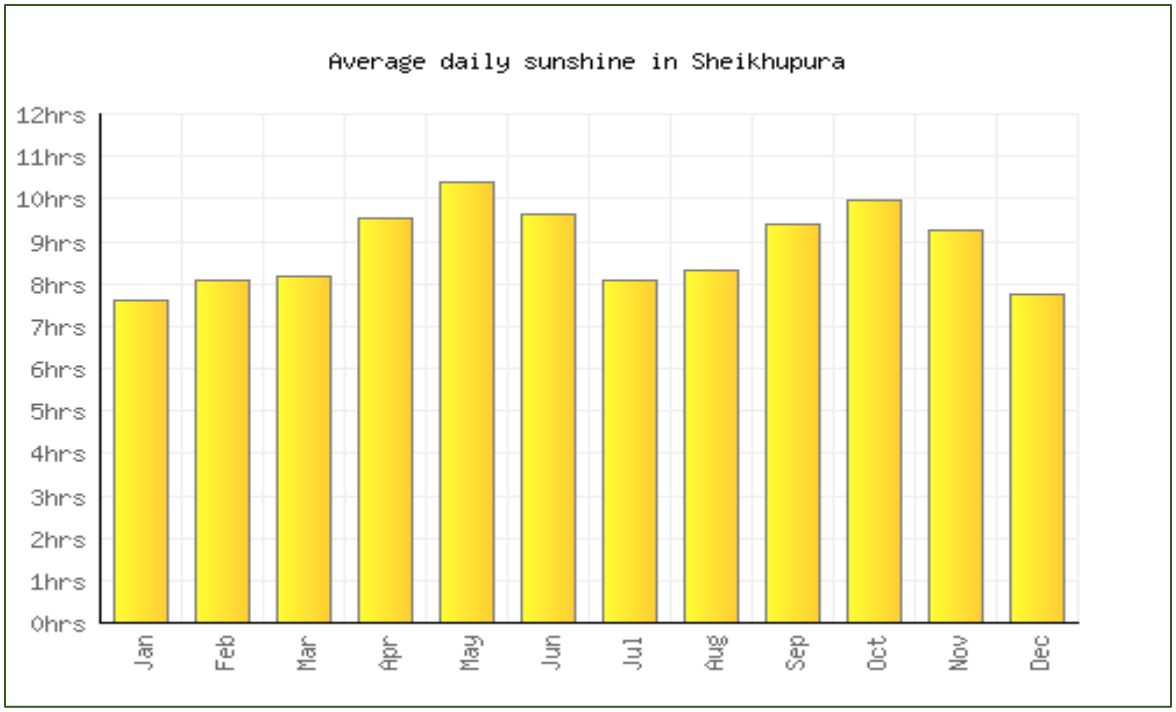


Figure 5-5 Average Sunshine in Sheikhupura

5.2.5 NEARBY DRAIN

The Kaloke Mirza Drain flows immediately adjacent to the terminal site. It is a small drainage channel that carries local runoff and contributes to the surrounding area's water management. The proximity of the drain has been considered in the terminal's design, with measures such as proper drainage networks, bund walls, and spill containment systems in place to prevent any potential contamination from terminal operations.

5.3 SEISMOLOGY

Sheikhupura lies in a low to moderate seismic zone of Pakistan and is not located near any major active fault line. Historical records show low earthquake frequency and intensity, with occasional tremors mainly originating from distant seismic sources.

Figure 5-6Nearby Drain

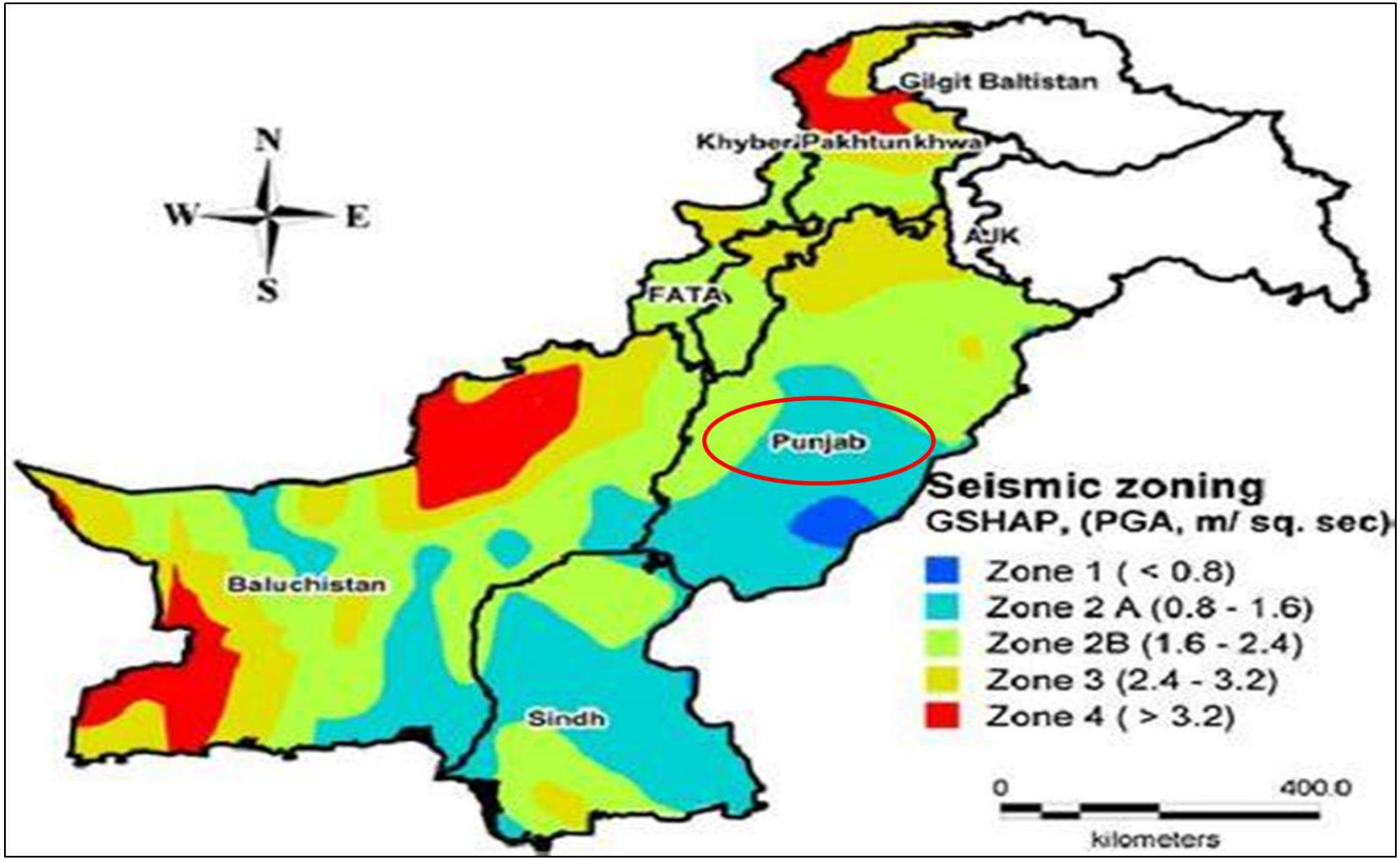


Figure 5-7 Seismic Zones of Pakistan

5.4 ECOLOGICAL RESOURCES

5.4.1 Flora

The project site of the terminal is located in a predominantly developed and industrial setting. Natural vegetation within the terminal premises is limited due to existing infrastructure such as storage tanks, pipelines, paved roads, and operational facilities. However, the extensive tree plantation have been carried out by the PARCO Gunvor Limited management as part of environmental management and aesthetic improvement measures. The planted vegetation mainly consists of commonly found, hardy, and native tree species suitable for the local climatic conditions of Sheikhupura District. These plantations serve as green belts and contribute to dust suppression, noise attenuation, and enhancement of the overall environmental quality of the site.

Figure 5-8Flora at the Project Site done by PARCO Gunvor Limited

Table 5-1Flora of the Project Area

Sr. No.	Name of the Plant	Scientific Name
Tree Species		
1.	**Shisham**	*Dalbergia sissoo*
2.	**Kikar**	*Acacia nilotica*
3.	**Neem**	*Azadirachta indica*

Sr. No.	Name of the Plant	Scientific Name
4.	**Jamun**	*Syzygium cumini*

5.4.2 Fauna

Due to extensive human activity and the conversion of land for industrial, agricultural, and residential use, the wildlife population in the project area is limited. Most species present are adaptable to disturbed or semi-urban environments and are commonly found in agricultural landscapes. Observations indicate that mammals are mostly small, such as rodents and stray domestic animals, while birds dominate the local fauna, including both resident and migratory species. The project site has low ecological sensitivity, and no endangered or protected species were recorded during site surveys.

Table 5-2Fauna of the proposed project

Common Name	Scientific Name
House Rat	*Rattus rattus*
Indian Palm Squirrel	*Funambulus palmarum*
Stray Dog	*Canis lupus familiaris*
House Sparrow	*Passer domesticus*
Common Myna	*Acridotheres tristis*
Rock Pigeon	*Columba livia*
Black Drongo	*Dicrurus macrocercus*
House Crow	*Corvus splendens*

5.4.3 Endangered Species

The endangered plant in Pakistan is the Elm i.e., Ulmus wallichiana which is not found here. No endangered species exist in the project area.

5.5 SOCIO-ECONOMIC ENVIRONMENT

5.5.1 History

Sheikhupura, located in the Punjab province of Pakistan, has a rich and diverse history dating back thousands of years. The region has been inhabited since ancient times, with archaeological evidence suggesting human settlements dating back to the Indus Valley Civilization, around 2500 BCE. Over the centuries, various empires and dynasties have ruled Sheikhupura, including the Mauryans, Kushans, Ghaznavids, and Mughals.

During the Mughal era, Sheikhupura gained prominence as a center of trade and culture. It was founded by Emperor Jehangir in 1607 and named after his beloved son, Prince Sheikhupura. The city flourished under Mughal rule, with the construction of notable landmarks such as Hiran Minar, a monumental tower built in memory of Emperor Jehangir's pet deer.

In the 18th and 19th centuries, Sheikhupura witnessed political upheavals and changing rulers, including periods of Sikh rule under Maharaja Ranjit Singh. After the British annexation of Punjab in the mid-19th century, Sheikhupura became a prominent administrative center in the British colonial administration.

Following the partition of India in 1947, Sheikhupura became part of Pakistan, and its demographics underwent significant changes due to migration and resettlement of refugees. Today, Sheikhupura is a thriving city with a diverse population, known for its agricultural economy, industrial growth, and cultural heritage. Despite its modernization and urbanization, the city's historical legacy is preserved in its monuments, landmarks, and cultural traditions, providing a glimpse into its rich and vibrant past.

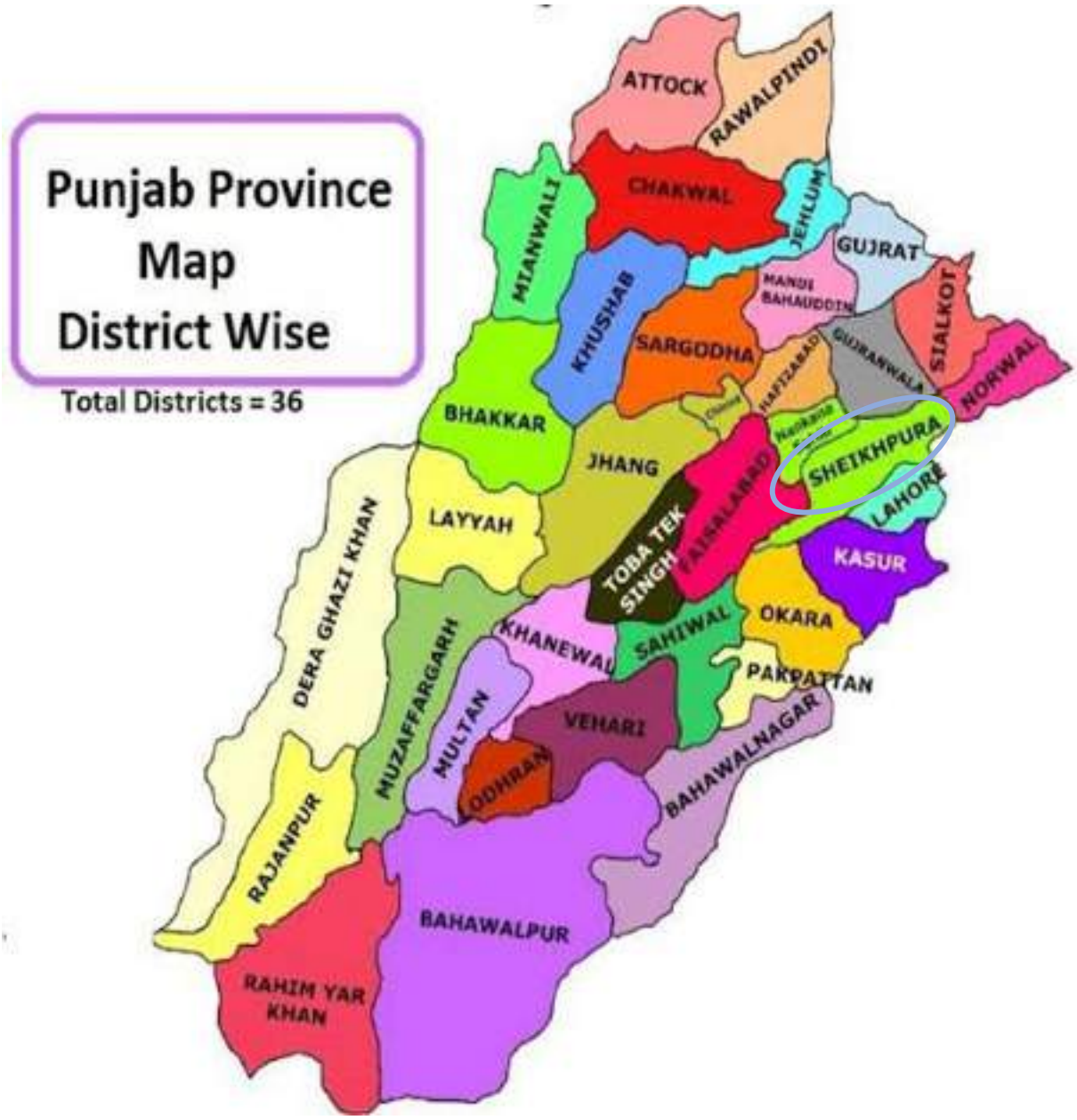


Figure 5-9District Map of Punjab

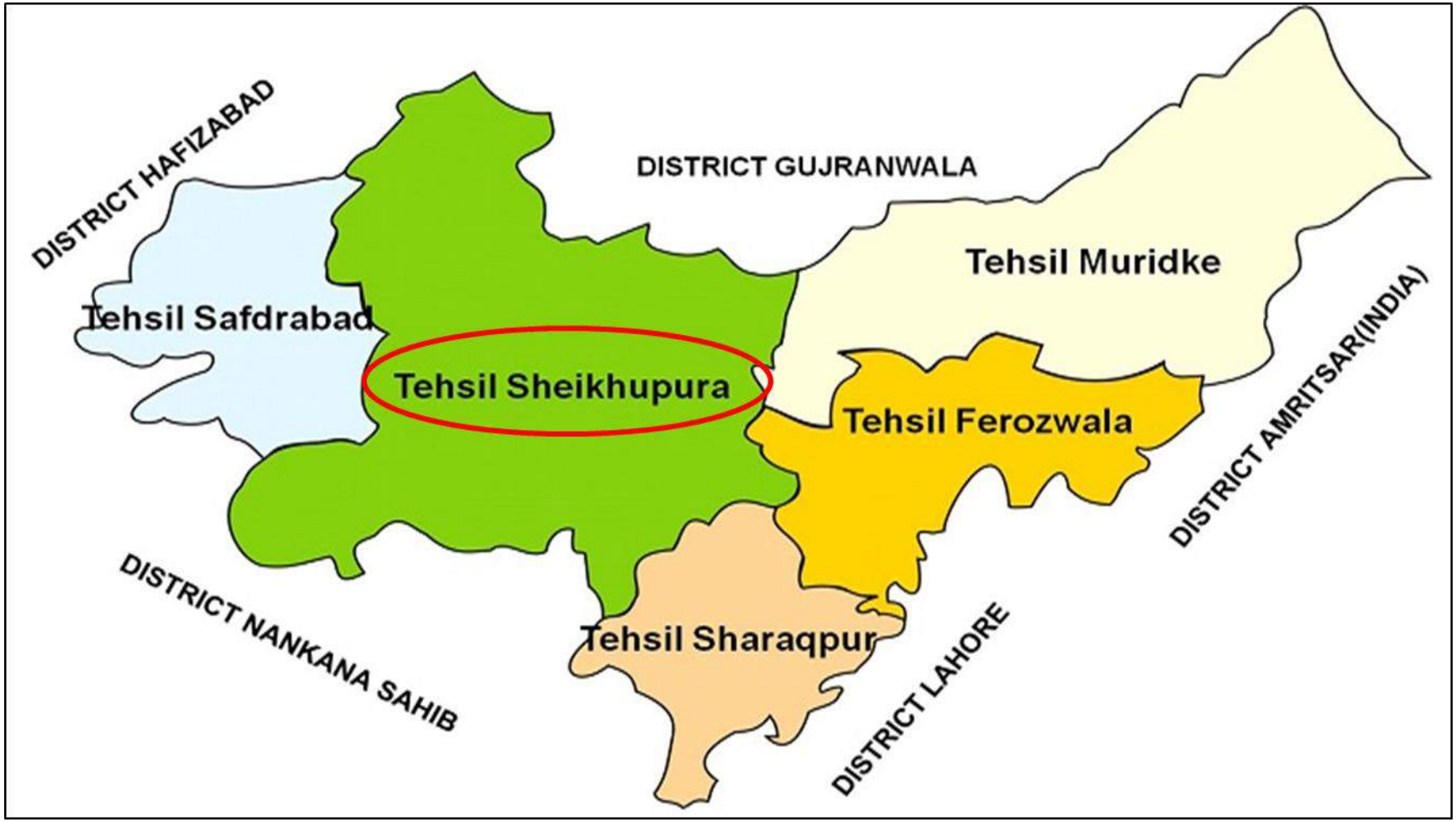


Figure 5-10Map of Sheikhupura

5.5.2 Political Set Up

Sheikhupura District falls under the administrative and political jurisdiction of the Government of Punjab. The area is represented at the provincial level by elected members of the Punjab Provincial Assembly and at the national level by members of the National Assembly of Pakistan. Local governance is managed through the district administration, including the Deputy Commissioner's office, municipal authorities, and relevant line departments responsible for planning, development, law and order, and public service delivery. The political setup in the project area is stable, with established administrative structures that facilitate coordination between government departments and industrial stakeholders. There are no known political sensitivities or conflicts in the vicinity of the PARCO Machike Terminal that could adversely affect project operations. The proponent maintains coordination with local authorities and regulatory agencies to ensure compliance with applicable laws, regulations, and social matters.

5.5.3 Economic Activities

The project site at PARCO Terminal Machike-02 is located within an established industrial and commercial zone, where economic activities are already dominated by energy and petroleum-related operations. The surrounding area hosts several bulk oil terminals and petroleum facilities, including PARCO Terminal Machike, Hascol Bulk Oil Terminal, Attock Petroleum Limited, Zoom Petroleum, Oilco Bulk Oil Terminal, and MT Oil Refineries, indicating a strong concentration of fuel storage, handling, and distribution activities. In addition, allied industrial units such as textile mills and power generation facilities are also present in the vicinity.

Figure 5-11Economic Activities Near PARCO Terminal

5.6 QUALITY OF LIFE VALUES

5.6.1 Demographic Survey

Sheikhupura's 2025 population is now estimated at 587,443. In 1950, the population of Sheikhupura was 29,186. Sheikhupura has grown by 14,593 in the last year, which represents a 2.55% annual change.

