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EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the findings of the Environmental Impact Assessment Report for Construction of **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)** located at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore. To fulfill the statutory requirements, Environmental Impact Assessment of the proposed project has been conducted in accordance with the Punjab Environmental Protection Act (Amended), 2012 and IEE/EIA Regulations 2022. The process of conducting environmental assessment and the results of EIA are described in this document.

SALIENT FEATURES OF PROJECT

Proponent Name	Ikram ul Haq Subhani PRESIDENT ALKHIDMAT FOUNDATION PAKISTAN, CENTRAL PUNJAB
Project Title	PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)
Project Capacity	120 Beds
Project Location	33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore Co-ordinates: 31°17'31.0"N 74°24'13.5"E
Consultant Name	TETRATECH Environmental Consultancy
Nature Of The Area	Commercial and Residential
Archaeological/Historically Important Site	None within the 10 km radius
Surface Water Body	No surface water body in the form of river or canal is present near the project site

Forest Area/National Park	None
Seismicity	2A-Medium Intensity Level
Nearby Habitation	Kot Maila Ram (1 km)
Source of Water	Ground Water (550 ft)
Water Requirements	During construction works water is used for concrete preparation, watering the construction sites, as well as for ensuring proper conditions for workers. Taking into account that construction activities will be implemented on one working site. In total water consumption for construction phase will comprise 18.25 m ³ / day. Water used for concrete preparation and watering the construction site is considered as non-return water. Wastewater originated as a result of drinking water consumption is estimated at 1.18 m ³ /day.
Wastewater	Domestic wastewater will be treated in septic tank before discharging to the sewer line.
Source of Power	WAPDA/ Self generation
Cost of Project	1 Billion PKR
Area of the Project	• Total Plot Area: 1 Acre • Covered Area: 79,701 SFT • Open Area: 18,336
Solid Waste	During the construction and operation phases, solid waste will be transported to the city's waste dumping site. Whereas,

	biomedical waste will be dealt with intense care and for final disposal will be sent to the incinerator through contracted vendor.
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PROJECT OBJECTIVES

The objectives of the proposed project are to:

- Develop hospital of national building standards, with quality building design, accommodations and medical equipment.
- Provide quality healthcare in a safe, comfortable and welcoming environment for the patients and staff.
- Manage the increasing health care demand of the area.
- Meet the need of better healthcare facilities.
- Create new employment opportunities to the medical professionals as a part of the project activities scope opportunity.

DESCRIPTION OF THE PROJECT

The proponent intends to develop a 120-bed multi-storey hospital at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore that offers a comprehensive range of general, secondary and some tertiary medical services. Hospital will have different departments to cater the patients. The following service portfolio will be provided over the course of the **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)** development

Emergency Services

- Pediatrics
- Trauma
- Surgical
- Medical
- Obstetric

Out Patient Clinics

- Medical and Allied Specialties
- Surgical and Allied Specialties
- Pediatrics and Obstetric Services

Hotel Rooms

- ICU (Including Pediatrics & Neonatal)
- CCU
- Diagnostics

Operation Theatres

- General Operation Theatres
- Delivery Suits
- Recovery Rooms

SITE ALTERNATIVES

The proposed project site does not fall in any environment sensitive area. There are no National Parks/Sanctuaries, Historical places/places of tourist importance within 10 km radius as well as no tree cutting is involved. Therefore, no alternative sites were considered for this proposed project.

SCREENING

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the Proposed construction falls in Schedule II- EIA **category H“URBAN DEVELOPMENT AND TOURISM”** with sub-category 4-. Public facilities with significant off-site impacts (e.g. hospital wastes).

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES**Assessment of the Impacts during Construction**

While the project's construction poses certain environmental risks, these are short term, and/or easily reversed. The major effects expected during the construction phase include: soil pollution caused by spillage from construction machinery; surface/ground water contamination as well as minimal levels of air and noise pollution. There is also expected to be an increase in the congestion of vehicular traffic and solid waste, however these negative impacts are short term. Positive impacts highlighted include the social benefits of migrant worker influx and the micro-economic development this will induce in the local area.

Mitigation Measures

- A management system for the control of vehicular emissions to be instituted.
- All loose material to be kept on site for the shortest possible time and provided with suitable covering.
- Ambient air quality within the premises of the proposed project site to be monitored.
- Implement good working practices to minimize noise and also reduce its impacts on human health (ear muffs, safe distances, enclosures).
- No machinery to be running when not required.
- Acoustic mufflers/enclosures to be provided.
- All solid waste to be appropriately disposed of in drums or specified containers.
- No untreated discharge to be leaked to surface water, groundwater or soil.
- Care taken in disposing wastewater generated such that soil and groundwater resources are protected.
- Ensure drainage system and specific design measures are working effectively for effluent management.
- Implement waste management plan that identifies and characterizes every waste product associated with proposed activities and that identifies the procedures for collection, handling and disposal of each type of waste.

Assessment of the Impacts during Operation

There is expected to be a significant generation of biomedical waste during the project's operation, which is likely to pose health risks if they are not safely discarded. Air pollution may result from emissions from generators and vehicles, while ambient noise levels are threatened by the operation of the generators. There is no foreseen effect on ground water, and with an effective mitigation program, impacts on surface water quality are easily managed. Several positive impacts can be identified as a result of the introduction of the Hospital in the area, including; the establishment of a hospital in employment opportunities, enhancement of public health and safety and induced development.

Mitigation Measure

- Stack emissions from generators shall be optimally monitored
- Maintenance of internal roads to avoid dust generation
- Noise generated from operation of generators shall be optimized and monitored.
- Generators will be provided with acoustic enclosures.

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

- No untreated discharge shall be leaked to surface water, groundwater or soil.
- Care shall be taken in disposing wastewater generated, such that soil and groundwater resources are protected. The wastewater generated during operation shall be treated prior to final disposal in wastewater treatment plant.
- Adequate number of collection bins shall be provided solid waste. However, biomedical waste will be treated in incinerator.
- Fire protection and safety measures shall be adopted to take care of fire and exposure hazards, to be assessed and steps will be taken for their prevention.

Scoping:

The key activities of this phase include:

Project Data Compilation:

A generic description of the activities relevant to environmental assessment is compiled with the help of the proponent.

Published Literature Review:

Secondary data on weather, water resources and vegetation, and other relevant environmental features of the project area and the similar projects, is reviewed and compiled.

Legislative Review:

Information on relevant legislations, regulations, guidelines, and standards is reviewed and compiled.

Identification of Potential Impacts:

The information collected is reviewed and potential environmental issues are identified.

Identification of Mitigation Measures:

Mitigation measures are identified for all the likely impacts in order of preference for avoiding the impacts altogether, minimizing their frequency or extent and compensating or rectifying the losses; as may be found practicable in the project.

Selection of Alternatives:

Based on the potential impacts and the cost required to mitigate them, most crucial project employing the best available technology at the most feasible site is selected.

Scoping Meeting:

A scoping meeting is held to share this basic level of project information with all the project stakeholders before the information is incorporated into the report, so that some improvement can be sought out in the data as may be necessary, better or more friendly

alternatives can be selected, and better and more practicable mitigation measures can be suggested.

PROPOSED MONITORING

During construction phase ambient air quality for dust level in particular, vehicle and equipment exhaust, noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored. During operational phase solid and biomedical waste management, wastewater treatment, housekeeping, parking management and monitoring of fire-fighting gadgets is required.

ENVIRONMENTAL CONSULTANTS

Environmental Impact Assessment report has been prepared to identify and assess the significant environmental impacts likely to occur due to operation along with environmental impact statement followed by delineation of appropriate Environmental Management Plan as well as the monitoring requirements to have a control over the adverse environmental impacts and to check the efficiency and effectiveness of the mitigation measures being implemented. Proponent has engaged **M/S TETRATECH** Environmental Consultancy to conduct EIA of the proposed project to meet the above mentioned targets, and to get Environmental Approval from Environmental Protection Agency (EPA) Punjab.

CONCLUSION

The Environmental Impact Assessment contains description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan for both construction and operation phase has also been included in this study. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these can be within acceptable limits. It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context.

1. INTRODUCTION

1.1 PURPOSE OF REPORT

The main objectives of this EIA study are:

- To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the proposed project in that area.
- To identify pre construction, construction and operational activities and to assess their impacts on environment.
- Provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- To provide an opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.
- Prepare an EIA Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

1.2 IDENTIFICATION OF PROJECT & PROPONENT

1.2.1 Identification of Project

The proposed project is the “**PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)**” Located At 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore.

1.2.2 Proponent

Name: Ikram ul Haq Subhani

Designation: President Alkhidmat Central Punjab

Address: House No # 711, Block J-2, Johar Town Lahore

Phone: 0321-4989420

1.3 DETAILS OF CONSULTANT

For the preparation of the EIA Report of the proposed project, the proponent has hired the services of the environmental consultants; **M/S TETRATECH Environmental Consultancy**. Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report. The following table lists the names of those experts:

Table 1: List of Experts

Name of expert	Position held	Highest Qualification
Dr. Mateen Shafqat	Chief Advisor	PhD Environmental Sciences, PMAS, Arid Agriculture University
Kamal Ahmed Cheema	Chief Environmentalist	M. Phil. Environmental Economics, PIDE, Islamabad
Mr. Shahzaib Ahmed	Social Scientist	M. Phil Development Studies, PIDE, Islamabad.
Jawad Shafiq	Environmentalist	BS Environmental Sciences University of Gujrat
Amna Munawar	Environmentalist	MS Environmental Science, Lahore College for women university.
Tayyaba Salim	Environmentalist	BS (Hons) Environmental Science, Lahore college for women University.

1.4 PROJECT NATURE, SIZE AND LOCATION

Project Nature: The proposed project is the construction of hospital. The hospital is designed to provide quality healthcare in a safe, comfortable and welcoming environment, for the patients and staff.

Project Size: The proposed project intends to accommodate 120 beds.

Location: The proposed project site is located at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore. The proposed site is located at 31°17'31.0"N

74°24'13.5"E.

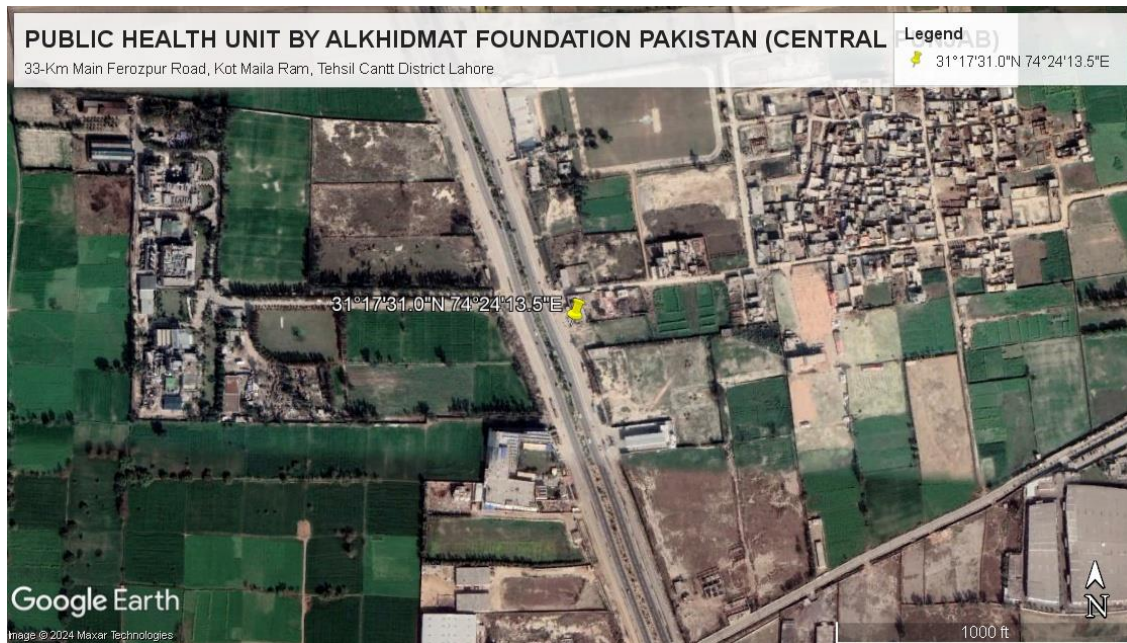


Figure 1: Proposed Project Location (source: Google Map)

2 LEGAL REQUIREMENTS

The rules and regulations regarding the environment in Pakistan are in large number. These include federal and provincial laws, regulations, statutes and treaties. Some of the important of them are Punjab Environmental Protection Act, 1997 Amended 2012, Punjab Environmental Quality Standards (PEQS) 2016, Environmental Samples Rules, 2001, Hazardous Substances Rules, 2003, Hospital Waste Management Rules, 2000.

The Punjab Environmental Protection Act, 1997, Amended 2012 is the key legislation empowering the government to frame regulations for the protection of the environment. Detailed rules, regulations and guidelines required to enforce the Environmental Protection Act are still in various stages of development. It provides for the protection, conservation, rehabilitation and improvement of the environment; for prevention and control of pollution and for the protection of sustainable development.

2.1 NATIONAL ENVIRONMENTAL POLICY 2005

Government of Pakistan has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts. The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of biodiversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

2.2 PAKISTAN ENVIRONMENTAL PROTECTION ORDINANCE (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO). It was the first legislation promulgated for the protection of environment. According to PEPO, 1983, it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

2.3 PUNJAB ENVIRONMENTAL PROTECTION ACT, 1997 AMENDED 2012

The Act is applicable to a broad range of issues and extends to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Some portions from the Act are reproduced below for reference purposes.

- Section-11: Subject to the provisions of this Act and the rules and regulations made there under no person shall discharge or emit or allow the discharge or emission of any effluent or waste or air pollution or noise in an amount, concentration or level which is in excess of the Punjab Environmental Quality Standards.
- Section-12: No proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an Initial Environmental Examination (IEE) or, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained from the Federal Agency approval in respect thereof.
- Section-14: Subject to the provisions of this Act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle or import any hazardous substance except (a) under a license issued by the Federal Agency and in such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party.

2.4 PAKISTAN ENVIRONMENTAL PROTECTION AGENCY REVIEW OF IEE AND EIA REGULATION, 2000

The Pakistan Environmental Protection Agency Review of IEE and EIA Regulations provide the necessary details on preparation, submission and review of the IEE and EIA.