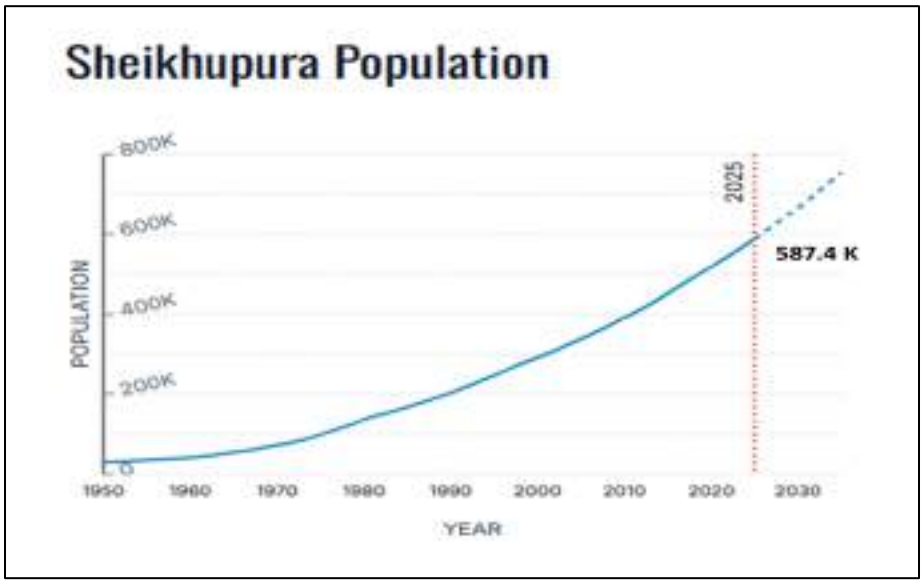


Figure 5-12Demography of the proposed project site

5.6.2 Cultural and Social Status

The project area falls within Sheikhupura District, which reflects a mix of rural and peri-urban socio-cultural characteristics. The local population primarily follows traditional Punjabi culture, with strong social ties, extended family systems, and community-based lifestyles. Agriculture, small trade, industrial labor, and services are the main sources of livelihood. Cultural practices are influenced by local customs, religious traditions, and seasonal festivals, with mosques serving as important social and religious centers. Literacy levels are gradually improving due to better access to educational institutions, while health and social services are increasingly supported by nearby urban centers.

5.6.3 Health Facilities

Adequate health facilities are available in the vicinity of the project site to cater for routine and emergency medical needs. The PARCO Machike Terminal is located within reasonable distance of Sheikhupura city, where major healthcare facilities such as DHQ

Hospital Sheikhupura and several private hospitals and clinics are present. These facilities provide emergency services, trauma care, outpatient treatment, and general medical support. In addition, local clinics along the Lahore–Sargodha Road offer first-aid and basic healthcare services. The availability of these health facilities ensures timely medical response in case of occupational incidents, emergencies, or health issues related to project operations.

Table 5-3Contact Number of Health Facilities Near Project Site

Name of the Nearby Medical Facility	Contact Number
Zarqa General Hospital	0300-4886871
Usman Clinic	0330-2262225
DHQ Hospital Sheikhupura	+92-56-9200231

Figure 5-13Health Facilities

5.7 ARCHEOLOGICAL SITES

A review of available records, consultations with local authorities, and field observations indicate that no notified or protected archaeological, historical, or cultural heritage sites are located within or in the immediate vicinity of the PARCO Gunvor Machike Terminal project area.

5.8 ENVIRONMENTAL MONITORING

Environmental monitoring at the PARCO Gunvor Machike Terminal is carried out to ensure compliance with applicable environmental regulations and to assess the effectiveness of existing mitigation measures. Monitoring includes periodic ambient air quality and noise level measurements at representative locations within and around the terminal, particularly near operational areas and the site boundary. Wastewater quality from domestic and operational sources is monitored prior to disposal to ensure compliance with PEQS.

5.9 SITE SUITABILITY

The site of the PARCO Gunvor Machike Terminal is considered suitable for the intended petroleum storage and distribution activities due to its established industrial land use, availability of essential infrastructure, and strategic location along a major transportation corridor. Adequate access roads, drainage facilities, firefighting systems, and safety measures are already in place, ensuring safe and efficient operations. In addition, temperature and climatic conditions of the area have been reviewed as part of site suitability considerations. Sheikhupura experiences typical semi-arid to sub-tropical climatic conditions, with high temperatures during summer and mild to cool winters, which are within the design and operational limits of petroleum storage facilities. The storage tanks are designed to safely withstand seasonal temperature variations, and internal floating roofs help minimize vapor losses during high-temperature periods. Operational procedures, material specifications, and safety systems are aligned with local temperature conditions to prevent thermal stress, product degradation, and excessive emissions. Additionally, the presence of controlled drainage, bunded tank areas, and environmental management systems enhances site safety and environmental protection.

6 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

6.1 GENERAL

The importance of impact assessment in EIA cannot be overstated, as it serves as a fundamental tool for evaluating and understanding the potential effects of a project on the environment. Impact assessment systematically identifies, predicts, and evaluates the anticipated positive and negative consequences of a project, considering various environmental aspects such as air and water quality, biodiversity, soil health, and community well-being. This process is pivotal in informed decision-making, enabling stakeholders to assess the trade-offs and make choices that balance development with environmental conservation. The impact assessment phase provides a comprehensive understanding of the project's potential impacts, allowing for the development of effective mitigation measures and strategies to minimize or eliminate adverse effects. Additionally, it fosters transparency and accountability by providing a basis for public consultation and engagement, ensuring that the concerns and perspectives of affected communities are considered. Overall, impact assessment in EIA is essential for promoting sustainable development practices, preventing environmental degradation, and fostering responsible and informed decision-making in the planning and execution of projects.

6.2 PROJECT AREA OF INFLUENCE

The project area of influence refers to the geographical zone within which the environmental and socio-economic impacts of the terminal could potentially occur during operational phases.

- The **primary area** of influence is confined to the terminal boundary itself, encompassing the storage tanks, pipelines, loading gantry, laboratory, administrative blocks, firewater tanks, internal roads, and greenbelt areas.
- The **secondary area** of influence extends to surrounding lands within approximately 1 km radius, which may experience indirect impacts such as traffic emissions, noise from transportation and generators, or minor air quality changes due to vapor emissions.

Socio-economic impacts, such as employment opportunities or minor disruptions from construction/maintenance activities, are also considered within this zone. The delineation of the project area of influence provides a basis for baseline data collection, impact assessment, and the design of appropriate mitigation measures to ensure minimal disturbance to the surrounding environment and communities.

6.3 METHODOLOGY FOR IMPACT ASSESSMENT

The methodology for the environmental impact assessment of the terminal was based on a systematic approach to identify, predict, and evaluate potential environmental and social impacts associated with the terminal's operations and minor maintenance/upgradation activities. The assessment focused on impacts arising from the storage, handling, and transfer of MS, HOBC, and HSD, as well as from supporting infrastructure such as pipelines, loading gantry, pumps, generators, and firewater systems.

The assessment was carried out using both primary data and secondary data.

- **Primary data** were collected through site visits, field observations, measurement of operational parameters, and consultations with terminal staff and local stakeholders.
- **Secondary data** were obtained from previous studies, PARCO Gunvor records, government reports, and relevant literature.

Each terminal activity was analyzed for potential interactions with environmental components, including air quality (VOC emissions), water resources, soil, noise, ecology, and socio-economic conditions of surrounding communities. Impacts were classified as positive or negative, direct or indirect, short-term or long-term, and their magnitude and significance were evaluated using qualitative and quantitative criteria. A baseline comparison approach was adopted to assess changes from existing conditions, and an Environmental Impact Matrix was used to link terminal activities with potential environmental effects. Mitigation measures were proposed to prevent, minimize, or offset adverse impacts.

- All the potentially significant environmental impacts from the project are grouped in the operational phase.

6.4 IMPACTS DURING OPERATIONAL PHASE

The operational phase of the PARCO Gunvor Machike Terminal involves the routine storage, handling, and dispatch of petroleum products, including MS, HOBC, and HSD. While the terminal is fully constructed and operational, certain environmental impacts are associated with ongoing activities. The facility implements continuous mitigation and monitoring measures to minimize these impacts and ensure compliance with environmental and safety standards.

The detailed risk Matrix of operational phase is shown in the table.

Table 6-1 Screening of possible impacts during operational phase

Potential Impacts	Likelihood (Certain, Likely, Unlikely, Rare)	Consequences (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)
Release of emissions	Likely	Moderate	Medium
Noise and vibration	Likely	Minor	Low
Wastewater Disposal	Likely	Moderate	Medium
Solid waste disposal	Likely	Minor	Low
Utility services & consumption of resources	Likely	Minor	Low
Fire hazards	Likely	Major	Significant

6.4.1 Release of Emissions

The operation of storage tanks, pumps, generators, and tanker movements generates continuous emissions, including volatile organic compounds (VOCs), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter. These emissions may affect local air quality and contribute to greenhouse gas emissions if not properly managed.

Mitigation Measures

- Ambient air quality is continuously monitored at key locations around the terminal to ensure compliance with PEQS.
- All operational equipment, including pumps, generators, and valves, undergoes routine maintenance, inspection, and calibration to maintain efficiency and minimize emissions.
- Storage tanks are equipped with internal floating roofs with double seals and vapor recovery systems to control fugitive emissions.
- Operational schedules are optimized to avoid peak emissions periods and coordinate maintenance activities to reduce cumulative impacts.
- Spill prevention and containment measures are in place to prevent accidental releases.

6.4.2 Noise and Vibration

Operational activities such as loading/unloading, vehicle movements, and machinery operation generate sustained noise and vibrations, which can affect nearby communities and terminal staff.

Mitigation Measures

- Noise levels are monitored regularly to ensure compliance with regulatory limits.
- Generators, pumps, and other machinery are equipped with silencers and maintained routinely to reduce noise and vibrations.
- Vegetation buffers and green belts around the terminal act as acoustic barriers, reducing noise transmission to surrounding areas.
- Operational procedures are designed to limit simultaneous high-noise activities.

6.4.3 Wastewater Disposal

- Sanitary wastewater from washrooms, minor laboratory effluent, and minor process water may contaminate soil or nearby water bodies if untreated.
- Mitigation Measures
- Wastewater is collected and treated through septic tanks or other approved treatment systems before disposal.
- Periodic inspections and maintenance ensure the proper functioning of treatment facilities.
- Effluent quality is continuously monitored to comply with PEQS standards.
- Any deviations or malfunctions are immediately addressed to prevent environmental contamination.

6.4.4 Solid Waste Management

Operational solid waste, including domestic, packaging, and minor process waste, may pose sanitation and environmental concerns if not properly managed.

Mitigation Measures

- For waste management at the PARCO Gunvor Machike Terminal, **WM Solution** is the designated company responsible for the collection, segregation, transport, and proper disposal of all operational and hazardous waste in compliance with regulatory standards.
- Waste is segregated into recyclable, compostable, and non-recyclable categories.
- Domestic and general waste is disposed of at approved sites through licensed contractors.
- Staff are trained regularly on proper waste handling procedures.
- Waste minimization practices are implemented to reduce generation at the source.

6.4.5 Utility Services and Resource Consumption

Operation of the terminal consumes electricity, water, and other resources, which can stress local utilities if not efficiently managed.

Mitigation Measures

- Energy-efficient pumps, lighting, and machinery are in use to minimize electricity demand.
- Water-saving measures, including recycling and controlled use, are applied throughout the facility.
- Periodic monitoring and audits of resource consumption optimize efficiency and prevent wastage.
- The terminal utilizes a 190 kWh on-grid solar system to reduce dependence on conventional energy sources.

6.4.6 Fire Hazards

The storage of flammable fuels and operation of machinery presents potential risks of fire incidents, which could endanger staff and the surrounding environment.

Mitigation Measures

- Fire detection, alarm, and suppression systems, including foam-based systems, hydrants, and portable extinguishers, are installed and maintained.
- Regular fire drills and emergency preparedness exercises are conducted for all operational staff.
- Standard Operating Procedures (SOPs) for fire safety, including emergency shutdown systems (ESD), are strictly followed.
- Fire risk assessments are conducted periodically, and any identified gaps are addressed immediately.
- Firewater tanks, bunded tank areas, and access to emergency response teams ensure rapid containment of incidents.

6.4.7 Oil Spillage

During the operation phase, activities such as oil transportation, storage of petroleum products, and loading/unloading are prone to potential hazards like oil spillage. Spillage may occur due to corrosion, mechanical faults, operational faults (e.g., over-pressurization), or natural hazards such as earthquakes.

- Oil storage tanks are surrounded by adequate dyke walls designed as per international standards.
- A regular maintenance and inspection program is in place to ensure safe operations.
- Geo-membrane liners are installed under tank foundations to prevent soil and water contamination.
- API separators are provided to separate and recover oil in case of spillage.
- Loading operations are conducted through a closed-mouth wall system to minimize spill risks.
- Only trained personnel handle loading and decanting activities.
- Access to oil storage tank areas is restricted to dedicated trained technical staff.
- An oil spill response plan, including procedures and responsibilities, has been implemented to minimize soil and water contamination in the event of a spill or leakage.

6.4.8 Plantation

Extensive tree plantation within the project site has been implemented to improve the local environment and provide cooling effects.

6.4.9 Traffic Management

The terminal has dedicated parking spaces for tankers, employees, and visitors. This arrangement reduces parking issues and prevents congestion in and around the project area.

Mitigation Measures

- Entry and exit points are kept free from obstruction.
- No off-site parking is allowed.
- "No Parking" signages are installed at critical locations

6.4.10 Socio-Economic Activity

The project has a positive impact on the local socio-economic environment by generating employment opportunities and improving livelihoods in the surrounding communities.

During the operational phase, the terminal employs approximately 30-40 people, including both direct and indirect employment. Direct employment includes operational staff, technical staff, security personnel, and housekeeping staff, while indirect employment encompasses supervisors, drivers, helpers, and other supporting personnel.

This employment generation contributes to local income, enhances skill development, and provides stable job opportunities for the community. Priority has been given to hiring local residents wherever possible, which helps in promoting community participation and socio-economic growth in the area.

In addition to employment, the project indirectly benefits local businesses, including transport operators, catering services, and suppliers of various goods and services, thereby stimulating economic activity in the region. Training programs and skill enhancement initiatives are also provided to employees to ensure safe operations, improve productivity, and empower staff with technical expertise.

7 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

An Environmental Management and Monitoring Program (EMMP) is a crucial component of an EIA because it serves as a systematic framework to ensure the effective implementation of mitigation measures and compliance with environmental regulations. The EIA process identifies potential environmental impacts of a proposed project, and the EMMP is designed to address and manage these impacts throughout the project's lifecycle. By establishing a comprehensive monitoring program, authorities can track the environmental performance of the project in real-time, allowing for timely identification and response to any unforeseen adverse effects. Additionally, the EMMP provides a mechanism for ongoing evaluation and adjustment of mitigation measures, contributing to adaptive management strategies. This proactive approach enhances environmental sustainability, helps prevent or minimize negative impacts, and fosters continuous improvement in environmental performance, thereby promoting responsible and sustainable development practices.

7.1 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The objectives of an EMP generally revolve around the following key goals:

- To ensure compliance with PEPA 1997, Punjab EPA regulations, and applicable environmental quality standards.
- To identify, prevent, minimize, and control potential adverse environmental impacts during the and operational phases of the project.
- To establish clear roles and responsibilities for effective implementation of environmental mitigation measures.
- To protect air quality, water resources, soil, and noise environment from potential impacts associated with fuel storage, handling, and transportation.
- To prevent environmental contamination through effective spill prevention, control, and emergency response measures.
- To ensure safe handling and storage of MS, HOBC, and HSD by adopting best industry practices.

- To safeguard occupational health and safety of workers through training, use of PPE, and emergency preparedness.
- To promote efficient use of resources, including energy and water, and encourage the use of renewable energy such as the 190 kWh on-grid solar system.
- To enhance environmental performance through regular monitoring, reporting, and corrective actions.
- To promote sustainable operation of the PARCO Gunvor Limited Machike Terminal-2 while minimizing risks to surrounding communities and the environment.

7.2 INSTITUTIONAL CAPACITY

The PARCO Gunvor Limited Machike Terminal has a well-established institutional capacity to manage environmental, health, and safety aspects of its operations. The terminal is staffed with trained personnel, including an Environmental Manager, EHS Officers, operational supervisors, and maintenance teams, all responsible for implementing the Environmental Management Plan (EMP) and Occupational Health & Safety (OHS) measures. Staff are trained in areas such as spill response, firefighting, emergency preparedness, waste management, and routine monitoring of air, water, and soil quality. The terminal also has access to specialized consultants and contractors for environmental assessments, waste treatment, and safety audits when required. Infrastructure and equipment, such as firewater tanks, firefighting systems, spill kits, and monitoring devices, complement the institutional capacity to ensure compliance with environmental regulations and promote operational safety. Coordination mechanisms with local authorities, regulatory bodies, and emergency services further enhance the capacity to respond effectively to incidents, maintain compliance, and ensure sustainable operation of the facility. Overall, the institutional setup at the terminal is capable of supporting all EMP, OHS, and operational requirements.

7.3 SCOPE OF ENVIRONMENTAL MANAGEMENT PLAN

The EMP outlines the measures required to prevent, minimize, and control the potential environmental impacts associated with the project.

7.4 MITIGATION PLAN FOR OPERATION PHASE

Table 7-1 Environmental Management Plan (EMP) for Operational Phase

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
1	**Air Quality** VOC emissions from MS, HOBC, and HSD tanks; exhaust from generators	Use of IFRs with double seals is used in storage tanks to reduce evaporative losses in tanks Regular inspection and maintenance is ensured. VOC emissions from valves, pumps, rotating equipment, and pipeline connections are minimized through proper design, maintenance, and leak detection. Vapor recovery systems are installed at the terminal for tanker loading/unloading	Throughout the operation phase	Operations Supervisor / EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
		to control fugitive emissions. Cathodic protection and 3LPE coating on pipelines to reduce corrosion and minimize emissions. Preventive maintenance and regular ambient air monitoring are carried out.		
2	**Noise** Noise from pumps, generators, and vehicle movement	Soundproof enclosures for generators will be maintained regularly to reduce noise generation. All engines, pumps, compressors, and generators will be fitted with silencers. Operational areas will have noise barriers where required.	Throughout the operation phase	Operations Supervisor / EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
		Occupational hearing protection is provided to staff working in noisy areas. Regular noise monitoring is carried out.		
3	**Wastewater Management**	Wastewater from washrooms is disposed of via septic tank system Separate stormwater and oily water drainage systems are maintained. Oil-water separators are installed for the treatment of wastewater from loading/unloading and the tank area. Treated wastewater will comply with PEQS before discharge.	Throughout the operation phase	EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
		Regular monitoring of water quality is ensured.		
4	**Fire and Explosion Risk Management**	Firewater tanks, hydrants, foam systems, and portable fire extinguishers are installed and maintained. Storage tanks are fitted with pressure-vacuum valves and flame arrestors. Firefighting equipment is routinely inspected and tested. A site-specific Emergency Response Plan (ERP) is in place and implemented.	Throughout the operation phase	Operations Supervisor/ EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
5	**Occupational Health and Safety (OHS)**	Mandatory use of PPE is enforced across the terminal. Regular safety training, toolbox talks, and refresher sessions are conducted. MSDS, safety signage, and warning notices are displayed at appropriate locations. Incident and near-miss reporting procedures are actively followed.		EHS Officer
6	**Emergency Preparedness**	Emergency and fire drills are conducted periodically. Evacuation routes, assembly points, and emergency contact information are clearly displayed.	Periodic/Continuous	EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
		Coordination with local fire brigade and emergency services is maintained. Alarm and communication systems are operational		
7	**Solid and Hazardous Waste Management**	Solid waste is segregated at source. Oily rags, spent filters, drums, and contaminated materials are stored in designated areas. Waste is disposed of through licensed WM Solutions. Waste handling and disposal records are maintained.	Routine	EHS Officer

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
8	**Employment and Social Environment**	The terminal provides continuous employment to technical, operational, and safety staff. Indirect employment is generated through transporters, suppliers, and service providers. Local workforce is engaged where feasible.	Operational phase	PARCO Gunvor Limited Management
9	**Traffic and Transport Safety**	Movement of fuel tanks is scheduled and controlled. Designated access routes are used for tanker traffic.	Operational phase	Transport Supervisor / EHS Manager

Sr. No.	Project Component/ Impact	Mitigation/ Preventive Action	Responsibility	
			Implementation	Monitoring
Operational Phase				
		Only trained and licensed drivers are allowed to operate fuel tankers. Speed limits, warning signage, and safety procedures are enforced. Coordination with local authorities is maintained when required.		

7.5 ENVIRONMENTAL MANAGEMENT TEAM ALONG WITH THEIR ROLES AND RESPONSIBILITIES

The PARCO Gunvor Machike Terminal-2 has an established Environmental Management Team (EMT) responsible for the effective implementation, monitoring, and continual improvement of environmental, health, and safety (EHS) practices during the operational phase of the project. The team ensures compliance with the Punjab Environmental Protection Act (PEPA) 1997, applicable rules and regulations, and internal PARCO standards. Clear roles and responsibilities are assigned to ensure efficient environmental management, risk control, and emergency preparedness.