Categorization of projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts. Project types listed in Schedule-II are designated as potentially less adverse effects. Schedule-I projects require an IEE to be conducted, rather than a full-fledged EIA, provided they are not located in environmentally sensitive areas.

Salient features of the regulations relevant to the proposed project are listed below:

- Categories of projects requiring IEE and EIA are issued through two schedules attached with the Regulations. Oil and gas extraction projects including exploration, production, gathering systems, separation, and storage are included in an IEE category.
- The IEE/ EIA must be prepared, to the extent practicable, in accordance with the Pak-EPA environmental Guidelines discussed in the sections to follow.
- A fee, depending on the cost of the project has been imposed for review of the IEE and EIA.

- The submittal is to be accompanied by an application in prescribed format included as Schedule-IV of the Regulations.
- The EPA is bound to conduct a scrutiny and reply within 10-days of submittal of report (a) confirming completeness (b) asking for additional information, or (c) requiring additional studies.
- The EPA is required to make every effort to complete the review process for the IEE within 45-days, and of the EIA within 90-days, of issue of confirmation of completeness.

When EPA accords their approval subject to certain conditions, the following procedure will be followed:

1. Before commencing construction of the project, the proponent is required to submit an undertaking accepting the conditions.
 2. Before commencing operation of the project, the proponent is required to obtain from the EPA a written confirmation of compliance with the approval conditions and requirements of the IEE/ EIA.
- There is a requirement for an EMP to be submitted with the request for obtaining confirmation of compliance.
 - The EPA is required to issue confirmation of compliance within 15-days of receipt of request and complete documentation.
 - The IEE/ EIA approval will be valid for three years from date of accord.

The regulations of monitoring report are required to be submitted to the EPA after the completion of construction followed by annual monitoring reports during operations.

2.5 PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

EPA sustains qualitative and quantitative standards for the discharge of effluents, wastes, air emissions or noise either for general applicability or for a particular area or from a particular source in the form of Punjab Environmental Quality Standards (PEQS). Pakistan Environmental Protection Act 1997 establishes the following discharge concentration standards:

- Maximum allowable concentration of the Pollutants, (32 parameters) in emission and liquid industrial effluents discharged to inland waters, sewerage treatment and the sea
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emission
- Exhaust emissions

- Noise level from vehicles

- Drinking Water
- Ambient Air Quality

2.6 LABOUR LAWS

Construction and operational activities during the course of the project may affect occupational health and safety of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment, and provide their employees at all scales and levels with their due rights. The proponents shall ensure that the labor force engaged at the project site is not exposed to any danger by monitoring the contractor's work frequently.

2.7 PUNJAB HOSPITAL WASTE MANAGEMENT RULES, 2014

Every hospital shall be responsible for the proper management of waste generated till its final disposal in accordance with the provision of this Act. Waste Management Plan shall be prepared and this plan will include every detail from waste collection points to training programmes and emergency procedures. Punjab Hospital Waste Management Rules include:

- Waste Segregation
- Waste Collection
- Waste Transportation
- Waste Storage
- Waste Disposal
- Accidents and Spillages
- Waste minimization and Reuse.

3 DESCRIPTION OF THE PROJECT

3.1 TYPE AND CATEGORY OF PROJECT

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 the proposed project falls in Schedule II-EIA **category H-“URBAN DEVELOPMENT AND TOURISM”** with sub-category 4- . Public facilities with significant off-site impacts (e.g. hospital wastes).

3.2 PROJECT OBJECTIVES

The objectives of the proposed project are to:

- Develop hospital of national building standards, with quality building design, accommodations and medical equipment.
- Provide quality healthcare in a safe, comfortable and welcoming environment for the patients and staff.
- Manage the increasing health care demand of the area.
- Meet the need of better healthcare facilities.
- Create new employment opportunities to the medical professionals as a part of the project activities scope opportunity.

3.3 ALTERNATIVES

3.3.1 Site Alternative

The proposed unit will be located at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore. The site is considered suitable because of the following features:

- The proposed site falls under the jurisdiction of the proponent and has been donated by donor for the construction of a hospital. It has been observed to be almost level in topography, with sparse vegetation located inside the site area.
- The Proposed Project site is located at Main Ferozpur Road, which is very well connected with other parts of the country. Availability of infrastructure facilities such as water supply, power, roads, social infrastructure and man power.
- No national park or wildlife habitat falls within 10 km radial distance from proposed project site.
- The site is not dangerous for public safety.

- No endangered fauna/flora has been observed near the project site.
- The proposed site does not fall in any category of protected or environmentally sensitive area.

The location of project is best suited for proposed activities. So no alternative for site is analyzed.

3.3.2 Project Alternative

The idea is to develop a hospital of international standards, with quality building design, accommodations and medical equipment. The hospital will seek to become an energy efficient building with the collaboration of Punjab Energy Efficiency and Conservation Agency (PEECA) facility with the purpose of capacity building of design professional, material manufacturers and research cooperation.

Healthcare is undergoing a major transformation process, and only those organizations which are able to provide superior quality and value with sustainable funding will survive in the increasingly competitive environment. The increasing demand for state-of-the-art healthcare services the proposed hospital provides a unique opportunity to position itself as the leading private healthcare provider in the area.

A sustainable competitive advantage will therefore be built upon the framework of a clear and focused strategy to provide Clinical Services and dedicated care, enabled by state-of-the-art technology.

3.4 PROJECT DESCRIPTION

3.4.1 Components of the Project

The project will comprise of 120-beds including 20 intensive care beds with state-of-the art multi-storey building. The hospital will have consultant rooms, patient rooms and hotel rooms. The distribution of rooms and consultant rooms is given in **Table 2**.

Table 2: Distribution of Consultant Rooms

Sr.No.	Consultant Room Distribution
1.	Internal Medicine
2.	Surgeon/Urologist/Neurosurgeon
3.	Orthopedic Surgeon/ Hand Surgeon
4.	Cardiologist
5.	Gastroenterology
6.	Pulmonology

7.	Eye Specialist
8.	ENT Specialist
9.	Gynecologist/Obstetrics
10.	Psychiatrist
11.	Dermatologist/Cosmetologist
12.	Pediatricians
13.	Onchologist

Specialist focus and super-specialties will include:

Cardiology/Cardiothoracic Surgery: These services will include catheterization, pacemaker implant, open heart surgery, coronary intensive care, as well as ECG and cardiology services.

Neurology /Neurosurgery: This service will focus on one of the leading causes of morbidity and mortality - stroke. **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)** will become the market leader in neurology services, providing full-fledged diagnostic facilities. Treatment will include the full range of physiotherapy and occupational therapy services.

Gynecology: Hospital will provide best gynecology services through specialized doctors and team.

Urology: This will include all major diagnostic services as well as Lithotripsy. The services will be complemented by a dialysis unit, which will serve both inpatients and outpatients.

Intensive Care Specialists: This will clinically support the services within the ICU/CCU unit.

Haematology/Oncology: Services will provide outpatient chemo-therapy focused cancer treatment.

Gastroenterology: Will include all modalities of diagnostic and therapeutic evaluations and treatment.

Pulmonology: To provide diagnostic and therapeutic care for the high incidence of respiratory ailments.

3.4.2 Project Area

The total area of the plot is 1 Acre. The schedule of area is given below:

Total Plot Area:	1 Acre
Total Covered Area:	79,701 SFT

Total Open Area: 18,336 SFT

3.4.3 Infrastructure Requirement

The infrastructure requirement for the proposed project has been broadly classified into the following two categories:

1. Basic Infrastructure: includes construction material, water supply, drainage power, and parking.
2. Environmental Infrastructure: comprising drainage and sewage system, biomedical and solid waste management and green areas/landscaping.

3.4.3.1 Basic Infrastructure Requirement

Construction Material

The major materials required for construction of the proposed project will be steel, cement, bricks, metal, flooring tiles/stones, wood, sanitary and hardware items, electrical fittings, water and roof materials.

Water

During the construction stage, water will be sourced from ground through tankers, and stored. During construction works water is used for concrete preparation, watering the construction sites, as well as for ensuring proper conditions for workers. Taking into account that construction activities will be implemented on one working site. In total water consumption for construction phase will comprise 18.25 m³/ day. Water used for concrete preparation and watering the construction site is considered as non-return water. Wastewater originated as a result of drinking water consumption is estimated at 1.18 m³/day. To supply the anticipated demand during operations, a 150,000 gallon cistern for water storage will be constructed.

Storm Water Drainage System

In general, the rainwater from terraces and other elevated open areas shall be collected through rainwater down-take pipes and connected to catch basins. The rainwater from hard courts and landscaped areas shall be collected by catch basins through a RCC pipe network, or open drains with gratings, and connected to the storm water channels. Water from the roofs will flow through downpipes, into manholes and to the untreated water tank.

Power

The developers have been assured by the public utility company that there is adequate capacity to meet the demands of the facility, as well as any future expansions. Power will be supplied by LESCO. It is proposed that a back-up power supply of 2 Generators of 800 KVA each will be installed to power critical loads only, in the event of any emergency. These generators shall be silent sets housed in approved acoustic enclosures, so as to control the noise pollution to 55/45 dBA at 1 m distance.

3.4.3.2 Environmental Infrastructure

Municipal and Biomedical Waste Generation

It is envisaged, that about 480-500 kg of solid waste will be generated from the project, and in this about 48-50 kg of Bio-medical waste will be generated. During the construction and operation phases, solid waste will be transported to the city's waste dumping site. All hospital waste deemed hazardous to the environment will be sent to the designated incinerator by contracted vendor.

Sewage System

PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB) intends to adopt automatic sterilization (autoclave) technique which generates zero wastewater. Whereas domestic sewage will be treated in septic tank and then discharged into the main sewer line.

Green Area/Landscaping

Within the proposed project site approximately about 30% of the total space has been designated for green areas. This will achieve a blend between modern buildings and various species of plants, shrubs and fountain attractions, to create a clean, healthy and aesthetic environment that provides a visual retreat and relaxation to the occupants of the building. A combination of evergreen trees and ornamental flowering trees and shrubs will be used.

Firefighting and Emergency Plan

The basic system for Fire Fighting shall be designed. For fire protection, provision is being made for a fire water storage tanks. The capacity of these tanks would be 29849 and 24725 gallons. Water from these reserve tanks will be drawn during emergency situation. Assembly points will be set and proper training will be provided to the workers and staff.

3.4.4 Manpower

20-25 workers including 4-5 engineers will be hired for construction phase. The staff for operational phase will be hired with respect to concerned department according to their qualification.

Table 3.1: Number of Persons/Labor

Sr.No.	Department	Persons Required
1.	Consultant Rooms	100
2.	Paramedical Staff	300-400

3.5 LOCATION AND SITE LAYOUT OF PROJECT

The proposed project site is located at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore.

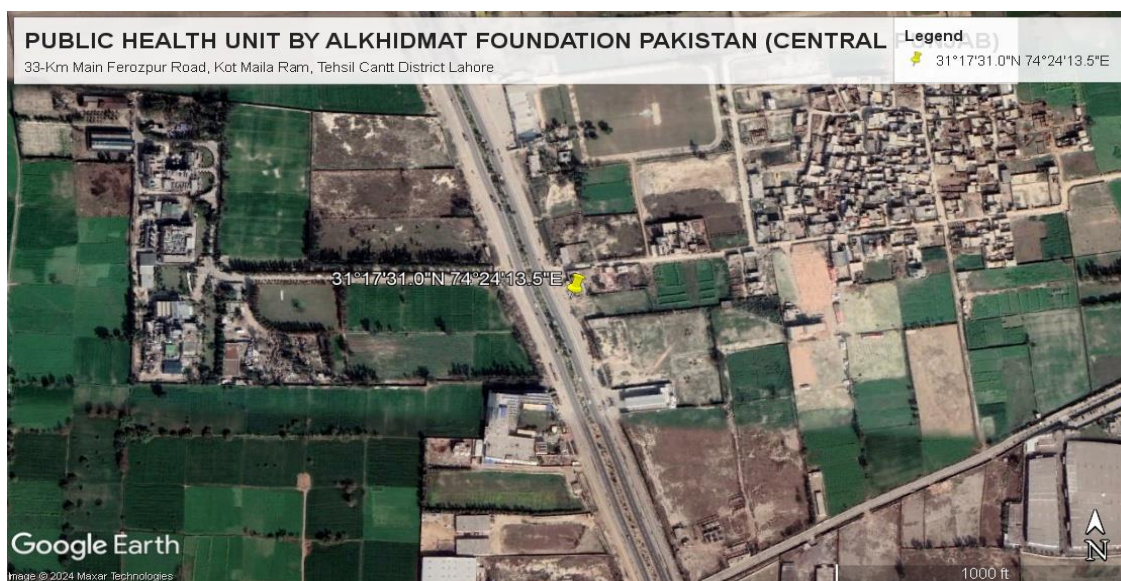


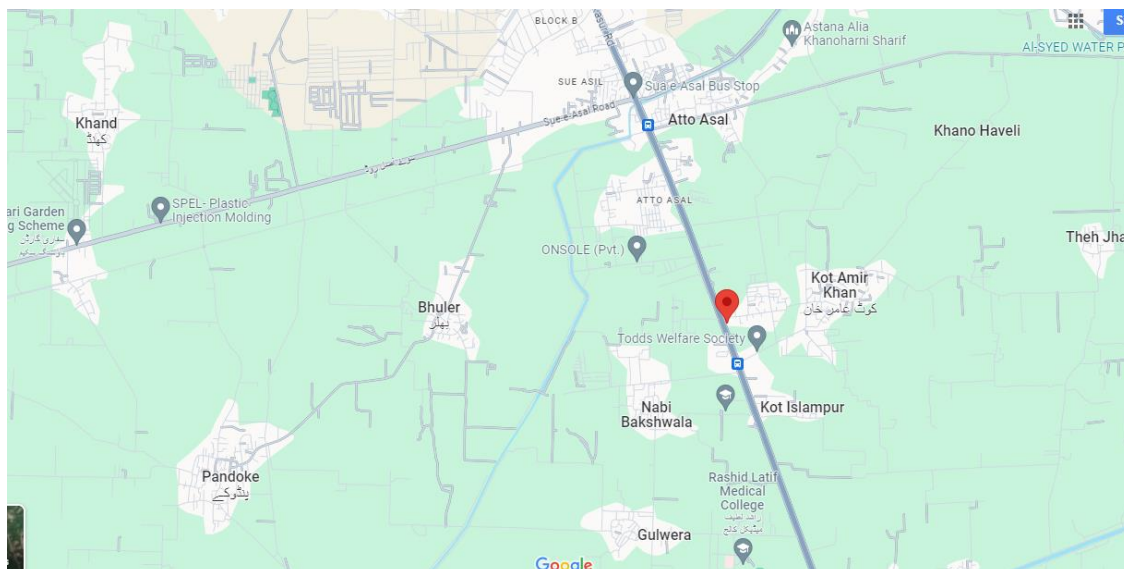
Figure 2: Location of Proposed Hospital

3.6 LAND USE OF SITE

The land is owned by proponent. The area surrounding the project site has predominantly been used for housing development. This specific site has been selected for the aforesaid project.