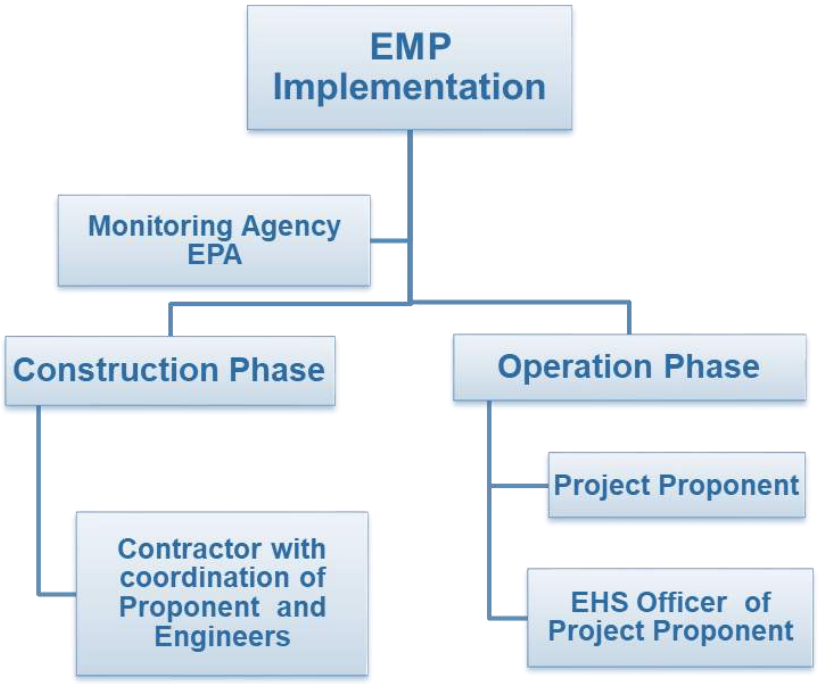


Figure 7-1Organogram for implementation Environmental Management Plan (EMP)

Table 7-2Roles & Responsibilities

Personals	Responsibilities
Terminal Manager	Overall, in-charge of environmental, health, and safety performance at the terminal. Ensures implementation of the Environmental Management Plan (EMP) and compliance with regulatory requirements. Allocates resources for environmental monitoring, maintenance, and training. Liaises with regulatory authorities and corporate management
EHS Manager	Oversees day-to-day implementation of environmental and safety measures. Conducts environmental monitoring (air, noise, wastewater) and maintains records. Ensures proper waste management, spill prevention, and pollution control practices. Organizes EHS training, toolbox talks, and awareness programs for staff. Investigates incidents, near-misses, and ensures corrective actions.
Operations Supervisor	Ensures environmentally sound operation of tanks, pipelines, pumps, and loading facilities. Implements SOPs related to product handling, spill prevention, and emergency response. Coordinates routine inspections and preventive maintenance of operational equipment.

Personals	Responsibilities
Maintenance Team	Carries out scheduled maintenance of tanks, pipelines, pumps, generators, and pollution control systems. Ensures integrity of bund walls, impermeable flooring, drainage systems, and firefighting equipment. Reports any defects, leaks, or abnormal conditions for immediate rectification.
Transport Supervisor	Manages movement of fuel tanks and tanker operations. Ensures drivers are trained, licensed, and comply with traffic and safety regulations. Enforces speed limits, route discipline, and safe loading/unloading practice
Contractor	Undertake development of the facility in accordance with the contract signed with the PARCO. Adhere to Proponent HSE policies, procedures, and other requirements while undertaking the Project. Implement aspects of EMMP assigned to them
All Employees and Contractors	Follow environmental, health, and safety procedures and instructions. Use PPE and report unsafe conditions, spills, or incidents immediately. Participate in training programs and emergency drill

7.6 ENVIRONMENTAL MONITORING PROGRAM

The Environmental Monitoring Program at the terminal is an integral part of ongoing operations and is already being implemented to ensure continuous compliance with the PEQS, PEPA-1997, and internal PARCO EHS requirements. The program focuses on

regular monitoring of key environmental parameters to verify the effectiveness of existing control measures, identify any deviations at an early stage, and ensure timely corrective actions.

Monitoring activities are carried out during routine operations through a combination of in-house inspections and EPA-Certified Laboratory. All monitoring results are properly documented, reviewed by the Environmental/EHS Manager, and reported to management and regulatory authorities as per statutory requirements. The program primarily covers air quality, noise levels, wastewater quality, solid waste management, soil protection, and occupational health and safety.

The objectives of the Environmental Monitoring Plan are given below;

- To ensure continuous compliance with the PEQS and applicable environmental regulations during terminal operations.
- To regularly monitor air quality, noise levels, wastewater, and waste management practices to confirm the effectiveness of existing control measures.
- To detect any potential environmental issues such as leaks, spills, or abnormal emissions at an early stage and enable timely corrective actions.
- To assess the performance of operational, safety, and environmental management systems already in place at the terminal.
- To ensure protection of soil, groundwater, and surrounding environment from contamination due to fuel handling and storage activities.
- To support informed decision-making by maintaining proper records of monitoring results and trends over time.
- To promote a culture of environmental responsibility and continuous improvement among terminal staff and contractors.

Table 7-3 Monitoring Parameters

Environmental Component	Monitoring Parameters	Monitoring Location	Monitoring Frequency	Responsibility
Ambient Air Quality	PM_{10}, $PM_{2.5}$, SO_2, NOx, VOCs	Terminal boundary and sensitive locations	Quarterly	Environmental / EHS Manager
Stack / Generator Emissions	CO, NOx, smoke opacity	Generator exhaust points	Quarterly	Environmental / EHS Manager
Noise Levels	dB(A)	Generator area, pump house, terminal boundary	Quarterly	Environmental / EHS Manager
Wastewater Quality	Oil & grease, pH, TSS	Oil-water separator outlet / septic tank	Quarterly	Environmental / EHS Manager
Solid & Hazardous Waste	Waste type, quantity, disposal method	Designated waste storage areas	Continuous / monthly review	EHS Manager
Groundwater	----	Tank farm, pipelines, loading areas	Quarterly	Environmental / Maintenance Team
Occupational Health & Safety	PPE usage, exposure to noise and vapors	Operational areas	Daily	EHS Manager
Emergency & Spill Response	Availability and condition of spill kits, firefighting systems	Tank farm, loading gantry	Monthly	EHS Manager

7.7 ENVIRONMENTAL RECORDS

Following environmental record should be maintained:

- Periodic inspection reports of the site
- Audit report
- Incident record of all moderate and major spills and other incidents, and accidents.

8 OCCUPATIONAL HEALTH AND SAFETY PLAN

8.1 BACKGROUND

The Occupational Health and Safety (OHS) Plan for the terminal has been developed to ensure the safety, health, and well-being of all personnel, contractors, and visitors associated with the terminal's operations. The terminal handles flammable petroleum products, including MS, HSD, and HOBC, and involves activities such as tank storage, pipeline operations, loading/unloading, and routine maintenance, all of which present potential occupational hazards.

8.2 OBJECTIVES

- To ensure the health, safety, and welfare of all employees, contractors, and visitors at the terminal.
- To identify, assess, and control occupational hazards associated with storage, handling, and transfer of petroleum products (MS, HSD, HOBC).
- To ensure compliance with national laws, industry standards, and international best practices related to occupational health, safety, and environmental protection.
- To establish proactive emergency preparedness measures, including fire prevention, spill response, and accident management.
- To implement continuous monitoring, reporting, and corrective actions for all safety and environmental aspects of terminal operations.
- To foster a safety culture, ensuring all personnel are aware of potential risks and adhere to safe work practices and procedures.
- To minimize the risk of accidents, injuries, or environmental incidents, thereby protecting human life, property, and the surrounding people.
- To promote training and capacity building for all staff on occupational health, safety, and environmental protection.

8.3 REGULATORY REQUIREMENTS

The OHS Plan at terminal is developed in compliance with relevant national legislation, standards, and industry best practices to ensure the protection of personnel, contractors, and the environment.

Table 8-1Rules and Regulations

Laws, Regulations, and Polices	Detail Description
Pakistan Factories Act, 1934	Ensures worker safety, health, and welfare in industrial establishments. Requires provision of safe working conditions, first aid facilities, and safety measures for machinery and hazardous processes.
Pakistan OHS Act 2018	Provides guidelines for risk assessment, safety management systems, and occupational hazard controls. Establishes employer responsibilities for employee safety training and protective equipment.
Environmental Protection Act, 1997 (PEPA)	Ensures environmental compliance related to hazardous substance handling, waste management, and emissions, indirectly supporting OHS through safe operations.
National Fire Protection Standards (NFPA) and Oil & Gas Safety Guidelines	Provides standards for storage, handling, and transportation of flammable and combustible products. Requires fire suppression systems, emergency response planning, and safe tank operations.
ISO 45001 -Occupational Health and Safety Management System	Framework for systematic identification, assessment, and management of workplace hazards.

Laws, Regulations, and Polices	Detail Description
	Encourages continual improvement in safety performance and risk reduction.

8.4 ENVIRONMENTAL, HEALTH, AND SAFETY MONITORING & RECORD KEEPING

Table 8-2Monitoring & Record Keeping

Monitoring / Record Type	Purpose	Key Fields / Contents	Frequency / Responsibility
Damage & Corrective Measures Register	Track any damage to vegetation, water resources, or community assets and ensure corrective actions	Date & Time, Location, Description of Damage, Cause, Corrective Measures, Responsible Person, Verification	Monthly / EHS Officer
Monitoring Records	Track environmental compliance	Ambient air, water and noise monitoring reports and submissions	Environmental Monitoring Team/ EHS Officer
Waste Tracking Register	Record waste generated, recycled, reused, or disposed	Date, Type of Waste, Quantity, Disposal / Reuse / Recycling Method, Vendor / Disposal Site, Responsible Person	Monthly / EHS Officer
Public Infrastructure /	Record damages to public infrastructure and compensation	Date & Location, Type of Infrastructure, Description of	As Occurred / Project Manager & EHS Officer

Monitoring / Record Type	Purpose	Key Fields / Contents	Frequency / Responsibility
Vendor Impact Register		Damage, Responsible Vendor, Corrective Action / Compensation, Verification by Authority	
Employment Record	Track workforce and local employment benefits	Date / Project Phase, Job Type (Skilled / Semi-skilled / Unskilled), Employee Name, Domicile, Duration, Department / Work Are	Monthly / HR Department
Environmental & Social Training Records	Track staff training on EHS and environmental compliance	Training Date, Topic, Trainer	Monthly
Complaints Register	Record complaints and community engagement	Date, Complainant Name & Contact, Nature of Complaint, Action Taken, Responsible Officer, Status (Open / Closed)	As Occurred / GRM Officer & EHS Officer

8.5 POTENTIAL IMPACTS AND MITIGATION MEASURES

Table 8-3Potential Impacts and Mitigations for OHS and ERP

Hazard	Potential Impacts	Mitigation Measures
Chemical Exposure		
VOCs released from storage tanks, pipelines, and product handling.	Respiratory irritation, long-term health risks for terminal staff, environmental pollution.	IFRs with double seals installed on all tanks to minimize evaporative emissions. Vapor Recovery Systems deployed at loading/unloading points to capture fugitive emissions. Mandatory use of PPE, including respirators, gloves, and protective clothing, for personnel working in high-exposure areas. Regular ambient air monitoring to ensure compliance with PEQS standards.
Fire and Explosion		
Storage and handling of flammable products (MS, HSD, HOBC).	Major fire or explosion resulting in injuries, fatalities, property damage, and environmental contamination.	Firewater tanks and foam-based firefighting systems with hydrants and sprinklers. Flame arrestors, pressure/vacuum relief valves, and emergency

Hazard	Potential Impacts	Mitigation Measures
		shutdown systems (ESD) installed on all tanks and pipelines. Emergency Response Plan (ERP) implemented and periodically rehearsed. Periodic fire drills and safety training for staff.
Mechanical Hazards		
Operation of pumps, pipelines, valves, and associated machinery.	Injuries due to malfunction, or accidental release of products.	Strict adherence to SOPs during operation and maintenance. Routine inspection and preventive maintenance of all mechanical equipment. Training personnel on safe operating procedures and hazard awareness.
Noise		
High noise levels from generators, pumps, compressors, and tanker operations.	Hearing loss, discomfort, and stress among terminal personnel.	Soundproof enclosures and acoustic barriers where necessary. Mandatory hearing protection (earplugs or

Hazard	Potential Impacts	Mitigation Measures
		earmuffs) for staff in high-noise areas. Regular noise level monitoring to ensure compliance with regulatory limits.
Traffic Hazards		
Movement of fuel tanks, within and around the terminal.	Road accidents, injuries, and damage to equipment or property.	Trained and licensed drivers for all tanker operations. Defined routes and speed limits for internal and external transportation. Signage, barriers, and designated lanes to separate vehicle and pedestrian traffic.

8.6 KEY PERFORMACE INDICATORS

Following are the KPI's of OHS Plan Implementation;

- Number of lost-time incidents
- Spill incidents
- PPE compliance
- Fire drill participation
- Safety audit score
- Waste disposal compliance

8.7 WORK PERMITS

A Work Permit System is implemented at the terminal to ensure that all hazardous, non-routine, and maintenance activities are carried out in a controlled and safe manner. The permit-to-work system applies to activities such as hot work, confined space entry, electrical work, working at height, excavation, and maintenance on tanks, pipelines, pumps, and other critical equipment. Each work permit is issued only after a thorough risk assessment has been conducted, hazards have been identified, and appropriate control measures, including isolation, gas testing, and PPE requirements, are confirmed. Permits are authorized by the designated competent authority and remain valid for a defined duration, after which they must be reviewed or revalidated. The system ensures clear communication between operations, maintenance, and safety personnel, helps prevent accidents, and ensures compliance with occupational health, safety, and regulatory requirements during all work activities at the terminal.

8.8 FIRE FIGHTING ARRANGEMENTS

The project site is provided with adequate and well-distributed firefighting equipment to ensure effective emergency response. Fire hydrants, water monitors, foam systems, and hose cabinets are installed at critical operational areas such as the tank farm, loading gantry, pump house, and administrative facilities. Portable fire extinguishers of appropriate types are placed in offices, workshops, electrical rooms, and high-risk locations. Mobile foam trolleys, sand buckets, and fire blankets further support rapid control of fuel-related fire incidents. All firefighting equipment is regularly inspected and maintained to ensure readiness at all times.

Table 8-4Fire Safety Arrangements

Equipment	Quantity	Location
Fire Water Monitors	02	Loading / Decanting Gantry Parking Area

Equipment	Quantity	Location
Fire Hydrants	08	Various locations including Admin Building, Parking, Tank Areas, Maintenance Workshop
Hose Cabinets	05	Admin Building, Maintenance Workshop, Loading Pump House, Gate House
Mobile Foam Trolleys	02	Tank-01, Tank-02, Loading/Decanting Gantry
Foam Skid	01	Tank-01, Tank-02
Portable Fire Extinguishers (ABC Dry Chemical)	14	Office, Workshop, Store, Transformer Room, Generator Room
Portable Fire Extinguishers (CO_2)	11	Generator Room, Transformer Room, Workshop, Office, Gate House
Fire Extinguishers (Trolley Mounted 50 kg)	02	Gantry
Sand Buckets	06	Pump House, Loading Gantry
Fire Blankets	02	Loading Gantry, Office Kitchen

Figure 8-1Fire Safety Arrangements

8.8.1 First Aid Kit

First aid facilities are available at the project site to ensure prompt medical response in case of minor injuries or emergencies. Well-equipped first aid kits are placed at strategic locations such as the administrative building, loading gantry, maintenance workshop, and security post. The kits contain essential medical supplies including bandages, antiseptics, gloves, and basic medicines. Designated staff members are trained in first aid and emergency response procedures. The first aid kits are regularly inspected and replenished to ensure their availability and effectiveness at all times.

Figure 8-2First Aid Kit

Incident/Spill Record Form-PARCO Gunvor Limited Machike Terminal-02

Incident Report No. _____ **Reported By:** _____

Date & Time of Incident: _____ **Location:** _____

Type of Incident

☐ Spill / Leak ☐ Fire / Explosion ☐ Injury (LTI / LWI) ☐ Property Damage

Others _____

Details of Incident

Parameter	Details
Material / Substance Involved	_____
Estimated Quantity / Severity	_____
Nature of Incident / Injury	_____
Immediate Cause	_____
Contributing Factors	_____

Impact Assessment

Aspect	Extent / Magnitude
Environmental (soil, water, air)	_____
Safety / Human (number injured, severity)	_____
Operational / Production	_____
Property / Equipment	_____

Response & Restoration Measures

Action Taken	Responsible Person / Team	Date and Time
Cleanup / Recovery	_____	_____
Medical Assistance / Rescue	_____	_____
Restoration / Remediation	_____	_____
Follow-up Monitoring	_____	_____

Photographic Evidence

	Description	Location	Date and Time
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____

Note:

Attach the Pictures with the form.

Prepared By _____

Verified By (EHS / Terminal Manager) _____

Date _____

OHS Checklist -PARCO Gunvor Limited Machike Terminal-02

Date of Inspection _____

Responsible Person's Name _____

Checklist Item	Status/ Remarks
Firefighting Equipment -Check firewater tanks, hydrants, foam systems, extinguishers, and hoses; ensure accessibility and functionality.	
Spill Kits & Absorbents -Confirm availability and proper placement at tanks, loading gantry, and maintenance areas; check stock levels.	
Tank & Pipeline Inspections -Conduct visual inspection for leaks, corrosion, structural damage, or unusual odors; verify integrity of valves and seals.	
Generators, Pumps & Compressors -Check operational status, noise levels, silencers, and vibration; ensure fuel/oil levels are adequate.	
Waste Storage Areas -Verify segregation of hazardous and non-hazardous waste; ensure proper containment and cleanliness.	
Personal Protective Equipment (PPE) -Confirm all operational staff, maintenance personnel, and contractors are wearing required PPE (helmets, gloves, boots, goggles, hearing protection).	
Vehicle / Tanker Movement -Ensure compliance with designated routes, speed limits, and traffic control measures; confirm drivers are trained and authorized.	
Emergency Communication Systems -Test alarms, PA systems, radios, and emergency contact availability.	
Hazardous Material Handling -Ensure safe storage, transfer, and handling of MS, Excellium, and HSD SOPs.	
Housekeeping & Workplace Cleanliness -Check that walkways, loading areas, control rooms, and maintenance zones are free from debris, spills, or obstructions.	
Bunds & Drainage -Inspect secondary containment, bund walls, and drainage channels for blockages or structural damage.	
Emergency Equipment & PPE Stocks -Confirm availability of first aid kits, breathing apparatus, gas detectors, and additional emergency gear.	
Work Authorization & Permits -Verify hot work permits, confined space entry permits, and operational clearances are in place.	
Incident & Near-Miss Records -Document any incidents, near-misses, or unsafe conditions observed; ensure timely reporting and corrective actions.	
Safety Signage -Inspect signage for clarity, visibility, and relevance in operational areas, pipelines, and storage tanks.	
Training & Awareness Reminders -Ensure daily reminders for staff regarding safety protocols, emergency response, and environmental precautions	

Note:

1. Any non-compliance or unsafe condition must be immediately reported to the Terminal Manager and EHS Officer.
2. Corrective actions should be logged and followed up the same day.

Signature:

_____

EHS Officer / Operations Supervisor

9 STAKEHOLDER CONSULTATION

Stakeholder consultation is a critical component of the Environmental Impact Assessment and Occupational Health & Safety planning process. It ensures that the concerns, expectations, and inputs of all parties potentially affected by the terminal operations are identified, recorded, and addressed. The consultation process helps in improving project planning, enhancing environmental and safety management measures, and social license to operate.

9.1 OBJECTIVES OF STAKEHOLDER CONSULTATION

Objective of Stakeholder Consultation are;

- To identify all relevant stakeholders, including government authorities, local communities, contractors, and employees.
- To understand potential environmental, social, and safety concerns associated with terminal operations.
- To provide a transparent platform for communication between the project proponent and stakeholders.
- To incorporate stakeholder feedback into project planning, mitigation measures, and OHS management strategies.
- To ensure compliance with legal and regulatory requirements regarding public participation.

Stakeholder consultation for the terminal is guided by national legislation to ensure public participation, transparency, and accountability in project planning and operations. Key regulatory requirements include:

- **Pakistan Environmental Protection Act (PEPA), 1997**
- **Occupational Health & Safety Regulations**

9.2 METHODOLOGY

The stakeholder consultation was carried out using a combination of primary and secondary approaches, including:

Site Visits: Observations of terminal operations, surrounding communities, and local infrastructure.

Review of Literature and Previous Reports: Secondary data on environmental and socio-economic conditions in Sheikhupura District.