3.7 ROAD ACCESS

The proposed site is accessible through main Ferozpur Road.



3.8 VEGETATION FEATURES OF THE SITE

Proposed project site has scattered vegetation with shrubs. No major tree cutting is involved.

COST OF PROJECT

The total cost of the project is PKR 3.3 Billion. Breakdown of cost is given in Table 5.

Table 2: Breakdown of Cost

Component	Cost
Building Construction	100 m
Medical Equipment/Machinery	500 m
Hospital Furnishing	187 m
Administration	30 m
Pharmacy/Medicine	60 m
Laboratory	50 m
InPatient Wards	30 m
Outpatient Department	40 m
Landscaping	20 m
Fire Fighting/PPEs	1.5 m
Solid Waste Management	1.5 m
Total	3.3 Billion

3.9 COST AND MAGNITUDE OF OPERATION

The cost of construction for the proposed project would be 1 Billion PKR. The

activities involved in the construction phase will include site clearance, excavation, foundation, utilities (electrical, water, gas). However, budget will be allocated for purchase and maintenance of standardized PPEs for workers, tree plantation and for waste management and environmental enhancement.

3.10 SCHEDULE OF IMPLEMENTATION

Project development will be executed as soon as the no objection certificate from the environmental protection agency, Punjab will be issued and after getting other required approvals. However, the schedule of implementation for the commencement of the civil work involved for the construction of **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)** is approximately 10 months and the detail timeline of the construction period is given in Table 6.

Table 3: Schedule of Implementation

Sr. #	Activities	2.5 Months			2.5 Months			2.5 Months			2.5 Months		
		4W	4W	2W	4W	4W	2W	4W	4W	2W	4W	4W	2W
1	Detailed Designing												
2	Mobilization of Contractors												
3	Development Period												
4	Peak installation Period												
5	Plantation at Site												
W=Weeks													

3.11 RELOCATION AND RESETTLEMENT PLAN

No human population resides within project area. No structure of any significance (cultural, religious, archaeological, recreational or any other) stands on the land selected for the project. No flora or fauna; especially belonging to endangered species is found within a safe distance from the site which is to be removed or moved to some other part. Hence, no relocation and resettlement is required.

3.12 GOVERNMENT APPROVALS

Proponent have applied in EPA, Punjab and NOCs from other department will be obtained later.

4 DESCRIPTION OF THE ENVIRONMENT

This section covenants with the prevailing environmental conditions of the project area. Information that has been collected from different sources, including public literature, reports of other studies conducted in this area, knowledge with the proponent and the concerned government departments and the first-hand surveys and field measurements has been presented in this section. This encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values.

4.1 PROJECT AREA

PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB) will be constructed on 1 Acre of land located at 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore The proposed project site is cleared land, therefore, no tree cutting is involved. Land is owned by the proponent.

4.2 PHYSICAL RESOURCES

4.2.1 Topography, Geology and Soil

Lahore is generally flat and slopes towards south and south-west at an average gradient of 1:3000. It can be divided into two parts i.e. the low lying area along River Ravi and the comparatively upland area in the east away from Ravi. The low lands are generally inundated by the river water during monsoon floods. River Ravi flows in the west of Lahore District forming a boundary with Sheikhpura District. The original physiographic features like channels remnants and levees have been destroyed or changed by the construction of urban infrastructure. Flood plains have been confined by construction of embankments (bunds) and spurs. Sub-recent flood plain is 4 to 8 meters higher than the recent flood plain and can be identified at number of places i.e. Shalimar Garden, Moghalpura and Multan Road.

Terrain of the proposed project site is predominantly flat. Lahore district is situated at an average elevation of 210 meters above mean sea level. The alluvial subsoil's are of late Pleistocene and were formed by the flood plains of river Ravi. These consist of clay, silt and sand. The thickness of clay increases with distance from the river bed.

Lahore lies on the alluvial plain called Bari Doab. Doab is a local word for area between rivers. Bari Doab is a part of the Indo-Gigantic alluvial plain formed by the Indus River and its tributaries. It is bounded by Ravi and Chenab rivers in the northwest and west and by Sutlej River in the southeast. Northeastern boundaries of Doab lies

near the foothills of the Himalayan Ranges. The Bari Doab is covered by Quaternary alluvium which overlies semi-consolidated Tertiary rocks or Metamorphic and igneous rocks of Precambrian age. Except for a small area in the northeastern part of Doab where basement rock was encountered no information is available at present regarding the distribution of Tertiary and Precambrian rocks in the Doab.

Project site:

No freshwater body is available near site. Groundwater from depth of 70-75 ft. can be used for drinking and other purpose. Ground water quality report of area is annexed.

4.2.2 Climate

Purposed project site is located in District Lahore and has distinct seasons marked by wide variation in temperature. The coldest month is January in which the mean maximum temperature is 19.4 °C and the mean minimum temperature is 6.6 °C. June is the hottest month with the mean maximum temperature near 39.8 °C and the mean minimum temperature as 27.4 °C. Mean temperature of the region from 2010-2018 is given in Figure.

The average annual rainfall from 2010-2018 in Lahore works out to be 126.16 mm. Nearly 70% of it received in the form of high intensity showers during the monsoon (July, August, September) and the remaining in winter. The yearly variations are considerable. The average quarterly rainfall at Lahore during the last 9 years (2010-2018) is also shown in Figure.

The most humid period is in month of February with average humidity of 53.125 % and the least humid period is in the month of May with average humidity of 18.875 %. The average monthly humidity of Lahore region form last 9 years (2010-2018) recorded is 35.25 %. The average quarterly humidity of Lahore is shown in Figure.

4.2.3 Rainfall

The average annual rainfall from 2010-2018 in Lahore works out to be 126.16 mm. Nearly 70% of it received in the form of high intensity showers during the monsoon (July, August, September) and the remaining in winter. The yearly variations are considerable. The average quarterly rainfall at Lahore during the last 9 years (2010-2018) is also shown in Figure.