Figure 9-1 Stakeholder Management

Figure 9-2Pictorial Evidences of Site Visits

9.3 IDENTIFIED STAKEHOLDERS

For effective environmental management, safety compliance, and engagement of people at the terminal, the following stakeholders have been identified:

Table 9-1 Stakeholders and Their Roles and Responsibilities

Stakeholders	Roles
PARCO's Management Team / Terminal Management	Their responsibilities extend to ensuring compliance with environmental regulations, occupational health and safety standards, and the implementation of the Environmental Management Plan (EMP). The management coordinates operational activities, risk mitigation measures, monitoring programs, emergency preparedness, and reporting to regulatory authorities.
Government Officers	Relevant government authorities play a regulatory and supervisory role. Key departments include the Environmental Protection Agency (EPA), municipal authorities, wildlife conservation departments, and planning and development authorities. These departments ensure that terminal operations comply with environmental legislation, land use

Stakeholders	Roles
	regulations, safety codes, and public welfare requirements. Regular inspections, permits, and approvals are coordinated with these agencies to maintain compliance.
Contractors / Vendors	Contractors and vendors are involved in construction, maintenance, pipeline operations, laboratory services, and the supply of equipment and materials to the terminal. Their activities directly impact operational safety and environmental performance. Effective engagement with contractors ensures adherence to occupational health and safety standards, proper handling of hazardous materials, and compliance with project environmental and social policies.
Employees / Terminal Staff	Operational and administrative personnel form the internal stakeholder group. This includes engineers, technicians, laboratory staff, drivers, security personnel, and administrative staff. Employees are directly involved in daily terminal operations and are responsible for following safety procedures, handling materials responsibly, reporting incidents, and implementing mitigation measures. Regular training, awareness programs, and active participation in safety initiatives are essential to safeguard both personnel and terminal operations.

9.4 DISCUSSED POINTS

Table 9-2Summary of Issues Raised by Stakeholders

Issue	Aspect / Concern Raised by Stakeholders	PARCO's Commitments
Air Quality and Emissions	Emissions from MS, HSD, and HOBC tanks, as well as from pumps, generators, and tanker operations, were discussed.	Already implemented measures include floating roofs, vapor recovery systems, and regular ambient air quality monitoring, ensuring compliance with PEQS.
Noise and Vibration	Noise from operational equipment, generators, and tanker movements was highlighted.	Silencers, soundproof enclosures, and natural noise barriers (green belts) are already in place. Operational practices minimize noise during sensitive hours
Fire and Explosion Hazards	Safety concerns related to storage and handling of flammable products (MS, HSD, HOBC).	Fire Safety Measures are already in place and will be maintained in future.
Solid Waste and Hazardous Waste Management	Proper storage, segregation, and disposal of solid and hazardous waste were discussed.	Waste management practices, licensed contractors (WM Solutions), and regular audits are already in place to ensure compliance.

9.5 OUTCOME OF DISCUSSIONS

- Stakeholder concerns were documented and integrated into the EMP and OHS Plan.
- Commitments were made for continuous monitoring, regular reporting, and proactive mitigation of environmental and safety impacts.
- A formal Grievance Redress Mechanism (GRM) was established to address any feedback promptly.

10 GRIEVANCE REDRESS MECHANISM

The GRM at the Machike Termina-02 is designed to provide a structured and transparent process for addressing concerns, complaints, and suggestions from stakeholders, including local communities, employees, contractors, and government authorities. The GRM ensures that grievances are recorded, assessed, and resolved in a timely and fair manner, promoting accountability, trust, and effective communication between the terminal and its stakeholders.

10.1 OBJECTIVES OF GRIEVANCE REDRESS MECHANISM

The key objectives of the GRM include:

- Providing a clear and accessible process for stakeholders to raise grievances related to environmental, social, safety, or operational issues.
- Ensuring that all complaints are recorded, acknowledged, and resolved promptly.
- Enhancing communication and transparency between PARCO, local communities, employees, and contractors.
- Supporting continuous improvement in environmental and occupational health and safety practices.
- Minimizing potential conflicts and maintaining social license to operate.

10.2 SCOPE OF COMPLAINT

The GRM covers complaints and concerns related to:

- Environmental impacts, such as air quality, noise, water, soil contamination, and tree or green belt management.
- Occupational health and safety issues for employees, contractors, and visitors.
- Traffic, tanker movements, and transport-related safety concerns.
- Solid and hazardous waste management and spill incidents.
- Any social, or operational impacts arising from terminal activities.

10.3 GRM STRUCTURE

Table 10-1GRM Structure

Level	Role / Responsibility
Level-01 **GRM Officer**	Receives grievances from stakeholders, logs complaints in the GRM register, acknowledges receipt, and attempts initial resolution within 7 working days.
Level-02 **EHS Officer**	Reviews unresolved or complex grievances from Level 1, investigates, implements corrective measures, and communicates outcomes within 15 working days.
Level-03 **PARCO's Senior Management**	Handles escalated grievances not resolved at Level 2, ensures compliance with legal and corporate policies, and reports outcomes to regulatory authorities if needed.

10.4 GRIEVANCE FILING PROCESS

Stakeholders can submit complaints via:

- GRM Forms available at the terminal office.
- In-person submissions at the terminal

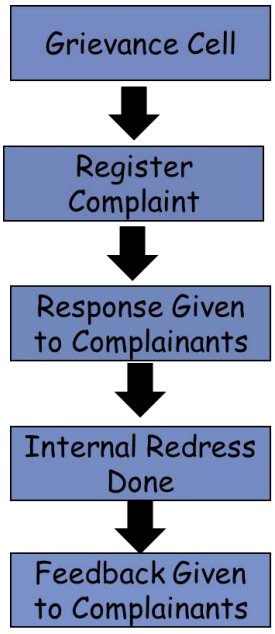


Figure 10-1 Grievance Redress Mechanism

10.5 MONITORING AND REPORTING

- All grievances and actions taken are logged in a GRM Register for internal tracking.
- Periodic reports are prepared by the EHS Manager for review by corporate management and regulatory authorities.
- The GRM ensures transparency, accountability, and timely resolution, with follow-up to verify effectiveness of corrective measures

GRM Complaint Form- PARCO Gunvor Limited Machike Terminal-02

Complaint No._____

Date of Submission _____

Complainant Details

Field	Details
Name of Complainant	_____
Gender	☐ Male ☐ Female ☐ Other
Age	_____
Contact Number	_____
Email (if available)	_____
Address	_____
Occupation	_____

Complain Details

Field	Details
Type of Complaint	☐ Environment ☐ Safety ☐ Social ☐ Property ☐ Others _____
Location / Area of Issue	_____
Date / Time of Incident	_____
Description of Complaint	_____
Immediate Action Taken	_____

Supporting Evidence

Field	Details
Photographs	☐ Attached ☐ Not Available
Documents / Receipts / Permits	☐ Attached ☐ Not Available
Witnesses	**Name(s) & Contact(s)** _____

Grievance Resolution Requested

Field	Details
Preferred Action / Remedy	_____
Any Additional Notes	_____

For Official Use

Field	Details
Date Received	_____
Received By	_____
Reference / Tracking No.	_____
Assigned to Responsible Officer	_____
Action Taken	_____
Resolution Date	_____
Status	_____
Remarks	_____

Signature of Complainant: _____

Signature of GRM Officer: _____

11 CONCLUSION AND RECOMMENDATION

11.1 CONCLUSION

The EIA of the project demonstrates that the site is suitable for the proposed development due to its strategic location, existing industrial land use, and availability of essential infrastructure. The assessment of environmental impacts across the operational phases indicates that potential negative effects are generally localized, temporary, and manageable with appropriate mitigation measures.

During the design phase, no significant environmental or social impacts were observed, as activities were primarily preparatory. In the operational phase, moderate impacts are associated with air emissions, noise, wastewater, solid waste, and utility consumption. Ongoing mitigation, monitoring, and adherence to environmental standards ensure these impacts remain within acceptable limits.

Overall, the project is environmentally sustainable, and the benefits of establishing the facility such as improved infrastructure, resource efficiency, and socio-economic development outweigh the manageable environmental risks.

11.2 RECOMMENDATIONS

To ensure continued environmental protection and compliance, the following recommendations are proposed:

- Maintain strict adherence to the EMP for the operational phases, including dust suppression, noise control, waste management, and wastewater treatment.
- Regular monitoring of air quality, noise levels, wastewater, and emissions should be conducted to ensure compliance with environmental standards and timely corrective actions if deviations occur.
- Conduct periodic training programs for staff and contractors to enhance environmental awareness and ensure proper implementation of mitigation measures.
- Maintain and regularly test fire safety, spill response, and emergency response systems to minimize risks associated with operational hazards.

- Optimize energy and water consumption through the use of energy-efficient equipment, water-saving practices, and periodic audits to reduce environmental footprint.
- Keep open communication with nearby communities and authorities to address concerns and ensure transparency regarding environmental management practices.

By following these recommendations, the project can operate sustainably, minimize environmental risks, and contribute positively to the ecosystem.

References

Listed below are some of the documents, reports and other references consulted during the preparation of this report:

1. Information and data provided by project proponents;
2. Project Pre-Feasibility Study Report;
3. Technical Design Data related to the project.
4. Information gathered through discussions with the project related persons of the project proponent;
5. Information collected from the technical documents of various suppliers of machinery/equipment.
6. National Environment Quality Standards for Ambient Air August 2016;
7. Punjab Environment Quality Standards Noise Levels August 2016;
8. Punjab Environment Quality Standards for Drinking Water August 2016:
9. Pakistan Environmental Protection Act, 1997;
10. The Punjab Environmental Protection (Amendment) Act 2012 covers aspects related to:

- The protection, conservation, rehabilitation and improvement of the environment and the prevention, control of pollution and promotion of sustainable development;
- Establishing complete regulatory and monitoring bodies, policies, rules, regulations and national environmental quality standards; and
- To ensure enforcement, the act establishes regulating bodies i.e. Punjab Environmental Protection Council (PEPC) and responsible bodies i.e. Punjab Environmental Protection Agency (Punjab EPA) at Provincial level.

i. Environment related Laws in Pakistan and the Province of Punjab;
ii. Government of Pakistan, Pakistan Environmental Protection Agency, Policy and Procedures for Filing, Review and Approval of Environmental Assessment, 2022;
iii. Google earth, maps.
iv. Guidelines for Public Consultations - These guidelines cover:

- Consultation, involvement and participation of Stakeholders
- Techniques for public consultation (principles, levels of involvements, tools, building trust)
- Effective public consultation (planning, stages of EIA
- where consultation is appropriate)
- Consensus building and dispute resolution.

1. workplace safety and health act 2011
2. Land Acquisition Act (LAA) of 1894
3. The forest Act 1927
4. Pakistan Penal Code, 1860
5. Provincial Wildlife Act, 1974
6. Drugs Act 1976

Term of References

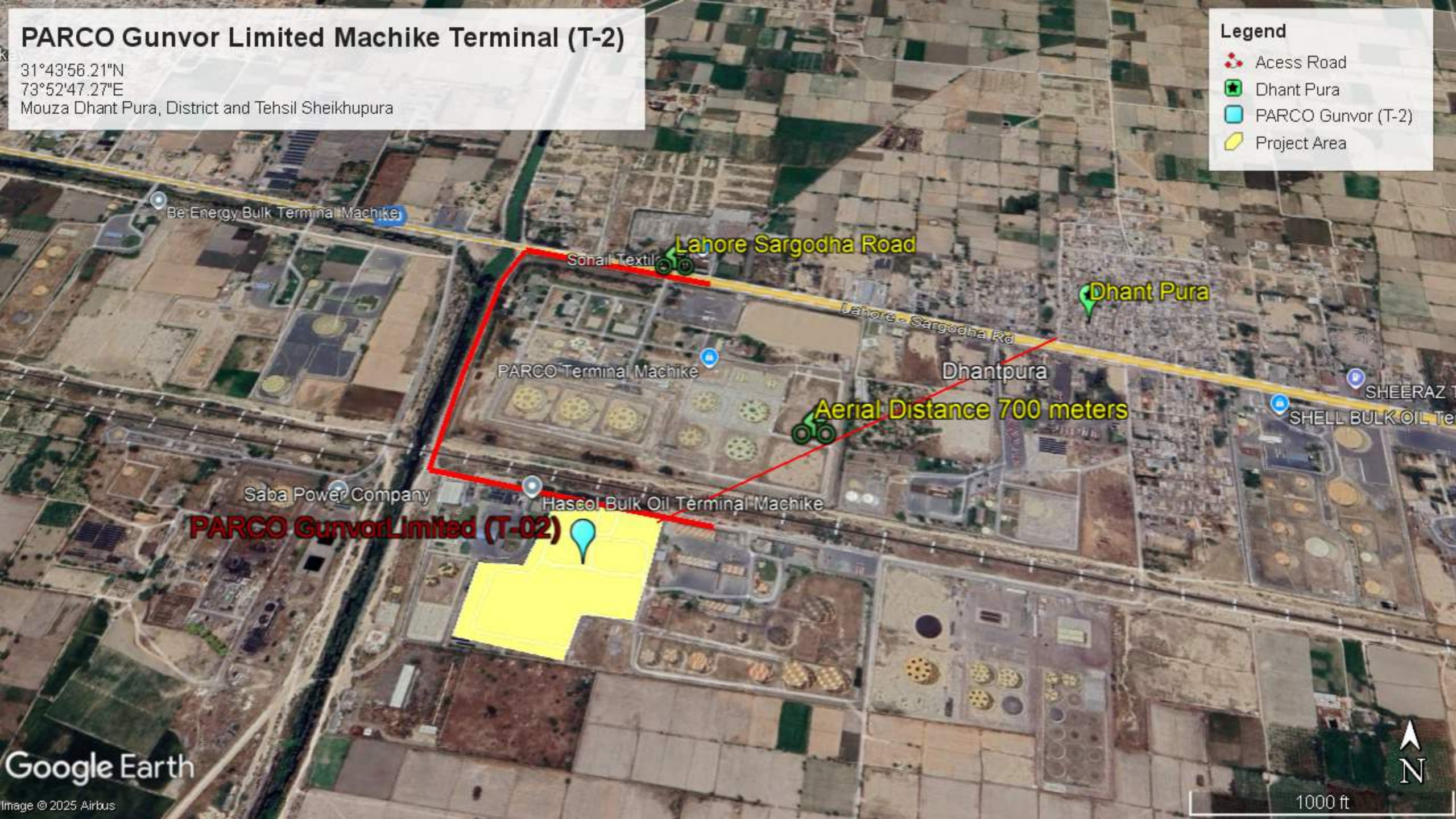
1. The Consultant is required to carry out an Environment Assessment Study of the Project as required under section 12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection Act 2012.
2. The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincial's laws & regulations including but not limited to:

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

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

ANNEXURE-A

Google Earth Map

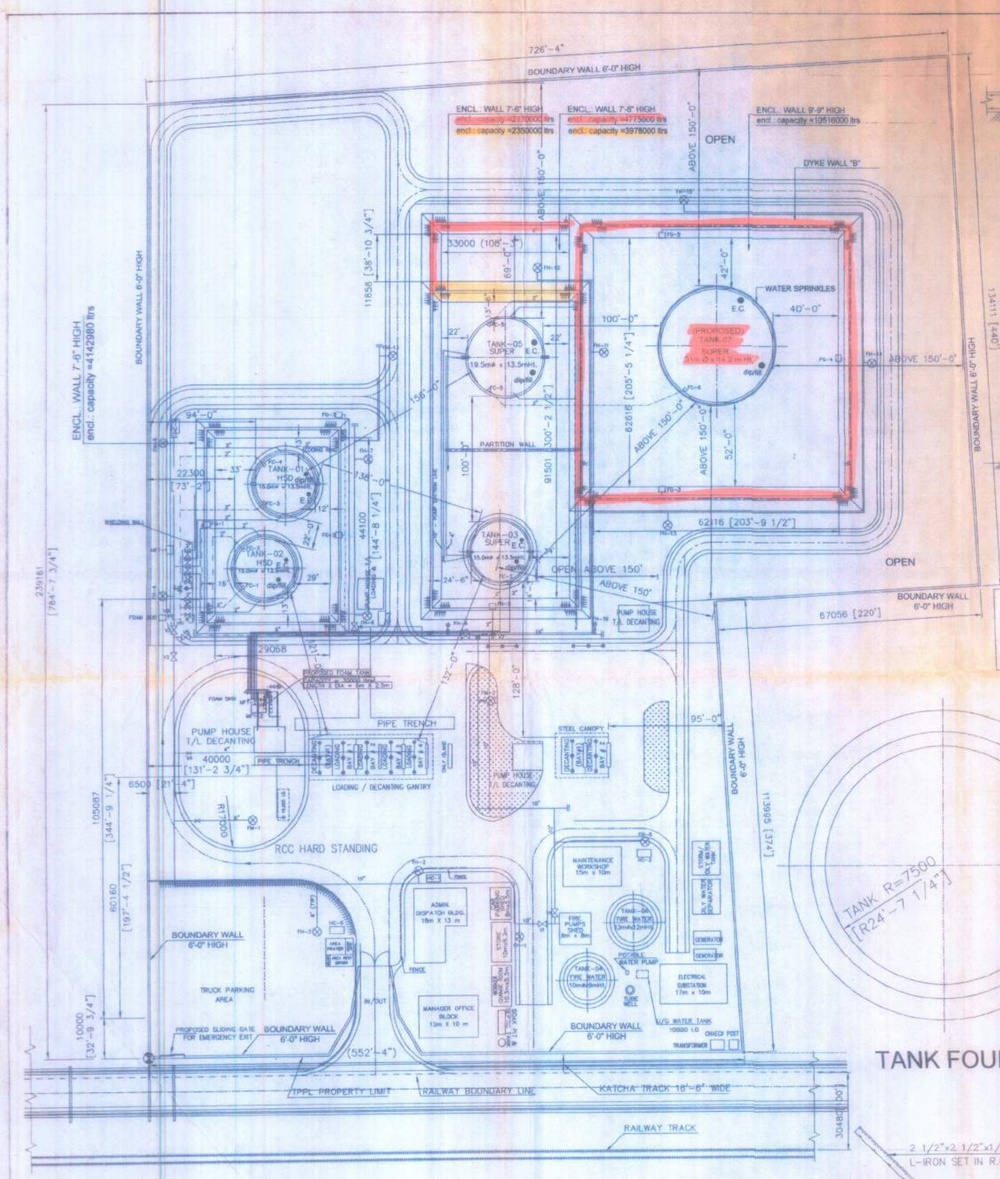

PARCO Gunvor Limited Machike Terminal (T-2)
31°43'56.21"N
73°52'47.27"E
Mouza Dhant Pura, District and Tehsil Sheikhupura
Legend
Acess Road
Dhant Pura
PARCO Gunvor (T-2)
Project Area
Be Energy Bulk Termina Machike
Lahore Sargodha Road
Sohail Textile
Lahore - Sargodha Rd
Dhant Pura
PARCO Terminal Machike
Dhantpura
Aerial Distance 700 meters
SHEERAZ
SHELL BULK OIL Te
Saba Power Company
Hascol Bulk Oil Terminal Machike
PARCO GunvorLimited (T-02)
Google Earth
Image © 2025 Airbus
N
1000 ft

ANNEXURE-B

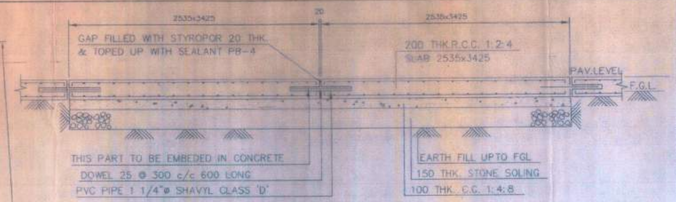
Detailed Layout Map

CHECKED & VERIFIED
AIS
RECOMMENDED FOR APPROVAL
INSPECTOR OF EXPLOSIVES
RAWALPINDI. Dated 26/8/16

FOR EXPLOSIVES APPROVAL:-
Plan Approval No. LHD-126/16
Chief Inspector of Explosives in Pakistan
Dated 29-09-2016

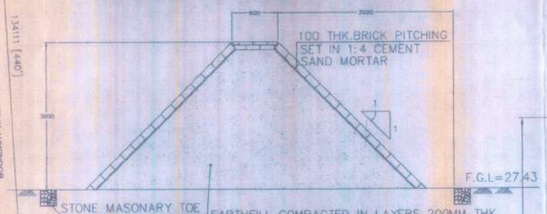


TANK FOUNDATION PLAN

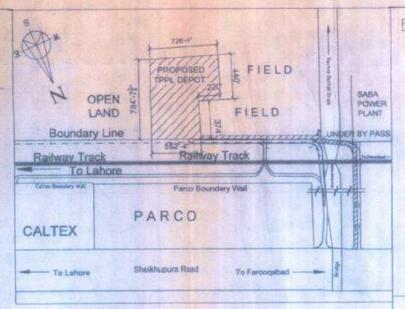


SECTION 1-1

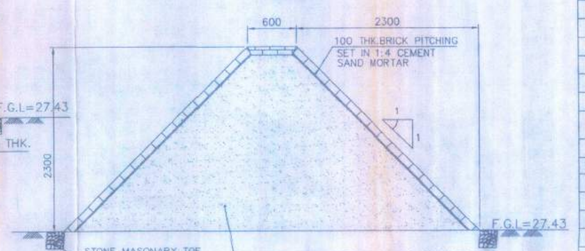
TYP. SECTION OF LOADING / DECANTING AREA