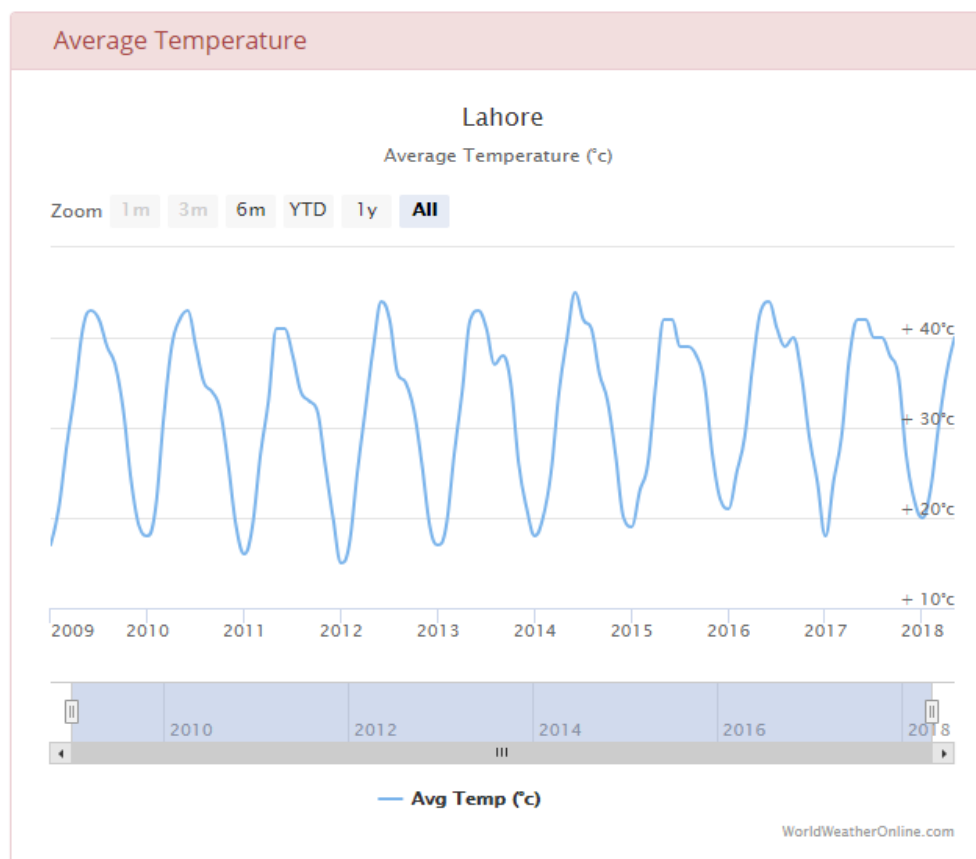


Figure 3 : Climate Graph showing Temperature and Rainfall

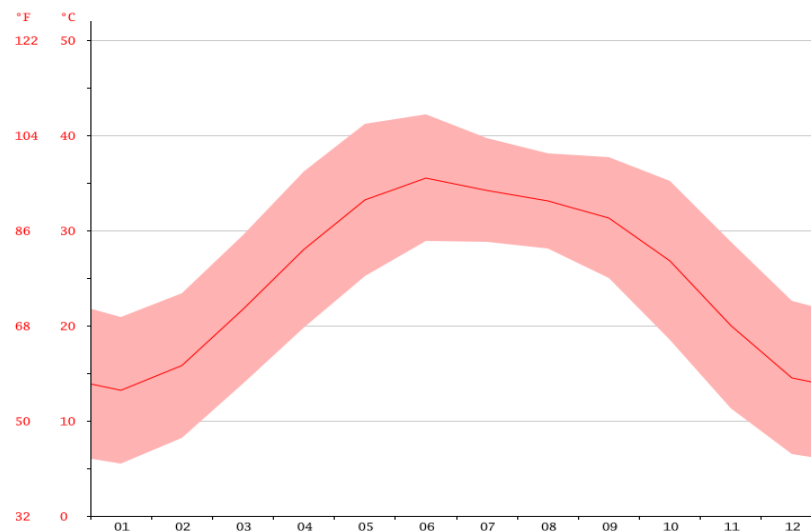


Figure 4: Average Temperature Graph

4.2.4 Seismicity

According to Seismic Zoning Map of Pakistan the proposed project area falls in Seismic Zone 2A. This map indicates zones according to the Building Code of Pakistan – 2007. Figure 6 presents the WHO Seismic Hazard Map of Pakistan clearly depicting Lahore in a category of medium intensity level.

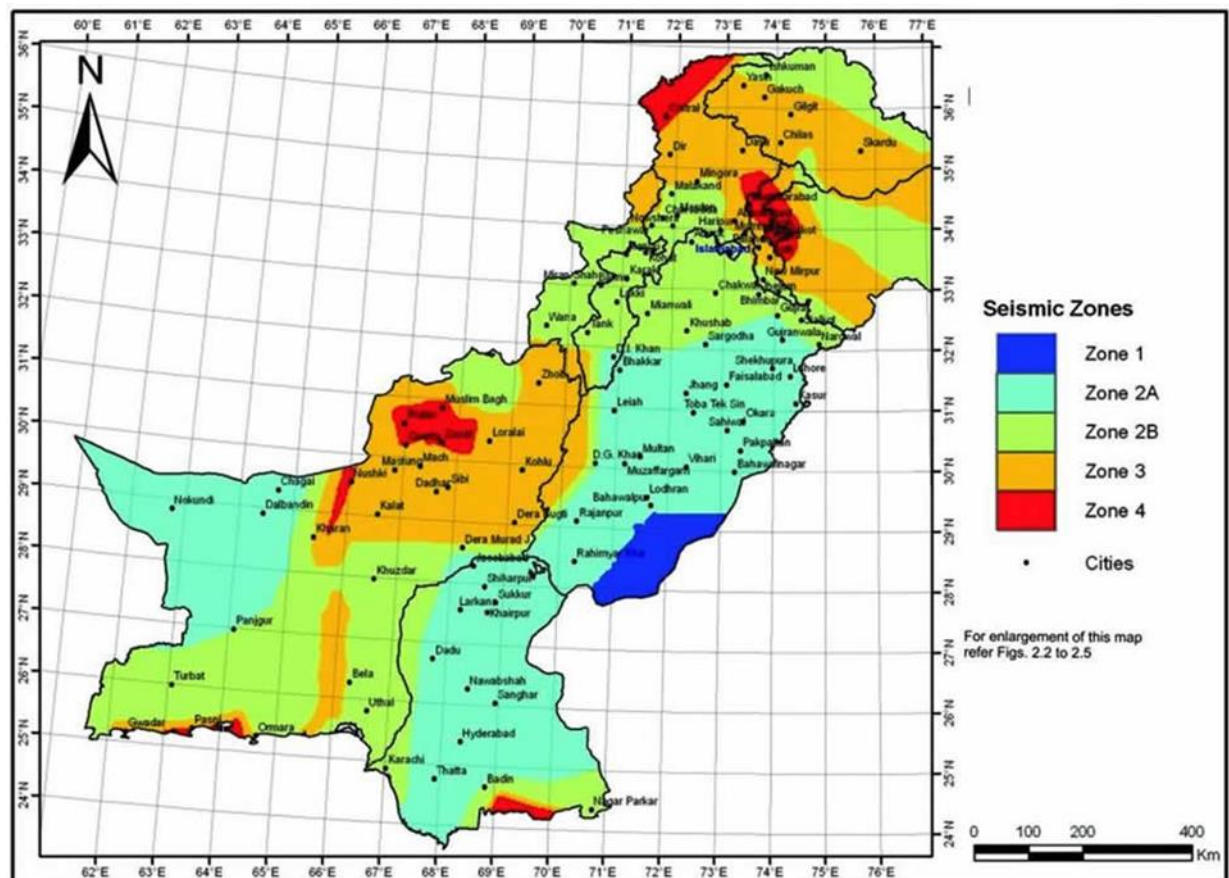


Figure 5: Seismic Zoning Map of Pakistan

4.2.5 Ground Water and Water Supply

The chemical quality of ground water in the district varies in different areas and at different depths. The strata near the project site are water bearing and alluvial deposits, giving groundwater potential throughout the project area and the water table is about 550 ft below the surface. There is no surface water body present on or near the project site. Therefore, there should be no impact on these sources of water during the construction. Groundwater sample was taken from the project site and later sent to the Lab for testing. Results are given in Table 7. Lab Report is attached as Annexure-V.

4.2.6 Ambient Air Quality

Air quality in the project area appears good based on observation during the study period. There are some industrial pollution sources present in the vicinity. The other major source of air pollution is dust arising from construction and other ground or soil disturbance. Near the access roads, when vehicles pass, dust levels will increase. The nearby road is paved but dust levels are elevated when vehicles pass intermittently over

the roads based on field observations and may be high enough to obscure vision significantly based on observations.

4.2.7 Noise

Noise from vehicles and other powered mechanical equipment is intermittent. There are also occasional calls to prayer from the local mosques but there are no significant disturbances to the quiet urban setting. However the construction from the proposed project will use powered mechanical equipment. Subjective observations were made of background noise and also of individual vehicle pass by events.

4.3 ECOLOGICAL RESOURCES

A survey of the local biological environment was conducted which includes the study of flora and fauna of the project area. Section below explains the findings based on the social survey conducted during site visit.

4.3.1 Flora

No threatened or endangered species and medicinal plants are present in the project area. No vegetation or plants will be removed due to commencement of project. However proper tree plantation and green belts are planned by the proponent. Greenery and trees are present in surroundings of site too.

4.3.2 Fauna

No threatened or endangered species found in the project site. No wildlife was present there. Only cats, dogs, sparrows and crows passed by temporarily. No permanent habitat of any fauna was found.

4.4 SOCIO-ECONOMIC RESOURCES (QUALITY OF LIFE VALUES)

Socioeconomic status (SES) is often measured as a combination of education, income and occupation. It is commonly conceptualized as the social standing or class of an individual or group. SES is a key factor that influences quality of life for children, youth and families.

Detailed survey was conducted to identify the socioeconomic status for analyzing quality of life of the respondents of the area. The results are evaluated on the basis of education, income and occupation, which are discussed below:

4.4.1 Literacy Rate/Education

According to the data collected with the help of a questionnaire, education level of the people living there was as follows:

As regard to the level of Educational attainment 15% respondents were having informal education (1-4 years). Another 18% and 20% of respondent were up to primary and middle level, respectively. However, 25% of respondents were matric, while remaining 15% of respondents were had education upto intermediate and 7% were B.A and above.

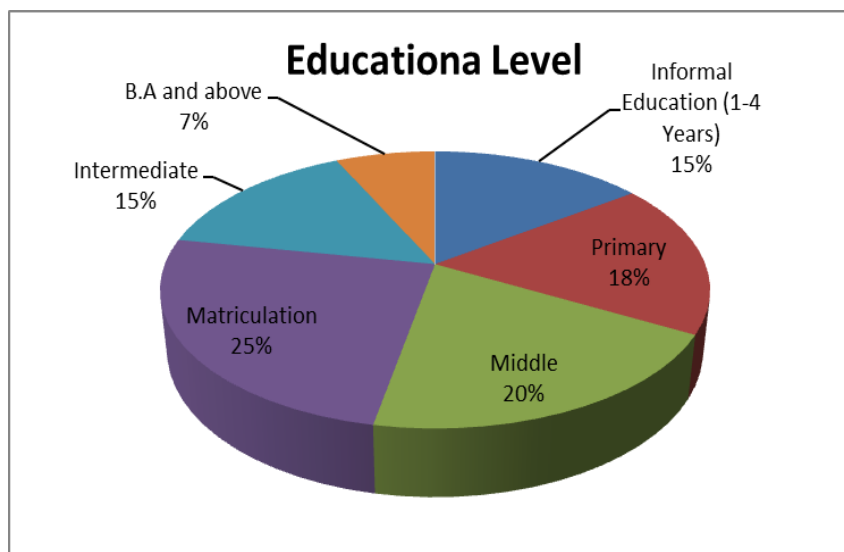


Figure 6: Graph showing Literacy Rate of the Area

4.4.2 Income

It is to notify that people living in the vicinity mostly belong to a middle class. Most of the people own small shops and work privately. Monthly income of the residents living in the proposed project area is given in Figure 8.

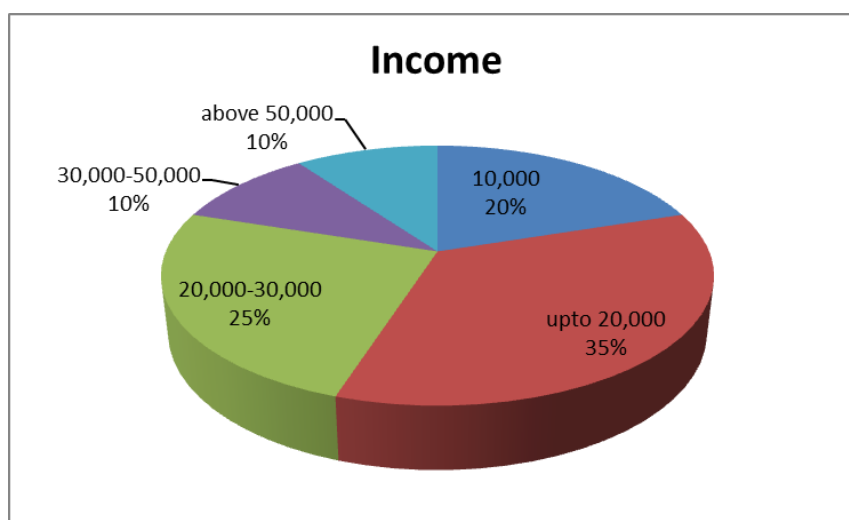


Figure 7: Graph showing Average Income

4.4.3 Occupation

Majority of the people belong to medium socio-economic level. They are mostly working privately while some had government jobs but the percentage was very low.

Mostly people in the area are shops owners, drivers etc. Percentage of the locals having different occupations is given in graph below.

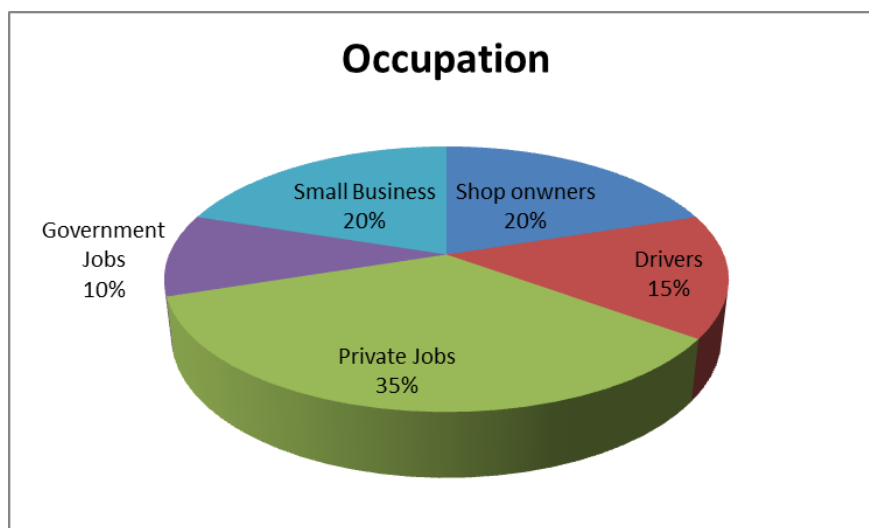


Figure 8: Occupation of the Locals

4.4.4 Economic Development

4.4.4.1 Agriculture and Industries

Cropping Pattern

The main crops in the area during winter are wheat, gram, barley, oil seeds, Taramira, Sarson and Toria. In summer sugarcane, Jawar, Bajra and rice are grown.