TYPICAL CROSS-SECTION OF TANK DYKE "B"



LOCATION PLAN



TYPICAL CROSS-SECTION OF TANK DYKE "A"

STORAGE TANKS					
S NO.	TANK NO.	PRODUCT	SIZE DxH meter	CAPACITY (CU.M)	CAPACITY (LITERS)
1	T-1	HSD	15 x 13.5	2120	2066450 LITERS
2	T-2	HSD	15 x 13.5	2120	2066450 LITERS
3	T-3	SUPER(DP)	15 X 13.5	2068	1963128 LITERS
4	T-4	FIRE WATER TANK	10 x 9	590	590000 LITERS
5	T-5	SUPER(DP)	19.5 X 13.5	4031	3829450 LITERS
6	T-6	FIRE WATER TANK	13 x 12	1600	1600000 LITERS
7	T-7	SUPER (DP)	21 x 14.2	4935 (5% LESS)	4750000 LITERS (5% LESS)

SCHEDULE OF AREA	
1	PLOT AREA 12.00 ACRE = 522720 SFT
2	DYKE AREA EXISTING = 8136 m^2= 87530 $Ft.^2$
3	DYKE HIGHT = 2.3 m = 7.55 Ft.
4	DYKE NET CAPACITY = 18713 m^3= 660329 $Ft.^3$
5	PROPOSED DYKE AREA = 4761 m^2= 51221 $Ft.^2$
6	DYKE HIGHT = 3 m = 9.84 Ft.
7	DYKE NET CAPACITY = 14283 m^3= 504012 $Ft.^3$

LEGENDS & SYMBOLS

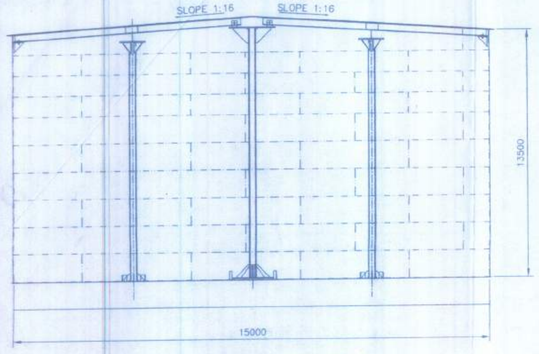
———	FW LINE
- - - - -	FOAM LINE
—·—·—	CHAIN LINK FENCE
———	BOUNDARY WALL
FG	FOAM GENERATOR (EQUIPMENT INSTALLED ON DYKE WALL)
FC	FOAM CHAMBER (EQUIPMENT INSTALLED ON DYKE WALL)
MFT	MOBILE FOAM TROLLEY
HC	HOSE CABINET
FH⊗	FIRE HYDRANT
FM⊗	FIRE FOAM MONITOR
V ⋈	VALVE

NOTES:

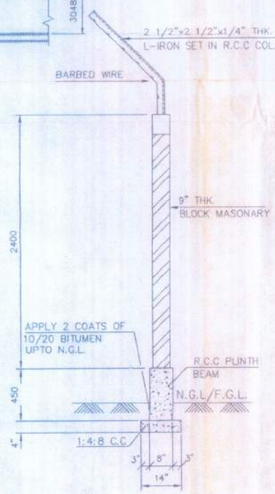
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED.
2. FIRE WATER PIPES SHALL BE OF WELDED OR SCREWED CARBON STEEL TO API STANDARDS 5L.
3. FLANGES SHALL BE OF CARBON STEEL CONFIRMING TO ASME B 16.5 WITH PRESSURE RATING OF 150#
4. CARBON STEEL FLANGED GATE VALVES SHALL BE OF SOLID WEDGE TYPE WITH RISING STEM CONFIRMING TO ASME B 16.34 WITH PRESSURE RATING OF 150#
5. FIRE HYDRANTS SHALL BE OF CARBON STEEL WITH DIA. 150 FLANGED INLET & 4 Nos. DIA. 65 INSTANTANEOUS COUPLING OUTLETS. PLUG AND CHAIN THEY SHALL BE RATED FOR 150# WORKING PRESSURE.
6. FOAM COMPOUND TANK TROLLEY SHALL BE WELDED STEEL PRESSURE VESSEL TESTED TO 25 BARS WITH INTERNAL CORROSION RESISTANT LINNING AND EXTERNAL CORROSION RESISTANT PAINT FITTED WITH WHEEL AND HANDLE.
7. HOSE PIPES SHALL BE OF LINEN WITH INTERNAL RUBBER LINNING THEY SHALL BE RATED FOR A WORKING PRESSURE OF 25 BARS AND SHALL HAVE BRASS INSTANTANEOUS COUPLING ENDS.
8. ALL TANKS HAVE BEEN DESIGNED AS PER API-650.
9. ALL PIPING IS IN ACCORDANCE WITH ANSI B31.3
10. ALL STORAGE TANKS ARE STEEL FABRICATED, WELDED, AND HYDRO TESTED. TANKS ARE VERTICALLY INSTALLED OVER A MADE UP FOUNDATION MIN 450MM HIGH ABOVE GROUND. ALL TANKS ARE PROVIDED WITH DIP & FILL PIPES OF BURIED TANKS ARE EXTENDED DOWN TO THEIR BOTTOMS AND VENT PIPES ARE KEPT 4 METERS ABOVE GROUND LEVEL AND FITTED WITH HOODS & 231 MESH WIRE GAUGE. EACH BUILDING IS PROVIDED WITH ADEQUATE VENTILATION AT PLINTH & EAVES LEVELS.
11. TWO Nos. INDEPENDENT EARTHING CONNECTIONS PROVIDED FOR EACH TANK.
12. REQUIREMENTS OF CIVIL DEFENCE, CHIEF INSPECTOR OF EXPLOSIVE, MINISTRY OF DEFENCE AND HIGHWAY DEPARTMENT HAVE BEEN TAKEN INTO CONSIDERATION FOR THIS LAYOUT.

IT IS CERTIFIED THAT NO NATURAL GAS PIPE IS EXISTING WITHIN A RADIUS OF 16.25 M (OR 50 FEET) OF THE REFINERY AND ADEQUATE FIRE FIGHTING EQUIPMENT ARE KEPT IN THE REFINERY AT ALL TIMES AND ALL THE ELECTRICAL APPLIANCES WITHIN THE REFINERY CONFIRM TO BSS 289.

FOR TOTAL PARCO PAKISTAN LTD.
CHIEF ENGINEER

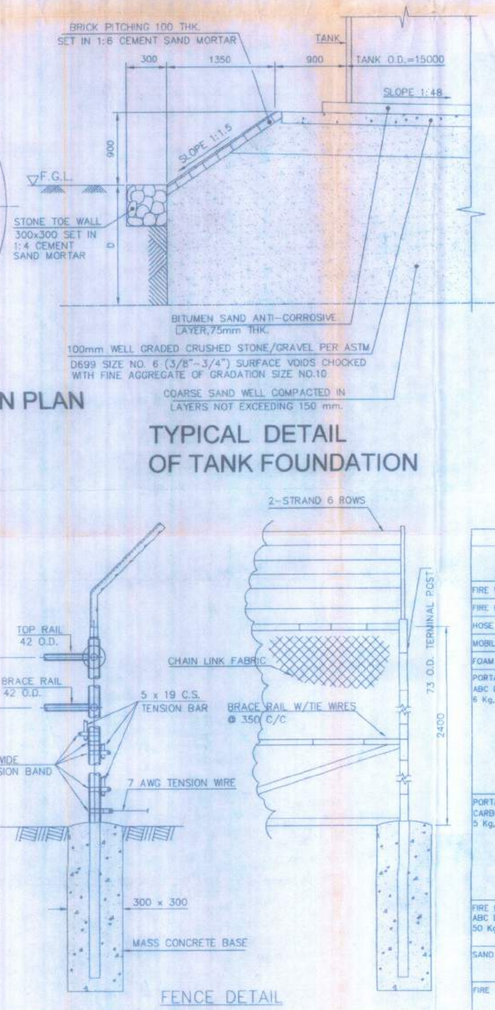


TYP. SECTION OF STORAGE TANK

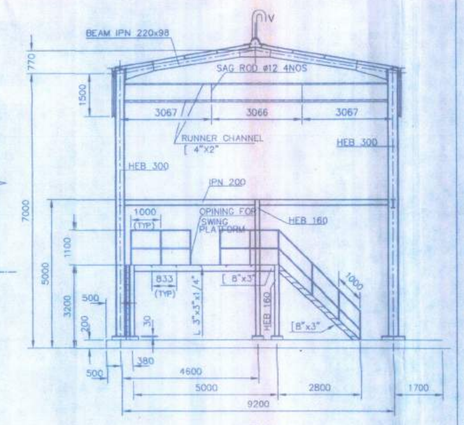


TYP. SECTION OF BOUNDARY WALL

FENCE DETAIL



TYPICAL DETAIL OF TANK FOUNDATION



VIEW-X

LIST OF FIRE FIGHTING EQUIPMENT		
EQUIPMENT	QUANTITY (Nos.)	LOCATION
FIRE WATER MONITORS	2	LOADING / DECANTING GANTRY PARKING AREA
FIRE HYDRANTS	8	ADMINISTRATOR BUILDING,PARKING AREA, STORE, TANK-01,TANK-02 MAINTENANCE WORKSHOP
HOSE CABINETS	5	ADMINISTRATOR BUILDING,MAINTENANCE WORKSHOP, LOADING PUMP HOUSE,TANK-01,GATE HOUSE
MOBILE FOAM TROLLEYS	2	TANK-01, TANK-02, LOADING / DECANTING GANTRY
FOAM SKID	1	TANK-01,TANK-02
PORTABLE FIRE EXTINGUISHERS, ABC DRY CHEMICAL 6 Kg, NIPPON PAN-20 SD.	14	3 Nos. WARE HOUSE / STORE ROOM
		1 No. GENERATOR & SWITCH ROOM
		1 No. TRANSFORMER ROOM
		2 Nos. OFFICE BUILDING
		1 Nos. WORK-SHOP
		1 No. GATE HOUSE
		5 Nos. GANTRY
PORTABLE FIRE EXTINGUISHERS, CARBON DIOXIDE 5 Kg, NIPPON NC-7	11	2 Nos. GENERATOR & SWITCH ROOM
		2 Nos. TRANSFORMER ROOM
		3 Nos. WORKSHOP
		1 No. OFFICE BUILDING
		1 No. GATE HOUSE
		2 Nos. WORKER CHANGE ROOM
FIRE EXTINGUISHERS, ABC DRY CHEMICAL 90 Kg, (TROLLEY MOUNTED)	2	2 Nos. GANTRY
SAND BUCKETS	6	3 Nos. PUMP HOUSE
		3 Nos. LOADING GANTRY
FIRE BLANKETS	2	1 Nos. LOADING GANTRY
		1 Nos. KITCHEN (OFFICE BUILDING)

REV.	DATE	DESCRIPTION OF REVISION	DRAWN	CHECKED	APPR.
9	09-11-2015	ADD DP TANK	QA	MJS	MJS
8	08-11-2013	REMOVED HSD TANK	QA	MJS	MJS
7	27-8-2012	ADD HSD & FIRE WATER TANK	QA	MJS	MJS
6	28-7-2011	DP STORAGE TANK RELOCATED	QA	ZH	ZH
5	03-5-2011	DP STORAGE TANK RELOCATED	QA	ZH	ZH
4	05-11-2010	ADD DP STORAGE TANK	QA	ZH	ZH
3	20-04-2010	ADD LOADING BAYS	QA	AH	AH
2	07-07-2008	REVISED AS PER EXPLOSIVES DEPTT. COMMENTS	MSL	SF	SFA
1	07-02-2007	REVISED AS PER TPPL COMMENTS	MSL	SF	SFA
0	03-02-2007	FIRST ISSUE	SMU	SF	SFA

TOTAL PARCO Pakistan Ltd

131-2 JOB NO.

PROJECT:
PROPOSED PLAN OF TPPL,s BULK OIL STORAGE DEPOT
AT: KHAWAT Nos. 58,81 KHATOONI Nos. 188 TO 200/1, 269 SQUARE No. 19. KILA Nos. 8,7,14,15/1,15/2,16,17,18,23,24,25. SQUARE No. 20 KILA Nos.10,11,20,21 LAND MEASURING 99 KANALS 04-MARLAS IN THE NAME OF TOTAL PARCO PAKISTAN. MOUZA DHANT PURA, TEHSIL & DISTRICT SHEIKHUPURA

DWG. NO. EX-TPP-DPS-01

SIZE	SCALE	SHEET
A1	1:1000	1 OF 1

ANNEXURE-C

Monitoring Reports

Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 25A/ 003917

Monitoring & Test Report

- Drinking Water
- Waste Water
- Ambient Air
- Stack Emissions
- LUX Monitoring
- Noise Level Monitoring

TOTAL PARCO PAKISTAN (Terminal 2)

12th Feb. 2025

Job Reference No.: GCEC-PK-PU-37/2025

Pakistan Office: House No. 368-B , Block Canal View
Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Client Detail:	
Name of Contact Person:	Mr. Badar Siddiqui
Designation:	Terminal Manager Machike
Contact Number:	+92-321-5373379
Email:	Badar.siddiqui@totalparco.com.pk
Address:	Machike Oil Terminal-2, 9 km Sargodha Road Sheikhupura.

GCEC Details:	
Director:	Mr. Mian Khurram Usman
Telephone:	+92 42 35962885
Fax:	+92 42 35962884
Email:	manager.operations@gcee.ae
Address	House No. 368-B Block B, Canal View, Lahore

Signatories:

Green Crescent Environmental Consultants Pvt. Ltd. PAKISTAN

Pakistan Office: House No. 368-B , Block Canal View Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 25A/ 003919

CHEMICAL ANALYSIS TEST REPORT (DRINKING WATER)

Sample Details			
Job Ref. No:	GCEC-PK-PU-37/2025	Client Name:	Total Parco Pakistan (T2)
Telephone No.	+92-321-5373379	Sample Matrix:	Drinking Water Sample
Sample Date:	07-02-2025	Sampled By:	GCEC
Sample Receipt Date:	08-02-2025	Date of Completion of Analysis:	12-02-2025
Grab/Composite:	Grab Sampling	Address: Machike Oil Terminal-2, 9 km Sargodha Road Sheikhupura.	

Sample Identification	
01	Electric Cooler

Parameters	Analysis Method	Unit	LOR	Result 01	PEQS
PHYSICAL & CHEMICAL ANALYSIS					
pH**	APHA-4500H+ B	-	0.01	7.84	6.5-8.5
Odor	In-house	-	-	Odorless	Non-Objectionable
Taste	In-house	-	-	Sweet	Non-Objectionable
Color	APHA-2120 B/C	Pt/Co	1.0	<1.0	≤15 TCU
Turbidity**	APHA-2130 B	NTU	-	ND	<5 NTU
Total Hardness**	APHA-2340 C	mg/l	0.1	40.0	< 500 mg/l
Total Dissolved Solid (TDS)**	APHA-2540 C	mg/l	1.0	312.0	< 1000
Ammonia	APHA-4500-NH_3-B	mg/l	0.002	<0.002	-
Chloride **	APHA-4500Cl- B	mg/l	0.24	21.68	< 250
Cyanide (CN)	APHA-4500CN E	mg/l	0.01	<0.01	≤ 0.05
Fluoride (F)**	APHA-4500F- C	mg/l	0.01	<0.01	≤ 1.5
Nitrite	APHA-4500NO2 B	mg/l	0.01	<0.01	≤ 3 (P)
Nitrate**	APHA-4500NO3 B	mg/l	0.1	0.1	≤ 50
Phenolic Compound	APHA-5530 D	mg/l	0.01	<0.01	-
Residual Chlorine	APHA-4500Cl G	mg/l	0.1	<0.1	0.2-0.5
Aluminum (Al)	APHA-3111Al B	mg/l	0.028	<0.028	≤ 0.2
Cadmium**	APHA-3111Cd B	mg/l	0.0028	<0.0028	0.01
Copper**	APHA-3111Cu B	mg/l	0.0045	<0.0045	2
Chromium**	APHA-3111Cr B	mg/l	0.0054	<0.0054	≤ 0.05 (P)
Mercury	APHA-3112Hg B	mg/l	0.0008	<0.0008	≤ 0.001
Antimony (Sb)**	APHA-3111Sb B	mg/l	-	ND	≤ 0.005 (P)
Nickel**	APHA-3111Ni B	mg/l	0.008	<0.008	≤ 0.02
Zinc**	APHA-3111Zn B	mg/l	0.0033	0.0064	5.0
Arsenic	APHA-3111As B	mg/l	0.01	<0.01	≤ 0.05 (P)
Barium	APHA-3111Ba B	mg/l	0.031	<0.031	0.7
Manganese**	APHA-3111Mn B	mg/l	0.0016	<0.0016	≤ 0.5
Iron**	APHA-3111Fe B	mg/l	0.1	0.1544	-
Boron	APHA-4500-B (C)	mg/l	0.1	<0.1	0.3
Lead**	APHA-3111Pb B	mg/l	0.013	<0.013	≤ 0.05
Selenium	APHA-3111Se B	mg/l	-	ND	0.01 (P)
MICROBIOLOGICAL ANALYSIS					
Total Coliforms	APHA:9222 B	CFU/100ml		Absent	0/100ml
Faecal Coliforms (Ecoli)	APHA:9222 D	CFU/100ml		Absent	0/100ml

Abbreviations:
ND: Not Detected **LOR:** Limit of Reporting **PEQS:** Punjab Environmental Quality Standards

Note:
** Uncertainty of all the parameters and laboratory conditions at the time of analysis will be provided as per client's requirement. The lab environmental conditions are maintained at 25±5C° and humidity at 50±20%.*

*Disclaimer: The results are solely of the samples provided.**All the stated Parameters are PNAC accredited.*

Sample Analyzed By:

Analyst
Mr. Idrees Zaman

Name of Chief Analyst with Seal:

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Sr. No# 25A/ 003920

CHEMICAL ANALYSIS TEST REPORT (DRINKING WATER)

Sample Details			
Job Ref. No:	GCEC-PK-PU-37/2025	Client Name:	Total Parco Pakistan (T2)
Telephone No.	+92-321-5373379	Sample Matrix:	Drinking Water Sample
Sample Date:	07-02-2025	Sampled By:	GCEC
Sample Receipt Date:	08-02-2025	Date of Completion of Analysis:	12-02-2025
Grab/Composite:	Grab Sampling	Address: Machike Oil Terminal-2, 9 km Sargodha Road Sheikhupura.	

Sample Identification	
02	Office Mess

Parameters	Analysis Method	Unit	LOR	Result 02	PEQS
PHYSICAL & CHEMICAL ANALYSIS					
pH**	APHA-4500H+ B	-	0.01	7.33	6.5-8.5
Odor	In-house	-	-	Odorless	Non-Objectionable
Taste	In-house	-	-	Sweet	Non-Objectionable
Color	APHA-2120 B/C	Pt/Co	1.0	<1.0	≤15 TCU
Turbidity**	APHA-2130 B	NTU	-	ND	<5 NTU
Total Hardness**	APHA-2340 C	mg/l	0.1	144.0	< 500 mg/l
Total Dissolved Solid (TDS)**	APHA-2540 C	mg/l	1.0	258.0	< 1000
Ammonia	APHA-4500-NH_3-B	mg/l	0.002	<0.002	-
Chloride **	APHA-4500Cl- B	mg/l	0.24	74.89	< 250
Cyanide (CN)	APHA-4500CN E	mg/l	0.01	<0.01	≤ 0.05
Fluoride (F)**	APHA-4500F- C	mg/l	0.01	<0.01	≤ 1.5
Nitrite	APHA-4500NO2 B	mg/l	0.01	<0.01	≤ 3 (P)
Nitrate**	APHA-4500NO3 B	mg/l	0.1	0.1	≤ 50
Phenolic Compound	APHA-5530 D	mg/l	0.01	<0.01	-
Residual Chlorine	APHA-4500Cl G	mg/l	0.1	<0.1	0.2-0.5
Aluminum (Al)	APHA-3111Al B	mg/l	0.028	<0.028	≤ 0.2
Cadmium**	APHA-3111Cd B	mg/l	0.0028	<0.0028	0.01
Copper**	APHA-3111Cu B	mg/l	0.0045	<0.0045	2
Chromium**	APHA-3111Cr B	mg/l	0.0054	<0.0054	≤ 0.05 (P)
Mercury	APHA-3112Hg B	mg/l	0.0008	<0.0008	≤ 0.001
Antimony (Sb)**	APHA-3111Sb B	mg/l	-	ND	≤ 0.005 (P)
Nickel**	APHA-3111Ni B	mg/l	0.008	<0.008	≤ 0.02
Zinc**	APHA-3111Zn B	mg/l	0.0033	0.0138	5.0
Arsenic	APHA-3111As B	mg/l	0.01	<0.01	≤ 0.05 (P)
Barium	APHA-3111Ba B	mg/l	0.031	<0.031	0.7
Manganese**	APHA-3111Mn B	mg/l	0.0016	<0.0016	≤ 0.5
Iron**	APHA-3111Fe B	mg/l	0.1	0.1615	-
Boron	APHA-4500-B (C)	mg/l	0.1	<0.1	0.3
Lead**	APHA-3111Pb B	mg/l	0.013	<0.013	≤ 0.05
Selenium	APHA-3111Se B	mg/l	-	ND	0.01 (P)
MICROBIOLOGICAL ANALYSIS					
Total Coliforms	APHA:9222 B	CFU/100ml		Absent	0/100ml
Faecal Coliforms (Ecoli)	APHA:9222 D	CFU/100ml		Absent	0/100ml

Abbreviations:
ND: Not Detected **LOR:** Limit of Reporting **PEQS:** Punjab Environmental Quality Standards

Note:
** Uncertainty of all the parameters and laboratory conditions at the time of analysis will be provided as per client's requirement. The lab environmental conditions are maintained at 25±5C° and humidity at 50±20%.*
*Disclaimer: The results are solely of the samples provided.**All the stared Parameters are PNAC accredited.*

Sample Analyzed By:

Analyst
Mr. Idrees Zaman

Name of Chief Analyst with Seal:

Mr. Qamar Raza Jaffri

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CHEMICAL ANALYSIS TEST REPORT (WASTE WATER)

Sample Details			
Job Ref. No:	GCEC-PK-PU-37/2025	Client Name:	Total Parco Pakistan (T2)
Telephone No.	+92-321-5373379	Sample Matrix:	Waste Water Sample
Sample Date:	07-02-2025	Sampled By:	GCEC
Sample Receipt Date:	08-02-2025	Date of Completion of Analysis:	12-02-2025
Grab/Composite:	Grab Sampling	Address:	Machike Oil Terminal-2, 9 km Sargodha Road Sheikhupura.

Sample Identification	
01	Rain Water

Parameters	Analysis Method	Unit	LOR	Result 01	PEQS
PHYSICAL & CHEMICAL ANALYSIS					
Temperature	-	°C	-	21.9	-
pH**	APHA-4500H+ B	pH unit	0.01	8.04	6-9
Total Dissolved Solid (TDS)**	APHA-2540 C	mg/l	1.0	312.0	3500
Pesticides	APHA-6630 B	mg/l	-	ND	0.15
Oil and Grease**	USEPA-1664	mg/l	0.2	<0.2	10
Biological Oxygen Demand	APHA-5210 B	mg/l	1.0	7.0	80
Chemical Oxygen Demand**	APHA-5220-D	mg/l	1.0	18.0	150
Total Suspended Solid**	APHA-2540-D	mg/l	1.0	68.0	200
Phenolic Compound	APHA-5530 D	mg/l	0.01	<0.01	0.1
Chloride (Cl)**	APHA-4500Cl- B	mg/l	0.24	59.13	1000
Fluoride (F)**	APHA-4500F- C	mg/l	0.01	<0.01	10
Cyanide (CN)	APHA-4500CN E	mg/l	0.01	<0.01	1.0
Detergent	APHA-5540 B	mg/l	-	ND	20
Sulphate**	APHA-4500-SO_4C	mg/l	0.41	46.92	600
Sulphide	APHA-4500-S_2-E	mg/l	0.4	<0.4	1.0
Ammonia	APHA-4500-NH_3-B	mg/l	0.002	<0.002	40
Silver	APHA-3500Ag-B	mg/l	0.0032	<0.0032	1.0
Cadmium**	APHA-3500Cd B	mg/l	0.0028	<0.0028	0.1
Chromium**	APHA-3500Cr B	mg/l	0.0054	<0.0054	1.0
Copper **	APHA-3500Cu B	mg/l	0.0045	<0.0045	1.0
Lead**	APHA-3500-Pb B	mg/l	0.013	0.0157	0.5
Mercury	APHA-3500-Hg B	mg/l	0.0008	<0.0008	0.01
Nickel**	APHA-3500-Ni B	mg/l	0.008	<0.008	1.0
Zinc**	APHA-3500-Zn B	mg/l	0.0033	0.1263	5.0
Arsenic	APHA-3500As B	mg/l	0.01	<0.01	1.0
Barium	APHA-3500Ba B	mg/l	0.031	<0.031	1.5
Manganese**	APHA-3500-Mn B	mg/l	0.0016	0.4140	1.5
Iron**	APHA-3500-Fe-B	mg/l	0.1	5.3141	8.0
Boron	APHA-4500B-C	mg/l	0.1	<0.1	6.0
Total Chlorine	APHA-4500Cl-B	mg/l	0.1	<0.1	1.0
Selenium	APHA-3500Se C	mg/l	-	ND	0.5
Total Toxic Metals	-	mg/l	-	0.0157	2.0

Abbreviations:
ND: Not Detected **LOR:** Limit of Reporting **PEQS:** Punjab Environmental Quality Standards

Note:
**Uncertainty of all the parameters and laboratory conditions at the time of analysis will be provided as per client's requirement. The lab environmental conditions are maintained at 25±5C° and humidity at 50±20%.*

*Disclaimer: The results are solely of the sample provided. **All the starred parameters are PNAC accredited.*

Sample Analyzed By:

Analyst
Mr. Idrees Zaman

Name of Chief Analyst with Seal:

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Sr. No# 25A/ 003922

CHEMICAL ANALYSIS TEST REPORT (WASTE WATER)

Sample Details			
Job Ref. No:	GCEC-PK-PU-37/2025	Client Name:	Total Parco Pakistan (T2)
Telephone No.	+92-321-5373379	Sample Matrix:	Waste Water Sample
Sample Date:	07-02-2025	Sampled By:	GCEC
Sample Receipt Date:	08-02-2025	Date of Completion of Analysis:	12-02-2025
Grab/Composite:	Grab Sampling	Address: Machike Oil Terminal-2, 9 km Sargodha Road Sheikhupura.	

Sample Identification

02 Process Water

Parameters	Analysis Method	Unit	LOR	Result 02	PEQS
PHYSICAL & CHEMICAL ANALYSIS					
Temperature	-	°C	-	21.9	-
pH**	APHA-4500H+ B	pH unit	0.01	7.98	6-9
Total Dissolved Solid (TDS)**	APHA-2540 C	mg/l	1.0	318.0	3500
Pesticides	APHA-6630 B	mg/l	-	ND	0.15
Oil and Grease**	USEPA-1664	mg/l	0.2	<0.2	10
Biological Oxygen Demand	APHA-5210 B	mg/l	1.0	14.0	80
Chemical Oxygen Demand**	APHA-5220-D	mg/l	1.0	36.0	150
Total Suspended Solid**	APHA-2540-D	mg/l	1.0	121.0	200
Phenolic Compound	APHA-5530 D	mg/l	0.01	<0.01	0.1
Chloride (Cl)**	APHA-4500Cl- B	mg/l	0.24	49.27	1000
Fluoride (F)**	APHA-4500F- C	mg/l	0.01	<0.01	10
Cyanide (CN)	APHA-4500CN- E	mg/l	0.01	<0.01	1.0
Detergent	APHA-5540 B	mg/l	-	ND	20
Sulphate**	APHA-4500-SO_4C	mg/l	0.41	56.80	600
Sulphide	APHA-4500-S_2-E	mg/l	0.4	<0.4	1.0
Ammonia	APHA-4500-NH_3-B	mg/l	0.002	<0.002	40
Silver	APHA-3500Ag-B	mg/l	0.0032	<0.0032	1.0
Cadmium**	APHA-3500Cd B	mg/l	0.0028	<0.0028	0.1
Chromium**	APHA-3500Cr B	mg/l	0.0054	<0.0054	1.0
Copper **	APHA-3500Cu B	mg/l	0.0045	0.0897	1.0
Lead**	APHA-3500-Pb B	mg/l	0.013	<0.013	0.5
Mercury	APHA-3500-Hg B	mg/l	0.0008	<0.0008	0.01
Nickel**	APHA-3500-Ni B	mg/l	0.008	<0.008	1.0
Zinc**	APHA-3500-Zn B	mg/l	0.0033	0.6959	5.0
Arsenic	APHA-3500As B	mg/l	0.01	<0.01	1.0
Barium	APHA-3500Ba B	mg/l	0.031	<0.031	1.5
Manganese**	APHA-3500-Mn B	mg/l	0.0016	0.4689	1.5
Iron**	APHA-3500-Fe-B	mg/l	0.1	6.8167	8.0
Boron	APHA-4500B-C	mg/l	0.1	<0.1	6.0
Total Chlorine	APHA-4500Cl-B	mg/l	0.1	<0.1	1.0
Selenium	APHA-3500Se C	mg/l	-	ND	0.5
Total Toxic Metals	-	mg/l	-	0.0897	2.0

Abbreviations:
ND: Not Detected LOR: Limit of Repoeting PEQS: Punjab Environmental Quality Standards

Note:
Uncertainty of all the parameters and laboratory conditions at the time of analysis will be provided as per client's requirement. The lab environmental conditions are maintained at 25±5C° and humidity at 50±20%.

*Disclaimer: The results are solely of the sample provided. **All the starred parameters are PNAC accredited.*

Sample Analyzed By:

Analyst
Mr. Idrees Zaman

Name of Chief Analyst with Seal:

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Ambient Air Monitoring Location # 1

NEAR GENERATOR AREA

TOTAL PARCO PAKISTAN (Terminal 2)

(Sheikhupura)

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Ambient Air Quality Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Generator Area
Date of Intervention	07-Feb-2025

Parameter	Unit	Monitoring Duration	LDL	Average Obtained Concentration	PEQS*
Nitrogen Dioxide (NO_2)	µg/m³	01 Hour	1.00	40.10	80.0
Nitrogen Oxide (NO)	µg/m³	01 Hour	1.00	28.45	40.0
NO_x	µg/m³	01 Hour	1.00	68.55	120.0
Sulphur Dioxide (SO_2)	µg/m³	01 Hour	1.00	26.80	120.0
Carbon Monoxide (CO)	mg/m³	01 Hour	0.01	2.0	10.0
Ozone (O_3)	µg/m³	01 Hour	-	22.30	130.0
Particulate Matter ($PM_{2.5}$)	µg/m³	01 Hour	1.00	15.65	15.0
Particulate Matter (PM_{10})	µg/m³	01 Hour	1.00	120.4	150.0
Suspended Particulate Matter (SPM)	µg/m³	01 Hour	1.00	171.05	500.0

Abbreviations:
µg/m³= Micrograms per Cubic Meter
mg/m³= Milligrams per Cubic Meter
(* 24 Hours Standard For All Parameters Except CO, O_3 & $PM_{2.5}$)
LDL= Lowest Detection Limit
PEQS= Punjab Environmental Quality Standards

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Monitoring Performed By:
Deputy Analyst
Abdul Aleem

Name of Chief Analyst with Seal:
Mr. Uzma Raza Jaswal

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Noise Level Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Generator Area
Date of Intervention	07-Feb-2025

Sr. No.	Method/Technique	Unit	Obtained Concentration
	Day Time		
1.	Sound Level Meter	dB	66.05

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Monitoring Performed By:

Deputy Analyst

Abdul Aleem

Name of Chief Analyst with Seal:

Mr. Usman Raza Jaspal

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Ambient Air Monitoring Location # 2

NEAR TANK PARKING AREA

TOTAL PARCO PAKISTAN (Terminal 2)

(Sheikhupura)

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Ambient Air Quality Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Tank Parking Area
Date of Intervention	07-Feb-2025

Patameter	Unit	Monitoring Duration	LDL	Average Obtained Concentration	PEQS*
Nitrogen Dioxide (NO_2)	µg/m³	01 Hour	1.00	44.85	80.0
Nitrogen Oxide (NO)	µg/m³	01 Hour	1.00	30.40	40.0
NO_X	µg/m³	01 Hour	1.00	75.25	120.0
Sulphur Dioxide (SO_2)	µg/m³	01 Hour	1.00	37.65	120.0
Carbon Monoxide (CO)	mg/m³	01 Hour	0.01	2.2	10.0
Ozone (O_3)	µg/m³	01 Hour	-	29.80	130.0
Particulate Matter ($PM_{2.5}$)	µg/m³	01 Hour	1.00	17.30	15.0
Particulate Matter (PM_{10})	µg/m³	01 Hour	1.00	121.65	150.0
Suspended Particulate Matter (SPM)	µg/m³	01 Hour	1.00	138.95	500.0

Abbreviations:
µg/m³= Micrograms per Cubic Meter
mg/m³= Milligrams per Cubic Meter
(* 24 Hours Standard For All Parameters Except CO, O_3 & $PM_{2.5}$)
LDL= Lowest Detection Limit
PEQS= Punjab Environmental Quality Standards

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Monitoring Performed By:
Deputy Analyst
Abdul Aleem

Name of Chief Analyst with Seal:
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Noise Level Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Tank Parking Area
Date of Intervention	07-Feb-2025

Sr. No.	Method/Technique	Unit	Obtained Concentration
	Day Time		
1.	Sound Level Meter	dB	60.9

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Monitoring Performed By:
Deputy Analyst
Abdul Aleem

Name of Chief Analyst with Seal:
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Ambient Air Monitoring Location # 3

NEAR RECEIPT GANTRY AREA

TOTAL PARCO PAKISTAN (Terminal 2)

(Sheikhupura)

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Ambient Air Quality Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Receipt Gantry Area
Date of Intervention	07-Feb-2025

Parameter	Unit	Monitoring Duration	LDL	Average Obtained Concentration	PEQS*
Nitrogen Dioxide (NO_2)	µg/m³	01 Hour	1.00	37.95	80.0
Nitrogen Oxide (NO)	µg/m³	01 Hour	1.00	25.40	40.0
NO_x	µg/m³	01 Hour	1.00	63.35	120.0
Sulphur Dioxide (SO_2)	µg/m³	01 Hour	1.00	22.90	120.0
Carbon Monoxide (CO)	mg/m³	01 Hour	0.01	1.80	10.0
Ozone (O_3)	µg/m³	01 Hour	-	26.15	130.0
Particulate Matter ($PM_{2.5}$)	µg/m³	01 Hour	1.00	13.80	15.0
Particulate Matter (PM_{10})	µg/m³	01 Hour	1.00	112.15	150.0
Suspended Particulate Matter (SPM)	µg/m³	01 Hour	1.00	160.95	500.0

Abbreviations:
µg/m³= Micrograms per Cubic Meter
mg/m³= Milligrams per Cubic Meter
(* 24 Hours Standard For All Parameters Except CO, O_3 & $PM_{2.5}$)
LDL= Lowest Detection Limit
PEQS= Punjab Environmental Quality Standards

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Monitoring Performed By:
Deputy Analyst
Abdul Aleem

Name of Chief Analyst with Seal:
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Noise Level Monitoring

Job Reference Number	GCEC-PK-PU-37/2025
Monitoring Point	Near Receipt Gantry Area
Date of Intervention	07-Feb-2025

Sr. No.	Method/Technique	Unit	Obtained Concentration
Day Time			
1.	Sound Level Meter	dB	55.6

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Monitoring Performed By:
Deputy Analyst
Abdul Aleem

Name of Chief Analyst with Seal:

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Green Crescent
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Sr. No# 25A/ 003932

Stack Emission Monitoring Report

Client Name:	Total Parco Pakistan (T2)	Reporting Date:	12-Feb-2025
Job Number:	GCEC-PK-PU-37/2025		

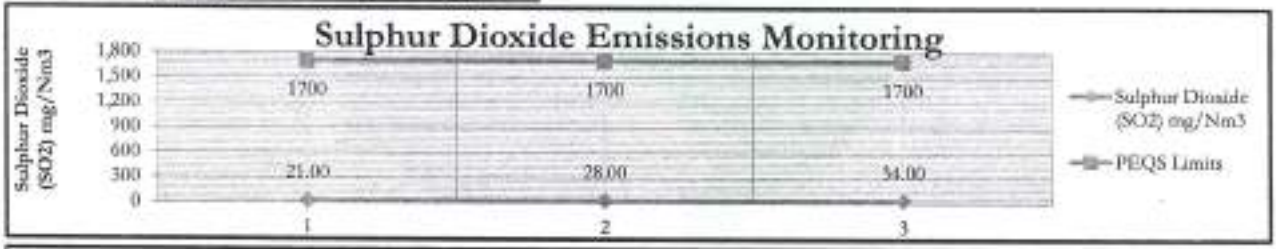
Monitoring Point Details & Monitoring Results

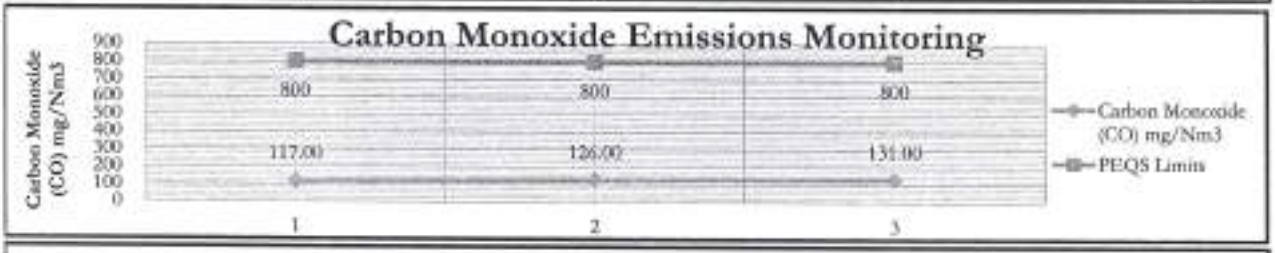
Monitoring Point:	Generator-2	Monitoring Time:	14:07
Load:	On Load	Monitoring Date:	7-Feb-2025
Fuel Type:	Diesel	Instrument Used:	Lancom-IV
Monitoring Location:	Sheikhupura	Capacity:	250KV

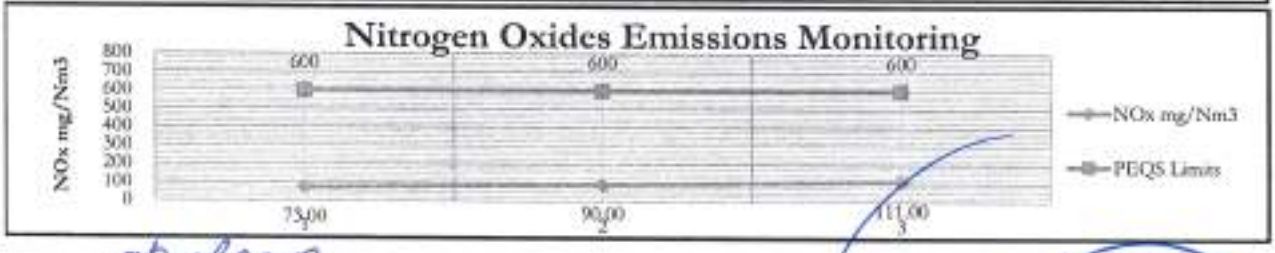
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	4.60	5.20	5.90	-
Oxygen (O2)	%	15.90	14.70	13.90	-
Carbon Monoxide (CO)	mg/Nm^3	117.00	126.00	131.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	21.00	28.00	34.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	12.00	19.00	28.00	-
Nitrogen Oxide (NO)	mg/Nm^3	61.00	71.00	83.00	-
NOx	mg/Nm^3	73.00	90.00	111.00	600*
Particulate Matter	mg/Nm^3	89.61			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Miligram/Normal meter cube







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Stack Emission Monitoring Report

Client Name:	Total Parco Pakistan (T2)	Reporting Date:	12-Feb-2025
Job Number:	GCEC-PK-PU-37/2025		

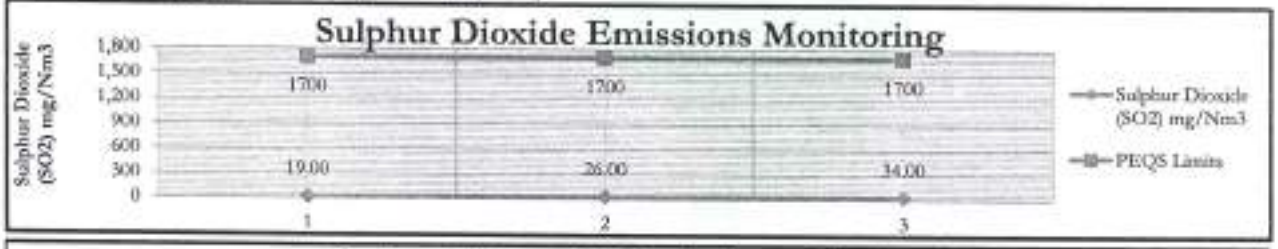
Monitoring Point Details & Monitoring Results

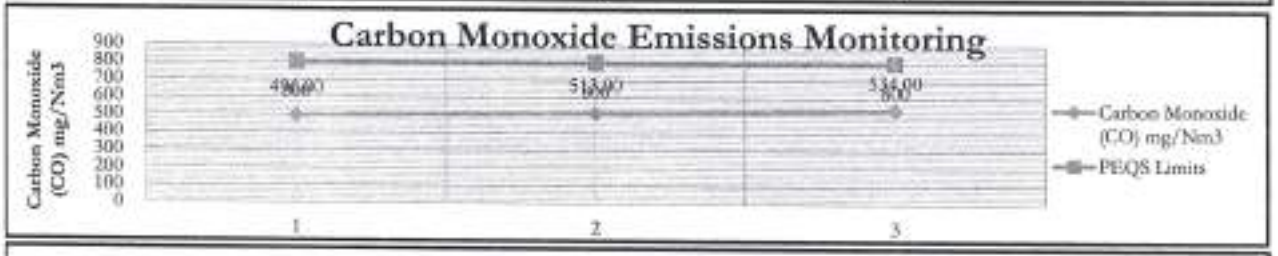
Monitoring Point:	Generator-3	Monitoring Time:	14:11
Load:	On Load	Monitoring Date:	7-Feb-2025
Fuel Type:	Diesel	Instrument Used:	Lancom-IV
Monitoring Location:	Sheikhupura	Capacity:	300KV

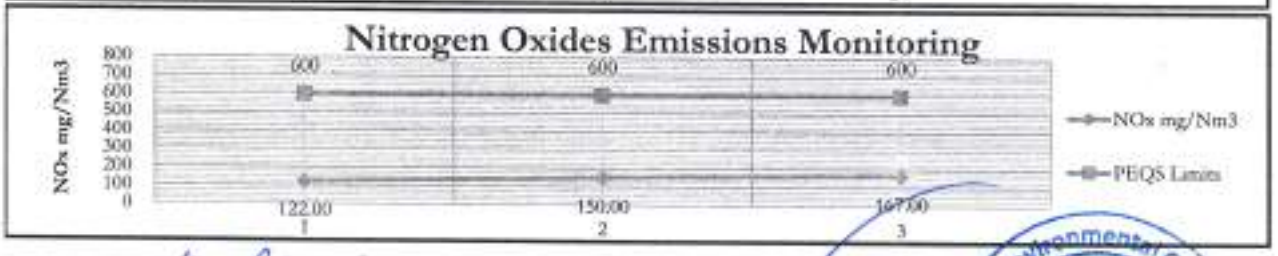
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	4.70	5.90	6.10	-
Oxygen (O2)	%	16.40	15.90	14.80	-
Carbon Monoxide (CO)	mg/Nm^3	496.00	513.00	534.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	19.00	26.00	34.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	26.00	39.00	46.00	-
Nitrogen Oxide (NO)	mg/Nm^3	96.00	111.00	121.00	-
NOx	mg/Nm^3	122.00	150.00	167.00	600*
Particulate Matter	mg/Nm^3	81.70			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Milligram/Normal meter cube







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Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 25A/ 003934

Stack Emission Monitoring Report

Client Name:	Total Parco Pakistan (T2)	**Reporting Date:**	12-Feb-2025
Job Number:	GCEC-PK-PU-37/2025		

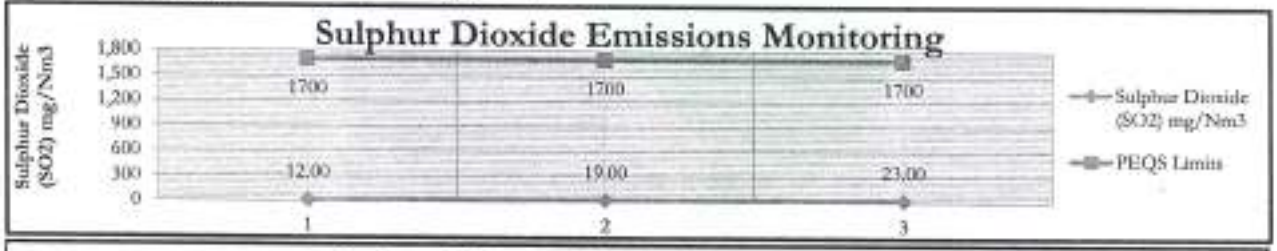
Monitoring Point Details & Monitoring Results

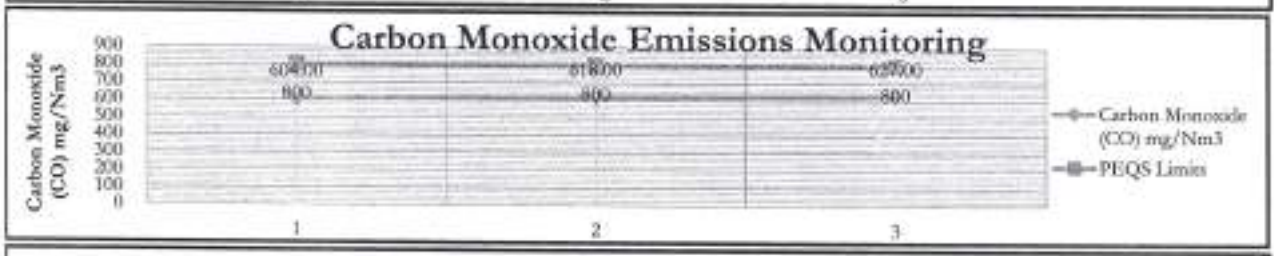
Monitoring Point:	Generator-1	**Monitoring Time:**	14:14
Load:	On Load	**Monitoring Date:**	7-Feb-2025
Fuel Type:	Diesel	**Instrument Used:**	Lancom-IV
Monitoring Location:	Sheikhupura	**Capacity:**	63KV

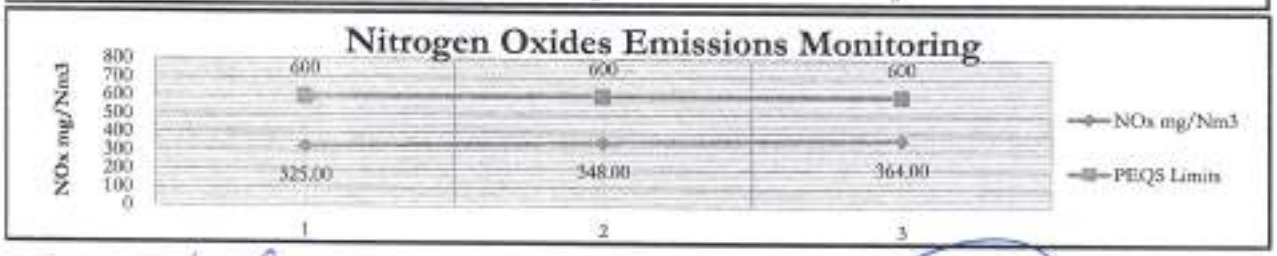
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	4.20	4.60	5.10	-
Oxygen (O2)	%	16.40	15.10	14.20	-
Carbon Monoxide (CO)	mg/Nm^3	604.00	618.00	627.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	12.00	19.00	23.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	91.00	102.00	113.00	-
Nitrogen Oxide (NO)	mg/Nm^3	234.00	246.00	251.00	-
NOx	mg/Nm^3	325.00	348.00	364.00	600*
Particulate Matter	mg/Nm^3	86.30			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Miligram/Normal meter cube







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Stack Emission Monitoring Report

Client Name:	Total Parco Pakistan (T2)	**Reporting Date:**	12-Feb-2025
Job Number:	GCEC-PK-PU-37/2025		

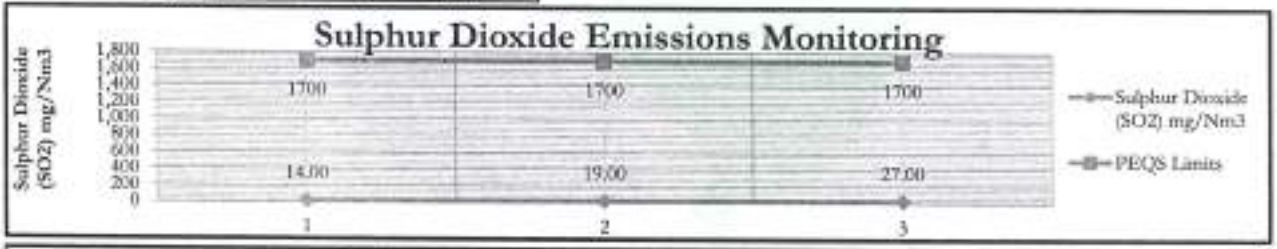
Monitoring Point Details & Monitoring Results

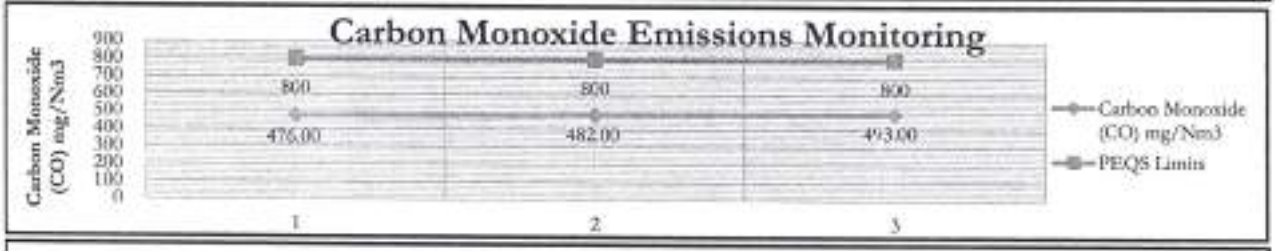
Monitoring Point:	Fire Engine-5	**Monitoring Time:**	14:16
Load:	On Load	**Monitoring Date:**	7-Feb-2025
Fuel Type:	Diesel	**Instrument Used:**	Lancom-IV
Monitoring Location:	Sheikhupura	**Capacity:**	2200 USGPM

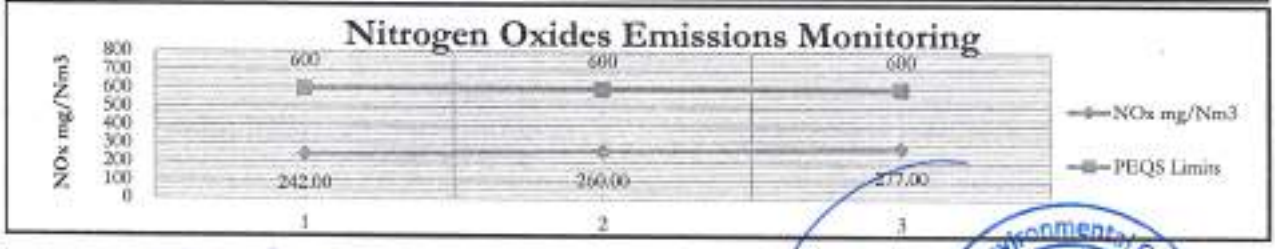
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	8.30	9.10	9.60	-
Oxygen (O2)	%	13.01	11.90	10.60	-
Carbon Monoxide (CO)	mg/Nm^3	476.00	482.00	493.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	14.00	19.00	27.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	16.00	21.00	29.00	-
Nitrogen Oxide (NO)	mg/Nm^3	226.00	239.00	248.00	-
NOx	mg/Nm^3	242.00	260.00	277.00	600*
Particulate Matter	mg/Nm^3	89.63			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Milligram/Normal meter cube







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Stack Emission Monitoring Report

Client Name: Total Parco Pakistan (T2) **Reporting Date:** 12-Feb-2025
Job Number: GCEC-PK-PU-37/2025

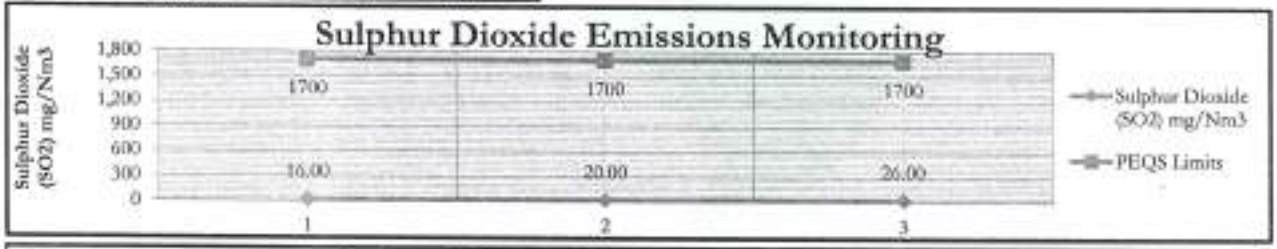
Monitoring Point Details & Monitoring Results

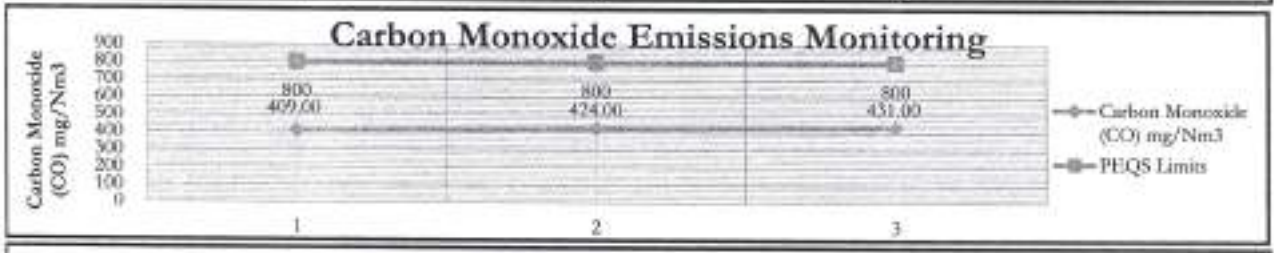
Monitoring Point:	Fire Engine-4	Monitoring Time:	14:20
Load:	On Load	Monitoring Date:	7-Feb-2025
Fuel Type:	Diesel	Instrument Used:	Lancom-IV
Monitoring Location:	Sheikhupura	Capacity:	2000USGPM

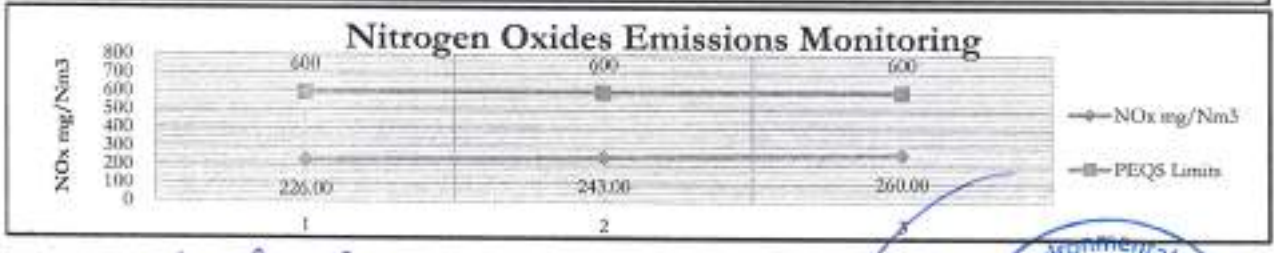
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	5.60	6.90	7.70	-
Oxygen (O2)	%	14.90	13.40	12.90	-
Carbon Monoxide (CO)	mg/Nm^3	409.00	424.00	431.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	16.00	20.00	26.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	19.00	27.00	36.00	-
Nitrogen Oxide (NO)	mg/Nm^3	207.00	216.00	224.00	-
NOx	mg/Nm^3	226.00	243.00	260.00	600*
Particulate Matter	mg/Nm^3	76.50			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Milligram/Normal meter cube







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Stack Emission Monitoring Report

Client Name:	Total Parco Pakistan (T2)	Reporting Date:	12-Feb-2025
Job Number:	GCEC-PK-PU-37/2025		

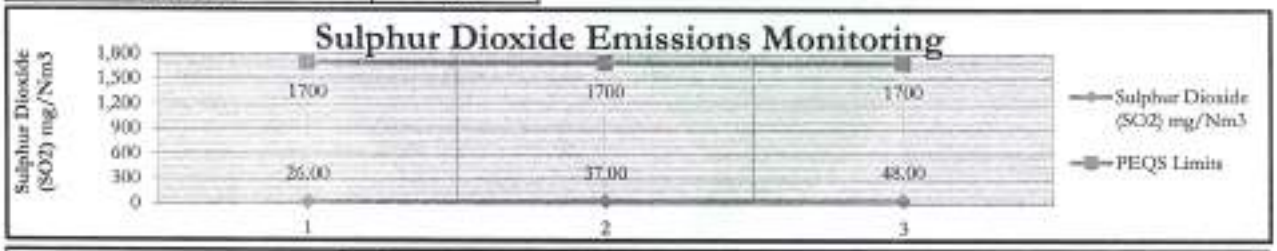
Monitoring Point Details & Monitoring Results

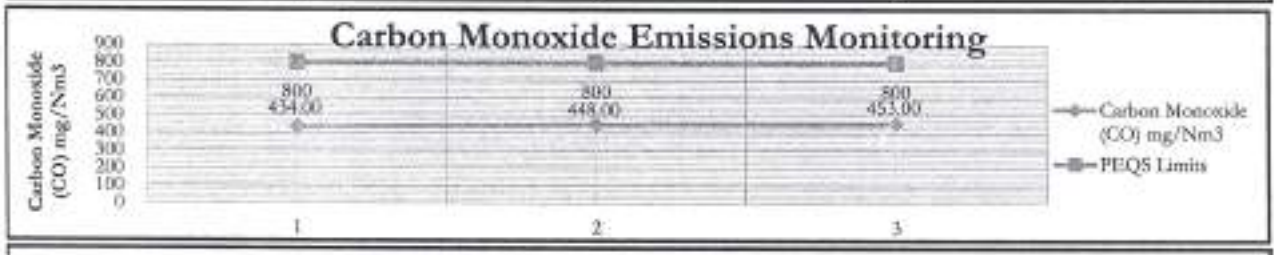
Monitoring Point:	Fire Engine-3	Monitoring Time:	14:23
Load:	On Load	Monitoring Date:	7-Feb-2025
Fuel Type:	Diesel	Instrument Used:	Lancom-IV
Monitoring Location:	Sheikhupura	Capacity:	750 GPM

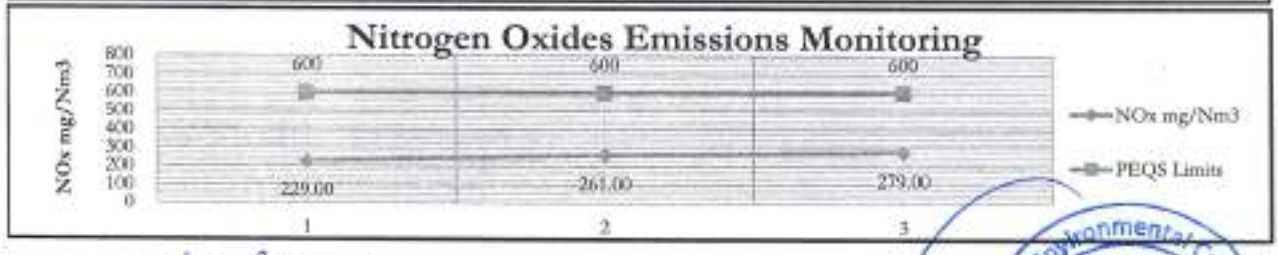
Parameters	Unit	Reading 01	Reading 02	Reading 03	Limits as per PEQS
Carbon Dioxide (CO2)	%	4.90	5.60	6.40	-
Oxygen (O2)	%	16.70	14.90	13.47	-
Carbon Monoxide (CO)	mg/Nm^3	434.00	448.00	453.00	800
Sulphur Dioxide (SO2)	mg/Nm^3	26.00	37.00	48.00	1700
Nitrogen Dioxide (NO2)	mg/Nm^3	31.00	47.00	53.00	-
Nitrogen Oxide (NO)	mg/Nm^3	198.00	214.00	226.00	-
NOx	mg/Nm^3	229.00	261.00	279.00	600*
Particulate Matter	mg/Nm^3	72.61			300
Smoke	Ringlemann	1.00			2

*Levels of NOx according to Fuel type as per PEQS	
Oil Fired	600
Coal Fired	1200
Gas Fired	400

Abbreviations
PEQS=Punjab Environmental Quality Standards
mg/Nm3=Miligram/Normal meter cube







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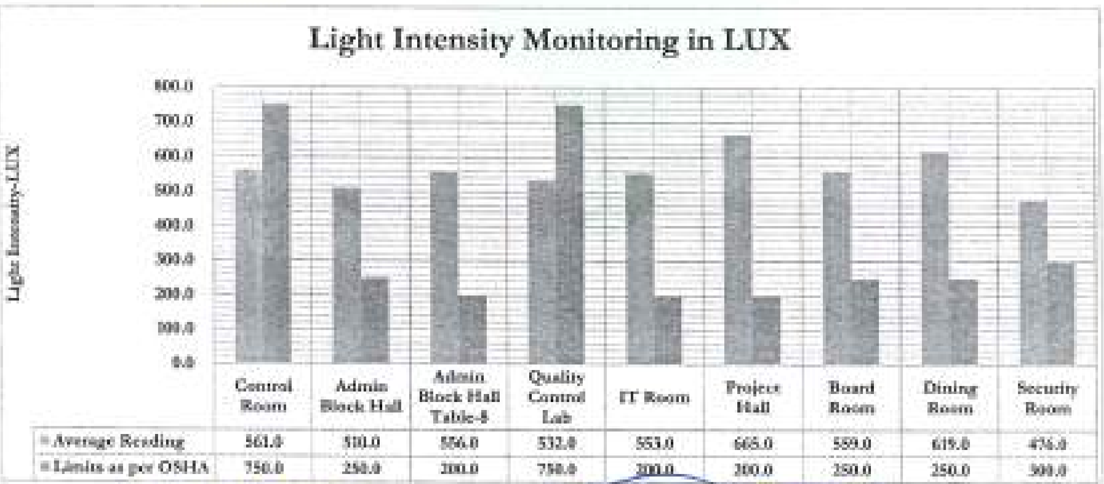
Sr. No# 25A/ 003938

Light Intensity Monitoring Report

Job Ref. Number : GCEC-PK-PU-37/2025 **Reporting Date:** 12-Feb-2025
Client Name: Total Parco Pakistan (T2)
Monitoring Date: 7-Feb-2025
Monitoring Location: Sheikhupura

Monitoring Point Details & Monitoring Results

Sr.No	Points	Unit	Reading 01	Reading 02	Reading 03	Average Reading	Limits as per OSHA
1	Control Room	LUX	564.0	554.0	614.0	561.0	750.0
2	Admin Block Hall		485.0	496.0	563.0	510.0	250.0
3	Admin Block Hall Table-8		546.0	530.0	667.0	556.0	200.0
4	Quality Control Lab		359.0	543.0	542.0	532.0	750.0
5	IT Room		521.0	542.0	516.0	553.0	200.0
6	Project Hall		654.0	678.0	543.0	665.0	200.0
7	Board Room		543.0	531.0	573.0	559.0	250.0
8	Dining Room		586.0	604.0	543.0	619.0	250.0
9	Security Room		447.0	453.0	482.0	476.0	300.0



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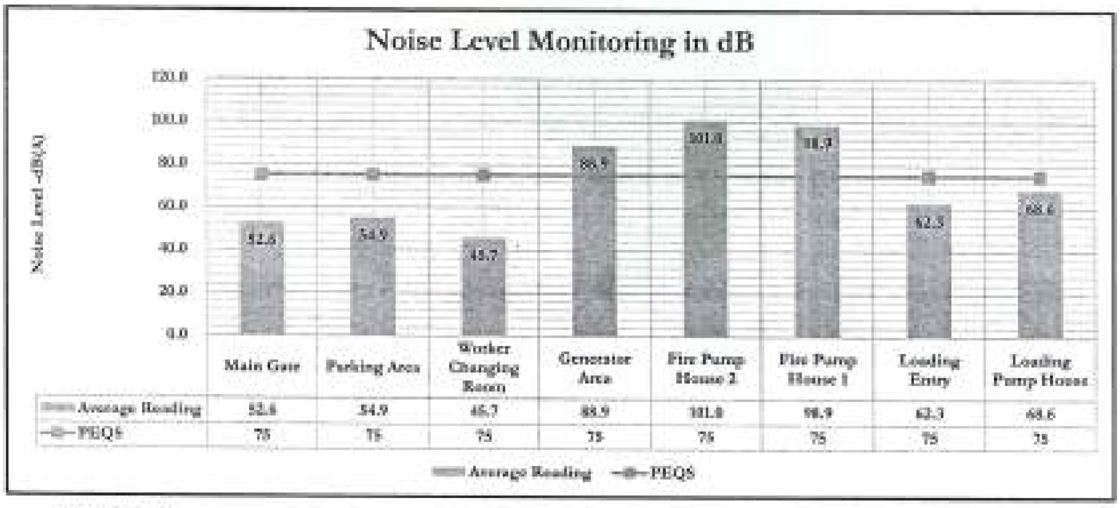
Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 25A/ 003976

Noise Level Monitoring Report

Job Ref. Number : GCEC-PK-PU-37/2025 **Reporting Date:** 12-Feb-2025
Client Name: Total Parco Pakistan (T2)
Monitoring Date: 7-Feb-2025
Monitoring Location: Sheikhupura

Monitoring Point Details & Monitoring Results							
Sr.No	**Points**	**Unit**	**Reading 01**	**Reading 02**	**Reading 03**	**Average Reading**	**Limits as per PEQS**
1	Main Gate	dB(A)	56.4	49.5	51.9	**52.6**	75
2	Parking Area		55.3	51.7	57.6	**54.9**	
3	Worker Changing Room		42.7	46.9	47.6	**45.7**	
4	Generator Area		88.3	91.4	86.9	**88.9**	
5	Fire Pump House 2		96.6	104.5	101.9	**101.0**	
6	Fire Pump House 1		96.9	99.3	100.4	**98.9**	
7	Loading Entry		59.4	61.8	65.8	**62.3**	
8	Loading Pump House		64.6	69.7	71.6	**68.6**	



Abbreviations:
PEQS = Punjab Environmental Quality Standards
dB = Decibel

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Pictorial Evidence for Water Sampling, Ambient Air, Stack Emission, LUX and Noise Monitoring

Figure 1: Drinking Water Sampling from Electric Cooler

Figure 2: Drinking Water Sampling from Office Mess

Figure 3: Waste Water Sampling of Rain Water

Figure 4: Waste Water Sampling of Process Water

Figure 5: Ambient Air Monitoring Near Tank Parking Area

Figure 6: Ambient Air Monitoring Near Generator Area

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Figure 7: Stack Emission Monitoring of Generator 2

Figure 8: Stack Emission Monitoring of Generator 3

Figure 9: Stack Emission Monitoring of Generator 1

Figure 10: Stack Emission Monitoring of Fire Engine 5

Figure 11: Stack Emission Monitoring of Fire Engine 4

Figure 12: Stack Emission Monitoring of Fire Engine 3

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Figure 19: LUX Monitoring of Control Room

Figure 20: Noise Monitoring of Main Gate

Figure 21: Noise Monitoring of Tanker Area

Figure 22: Noise Monitoring of Worker Changing Room

Figure 23: Noise Monitoring of Generator Area

End of Report

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ANNEXURE-D

Certificate of Waste Disposal

Waste Management Solution

Ref: WMS/MACT/CERT02/04/2025

Dated: 27th Apr, 2025

CERTIFICATE OF WASTE DISPOSAL (REUSE /RECYCLING)

Detail of the Waste:

1. **Source** TPPL-T2 Machike Terminal 1 (Parco Gunvor Ltd).
2. **Address** Total Parco Pakistan Ltd, Machike Oil Terminal 1, 7km Sargodha, Sheikhupura.
3. **Date of Collection** 24-04-2025 **Vehicle No.** LEI-6188 **Gate Pass#** 132

SNo.	WASTE DESCRIPTION	QUANTITY	TREATMENT METHODS
01	USED OIL	350 liters	RECLAMATION/ RECYCLE
02	EMPTY DRUMS	07 (Drums)	RECYCLE
03	HAZARADOUS WASTE (COTTON, SEALS ETC.)	35 (KG)	INCINERATE

COMMENTS:

This is to certify that the above quantity of used oil collected from above mentioned address and treated in environmental friendly manner as per applicable guide lines.

WASTE MANAGEMENT SOLUTION

Waleed Siddique
(General Manager)

SEAL OF THE COMPANY

0346-3553185 | 0321-9235918
021-34540346
Plot 110, Sindhi Muslim Society, Block 'B', Shahrah-e-Faisal,Karachi.
www.wms.net.pk
Info@wms.com
wastemanagementsolution@hotmail.com

ANNEXURE-E

LAND DOCUMENTS

XXXIV-A پٹواری فارم نمبر

رجسٹر حقداران زمین مسل میعادی

نقل مطابق اصل

حدبست نمبر ____ تحصیل ____ ضلع ____ سال ____ ورق نمبر ____

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۷۶	۴۵۹ تا ۴۶۶	[illegible] پاکستان					[illegible]	[illegible]	[illegible]	[illegible]			

پٹواری فارم نمبر XXXIV-A

رجسٹر حقداران زمین مسل میعادی ۰۶-۰۵-۲۰۰۴ سلسلہ

نمبر محال [illegible] تحصیل [illegible] ضلع [illegible] سال ۲۰۰۱-۲۰۰۰ نمبر کتاب [illegible] ورق نمبر —

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کیفیت [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	نمبر خسرہ [illegible]	نام کاشتکار مع احوال	کوائف مالک: نام مالک مع [illegible]	[illegible]	[illegible]
				۱۱—۶		بنجر	نیشنل بینک آف پاکستان؛ ۱—۵؛ ۱۳۴	357	430
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T2-3

نقل محال دھنـ پورہ

پٹواری فارم نمبر XXXIV-A

رجسٹر حقداران زمین مسل میعادی

تحصیل — ضلع شیخوپورہ — سال — ورق نمبر —

١	٢	٣ (الف)	٣ (ب)	٣ (ج)	٣ (د)	٣ (ہ)	٤	٥	٦	٧	٨	٩	١٠
[illegible]	[illegible]	نام مالک مع [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	نام کاشتکار مع احوال	نمبر خسرہ مع نام [illegible]	[illegible]	[illegible]	[illegible]	مطالبہ مع [illegible]	کیفیت مع [illegible]
50	180	[illegible] پاکستان	[illegible]	1806/4015	6	90	[illegible]	33	15	200			
								23	15	5			
81	249	[illegible]	[illegible]		10	5	[illegible]	1806/4015	6	90		[illegible]	
									4	99			

13 x/05

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ANNEXURE-F

NOC from Ministry of Energy

No.PL-2(5)/2017-Gen
Government of Pakistan
Ministry of Energy
(Petroleum Division)
Directorate General of Oil
****

Islamabad, the 2nd October, 2018

Chief Executive Officer,
Total Parco Pakistan Limited,
Lahore

Subject: **NOC FOR CONSTRUCTION OF POL STORAGE FACILITY AT MACHIKE, DISTRICT SHEIKHUPURA BY TOTAL PARCO PAKISTAN LIMITED**

I am directed to enclose herewith copy of Ministry of Defence O.M. No.4/9/2006/D-14/N-II dated 15th October, 2018 on the above subject, which is self explanatory.

2. It is requested to take necessary action in the matter.

Encl: As above

(Imran Ali Abro)
Research Officer (M)
051-9201193

Cc:
1. Chairperson, Oil & Gas Regulatory Authority, Islamabad
2. Raja Amjad Mehmood, Section Officer, Ministry of Defence, Rawalpindi
3. GSO-I (M & M), Joint Log Plans Dte, JSHQ, Chaklala, Rawalpindi

→ VP Ops
cc Legal
12/11/2018

ANNEXURE-G

NOC District Co-ordination Officer

OFFICE OF THE DISTRICT COORDINATION OFFICER, SHEIKHUPURA

To

M / s Total Parco Pakistan LTD.,
External Affairs Manager,
119-E-1, Hali Road, Gulberg III,
Lahore

No. HC (G) / Bulk Installation / 102 /831 Dated: 09 / 07 2007

Subject: - **Grant Of No Objection Certificate For Installation of Bulk Oil Storage Facility Under Production & Marketing Rules 1992 At Khewat No. 58, 81, Khatauni No. 188 to 200 / 1, 269, Square No. 19, Kila Nos.6,7,14,15/1,15/2,16,17,18,23,24,25, Square No. 20, Kila Nos. 10,11,20,21 Land Measuring 99-Kanals 04-Marlas In The Name Of Total Parco Pakistan, Mauza Dhant Pura, Tehsil & District Sheikhupura**

Reference your application bearing Ref. No. PL-2 (5) / 2006-TPPL-0501, dated 25th of May, 2006 on the subject cited above.

2. The case was discussed in the meeting dated 13.06.2007 in line with the instructions contained in reference No. STO (PSB) 3-4 / 2005, dated 5th of May, 2007 issued by the Industries Department, Government of the Punjab.

3. The Committee unanimously approved the case. Hence there is no objection to the installation of Bulk Oil Storage Facility at the above mentioned site subject to the possession of license obtained from the Competent Authority in this respect. The construction should be according to the design as approved by the concerned department.

4. It is hereby clarified that, if in future, the situation so warrants, the Provincial / Federal Departments would have the powers to order the shifting and resetting of the said Bulk Oil Storage Facility without any compensation by the department.

5. The approval is subject to the following conditions: -

i. There shall be nothing repugnant to any Government orders / policy on the subject.

ii. The NOC of this office does not absolve the proponent applicant of any statutory / legal obligation applicable on him by Federal / Provincial Department.

iii. The owner will not erect any sort of structure other than authorized in the plan approved by the Competent Authority.

iv. All facilities and safety requirements will be accomplished by the company according to the approved design by the Competent Authority.

v. This No Objection Certificate is liable to be cancelled at any stage in case of any violation of the terms and conditions or if any document is found to be bogus or has been obtained / arranged by misrepresentation.

vi. This No Objection Certificate is subject to issuance of certificate from Ministry of Petroleum and Natural Resources; Islamabad that standard of equipment is commensurate with the international standards.

vii. The proprietor shall provide facilities of drinking water and Lavatory free of cost to the passengers, at the premises.

viii. This No Objection Certificate is issued subject to fulfillment of all the conditions proposed by different agencies who have submitted their NOCs.

ix. The NOC shall be treated as null and void if the conditions mentioned in the NOC are not complied with.

6. The Site Plan is duly countersigned.

District Coordination Officer
Sheikhupura
District Coordination Officer
Sheikhupura

Zila Nazim
Sheikhupura
Countersignature by Zila Nazim, Sheikhupura

ANNEXURE-H

NOC Ministry of Defence

CONFIDENTIAL

No.4/9/2006/D-14/N-II
GOVERNMENT OF PAKISTAN
MINISTRY OF DEFENCE

Rawalpindi, the 15th October 2018

From: - SO (D-14)

To: - Ministry of Energy (Petroleum Division)
Director General Oil
Islamabad

Subject: - NOC FOR CONSTRUCTION OF POL STORAGE FACILITY AT MACHIKE, DISTRICT SHEIKHUPURA BY TOTAL PARCO PAKISTAN LIMITED

I am directed to refer to TOTAL PARCO Pakistan Limited DO letter dated 24-08-2018 (copy enclosed) and to state that Ministry of Defence has No Objection from Defence & Security point of view on the NOC already issued vide Ministry of Energy (Petroleum Division's) letter No. PL-2(5)/2005-TPPL dated 08-12-2005 to TOTAL PARCO Pakistan Limited for their oil storage facility at Machike, District Sheikhupura, subject to observance of following conditions: -

a. Environmental & Social Impact Assessment (ESIA) and oil spill / disaster response strategies be formalized.

b. No foreigner to be employed without police and intelligence clearance.

c. Employees (especially foreigners) to remain restricted to work site during construction phase, if any.

d. Use and carrying of maps, equipment, global positioning system (GPS) and any technical gadgetry other than required equipment on the project site be strictly prohibited.

e. Maximum height of bulk storage tank will be 11 meters.

f. NOC by Civil Administration from safety aspect (if required) be obtained

P.T.O.

ANNEXURE-I

Permission from

Customs

GOVERNMENT OF PAKISTAN
OFFICE OF THE INSPECTOR CUSTOMS
INCHARGE OIL SECTOR MACHIKE SHEIKHUPURA

C. No. :Misc/OIL/13-14
Dated :February 21, 2014

To,

M/S Total Parco Pakistan Ltd.

Machhike, Distt. Sheikhupura.

Subject: **General Standing Permission on Provisional Basis for Receipt / Clearance of POL Products Ex-Machhike Sheikhupura.**

Please refer to the subject captioned above you are therefore directed to furnish the statement regarding receipt/clearance of POL products from PARCO Public Bonded warehouse for reconciliation of transactions made by you up till date.

In this regard you are therefore directed to compliance the custom bonded warehousing rules 1969 and chapter XV of Petroleum Act strictly.

KHADIM HUSSAIN
INSPECTOR CUSTOMS
OIL SECTOR, MACHIKE

Copy forwarded to:-

The Superintendent Customs (Bonds) Dry port Lahore
Incharge PARCO Machhike

KHADIM HUSSAIN
INSPECTOR CUSTOMS
OIL SECTOR, MACHIKE

06/02/14

ANNEXURE-J

Letter from OGRA

OIL & GAS REGULATORY AUTHORITY

OGRA (Oil)-19-3(1)/2014

March 9, 2015

The Chief Executive Officer,
Oil Companies Advisory Council,
Islamabad.

Subject: **MARKETING OF PETROLEUM PRODUCTS WITHOUT AUTHORITY's PERMISSION**

Dear Sir,

Oil & Gas Regulatory Authority (OGRA) grants permission for establishing Oil Marketing Company (OMC) as per GOP policy. Certain conditions (I - v) of such permission are reproduced hereunder:

(i) Investment for first three years shall not be less than Rs. 500 Million and based on 60:40 debit equity ratio.

(ii) The company will construct/ develop minimum storage of 20 days of its proposed sales as infrastructure prior to beginning sales (including direct sale to the bulk consumer i.e. Pakistan Railways, PIA etc.) in the country.

(iii) The company will construct / develop the requisite storages at all locations/ areas corresponding to their business strategy and sales volume, so that no shortage of POL products takes place.

(iv) The company will develop storages at location/ model of IFEM or at nearest points to these locations.

(v) The company cannot construct "repeat cannot construct"/ develop/ own any retail outlet across the country prior to ensure compliance with condition (i) to (iii) above.

2. As clear from the above conditions, such companies are not allowed to construct/ develop/ own any retail outlet across the country prior to completion/ inspection of requisite storage infrastructure and subsequent permission in writing by the Authority for marketing of petroleum products. However, it has been observed that such companies try to deviate from their obligation by constructing/ operating the outlets during the period in which they are not supposed to do the same.

3. Further, OGRA is also aware of the fact that violation by such companies would not be possible without the supplies of petroleum products from the OMCs or Oil Refineries.

4. Considering all above, OCAC is advised to direct all OMCs/ Refineries not to release any petroleum product to such permission holders (list attached) which have not been issued any licence for marketing.

RECEIVED
11 MAR 2015

Yours Truly,

Sarmad Aslam
Executive Director (Oil)
For and on behalf of the
Oil & Gas Regulatory Authority

CC: All OMCs & Refineries

54-B, Fazal-e-Haq Road, Blue Area, Islamabad, Pakistan.
Tel: +92-51-9221715-18, Fax: +92-51-9221714

ANNEXURE-K

Railway Pakistan Permission Letter

PAKISTAN RAILWAYS

DIVISIONAL SUPERINTENDENT OFFICE LAHORE

☎ 042-99201939, Email: den3lhr@yahoo.com

No.639-W/126/Total/2018/WC-5 Dated:-14/06/2019.

The Manager Depot Operations,
Total Parco Pakistan (LTD)
10,Tariq Block new Garden,
Town Lahore 54700.

Sub: - **CROSSING FOR 16" DIA M.S CASING PIPE TO PASS 12" DIA M.S CARRIER PIPE UNDER THE RAILWAY TRACK AND ALONG THE TRACK FOR PETROLEUM PRODUCT FROM KM.41/14 TO 42/1 BETWEEN QILA SHEIKHUPURA TO FAROOQABAD STATION ON SHAHDARA BAGH TO SANGLA HILL SECTION.**

The Divisional Tracing plan No.Misc-76/SDR-SLL/2018//LHR bearing H.Q.E plan No.39210 along with Chief Engineer/Open Line, Pakistan Railways, Headquarters Office, Lahore letter No.1002-W/53/2018/WC-2018 dated 23.05.2019 and Federal Government Inspector, Pakistan Railways, Headquarters Office, Lahore letter No.221/W dated 21.05.2019 is sent herewith for necessary action.

You are hereby allowed to execute the subject work as per instructions issued vide Federal Government Inspector, Pakistan Railways, Headquarters Office, Lahore letter No.221/W dated 21.05.2019 under the supervision of Railway administration.

DA/As above.

(Muhammad Ahmad Qureshi)
Divisional Executive Engineer-III,
For Divisional Superintendent,
Pakistan Railways, Lahore.

Copy to:-

1. Chief Engineer/Open Line, Pakistan Railways, Headquarters Office, Lahore in reference to his letter cited above.
2. Assistant Executive Engineer, Pakistan Railways, Qila Sheikhupura for information and necessary action (DA/Attached).
3. Inspector of Works, Pakistan Railways, Qila Sheikhupura to ensure the execution of work as per approved plan and directive of FGIR.
4. Permanent Way Inspector, Pakistan Railways, Qila Sheikhupura to ensure the execution of work as per approved plan and directive of FGIR.