Horticulture

The main fruits grown in the area are orange and mango.

Industry

There are few industries present near the project site.

4.4.4.2 Transportation

Lahore is linked with the rest of the country by rail and roads. It lies on the National Highway, which connects Karachi with rest of the country. The district headquarters Lahore is connected with motorways roads to its entire subsidiary headquarters. The eastern and south-eastern belt of the district is comparatively developed with good road transportation. All major villages are connected with the district headquarters through metaled roads.

4.4.4.3 Energy Sources

The electricity will be provided by the LESCO.

4.4.5 Social and Cultural Resources

4.4.5.1 Demographic Profile

According to Punjab Development Statistics 2013, total population of district Lahore is 11.13 million estimated in 2017.

4.4.5.2 Languages

Punjabi is the predominant languages spoken in the district.

4.4.5.3 Dress

Majority of the people wear Qamiz and Shalwar. English dress; shirt and trousers are also.

4.4.5.4 Religious, Archaeological and Historical Sites

There are no officially protected heritage sites or historic, religious or archaeologically important sites located in the project work area. There are no major historic or archaeological features of note but there are a few places of worship within about 500 m of the works.

4.5 STAKEHOLDER CONSULTATION

Stakeholder's consultancy refers to a process through which the public/stakeholders can influence decisions and share control over development proposals which may affect them. In a participation exercise, the shared analysis, agenda setting and decision making are normally reached through consensus on the main issues between the public and the proponent.

The Punjab Protection Act 1997 (Amended 2012) makes the participation of the local communities mandatory in the planning and design of a development project. United Nations Conference on Environment and Development (UNCED) in 1992 endorsed the

process of stakeholders' participation and consultation as one of the key documents of the Conference-Agenda 21. It is obligatory not only to satisfy the legal requirements of the EIA process in Pakistan but also to improve and enhance the social and environmental design of the Project.

4.5.1 Objectives of Stakeholder Consultation

The aims and objectives of public involvement and consultation of this project include:

- To provide information related to proposed Project activities to stakeholders.
- Allowing the public to express their views on the scope and content of EIA (and the proposed development action).

- Obtaining local and traditional knowledge (corrective and creative) before decision-making.
- To seek for the participation of all interested parties and to identify stakeholders' interests and issues.
- Ensuring that important impacts are not overlooked.
- Reducing conflict through the early identification of contentious issues.
- Influencing project design in a positive manner.

4.5.2 Consultation Process

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the proposed project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation.

Secondary stakeholder consultations were more formal as they involved government representatives and local welfare organizations during face-to-face meetings and through telephonic conversations. They were briefed on the EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with tribal leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

4.5.2.1 Stakeholders Consulted

In the consultation process for EIA, following key stakeholders were consulted:

- Local residents near the project site

4.6 STAKEHOLDER CONCERNS AND RECOMMENDATIONS

Feedbacks form is attached with the EIA report. All these have been addressed in various sections of the EIA, and the mitigation plans have been incorporated into the EMP. The summary of the various stakeholder consultations is given below.

4.6.1 Concerns of Persons Consulted

Project Approval

The consultations demonstrated that goodwill towards the project proponents indeed exists; approval for project activities by the communities was evident. The consultations were considered a good gesture and appreciated. Proposed project will help in improving the health conditions of the area so the respondents were positive about the proposed development. Proponent recognizes that benefits from the project should be distributed judiciously and equitably especially among primary stakeholders in the project area, and will continue to ensure that this principle is followed in its projects and community development program.

Resettlement/ Relocation

The proposed site is located within the **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)** and the land is owned by proponent. No human population resides within project area. No structure of any significance (cultural, religious, archaeological, recreational or any other) stands on the land selected for the project. No flora or fauna; especially belonging to endangered species is found within a safe distance from the site which is to be removed or moved to some other part. Hence, no relocation and resettlement is required.

Local Employment

Respondents emphasized that local labor should be given priority when employing people for various project-related works and activities according to their skills.

Project Response

Respondents were in favor of the proposed project as it will provide basic health facilities to the nearby community and also raise the employment opportunities for the skilled and unskilled labor. 98% favored the construction of the project keeping in view its importance.

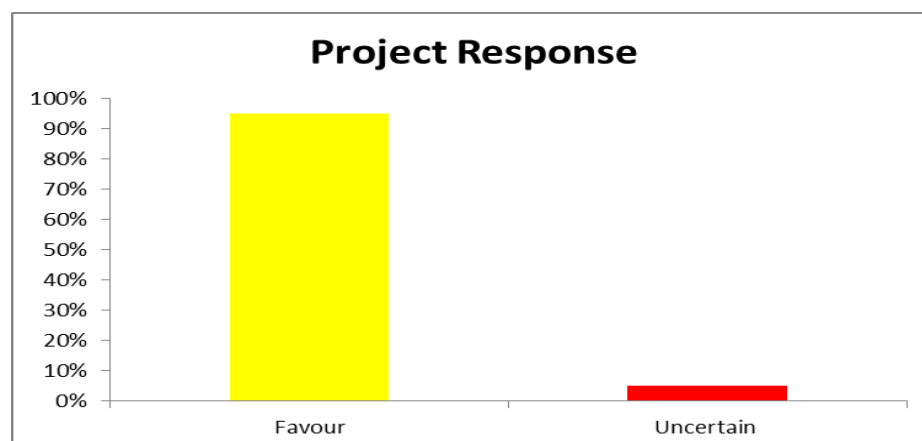


Figure 9: Response of People Consulted for the Proposed Project



Figure 10: Public Consultation

5 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 INTRODUCTION

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. Since the proposed is a construction project spread over 1 Acre, comprising of a hospital complex with ultra-modern technology, the potential impacts from the project area are identified and assessed based on the type and scale of the various activities associated with this project. Several aspects and potential impacts were identified for each phase (Project Location, Construction and Operation) of the development, with impacts evaluated in terms of their nature, occurrence, possibility and severity potential.

5.2 SCREENING OF POTENTIAL IMPACTS

Several impacts are likely as a result of the construction and operation of the project. Such impacts may be direct, indirect or ultimate (Figure 16). For the purposes of this EIA, these potential impacts (whether direct, indirect or ultimate), are assessed based on their magnitude (short-term or long-term) and effect (positive or negative). Impacts are also classified in three groups: impacts due to project location, impacts as a result of project construction and impacts as a result of project operation. Impact Assessment checklist for the proposed project during construction and operational phases is given in Table 10 and Table 11.

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

Air Environment

- Impact on ambient air quality

Noise Environment

- Impact on ambient noise

Water Environment

- Impacts on surface and ground water quality

Land Environment

- Impacts on land use

Ecological Impacts

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

Socio-Economic Impacts

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

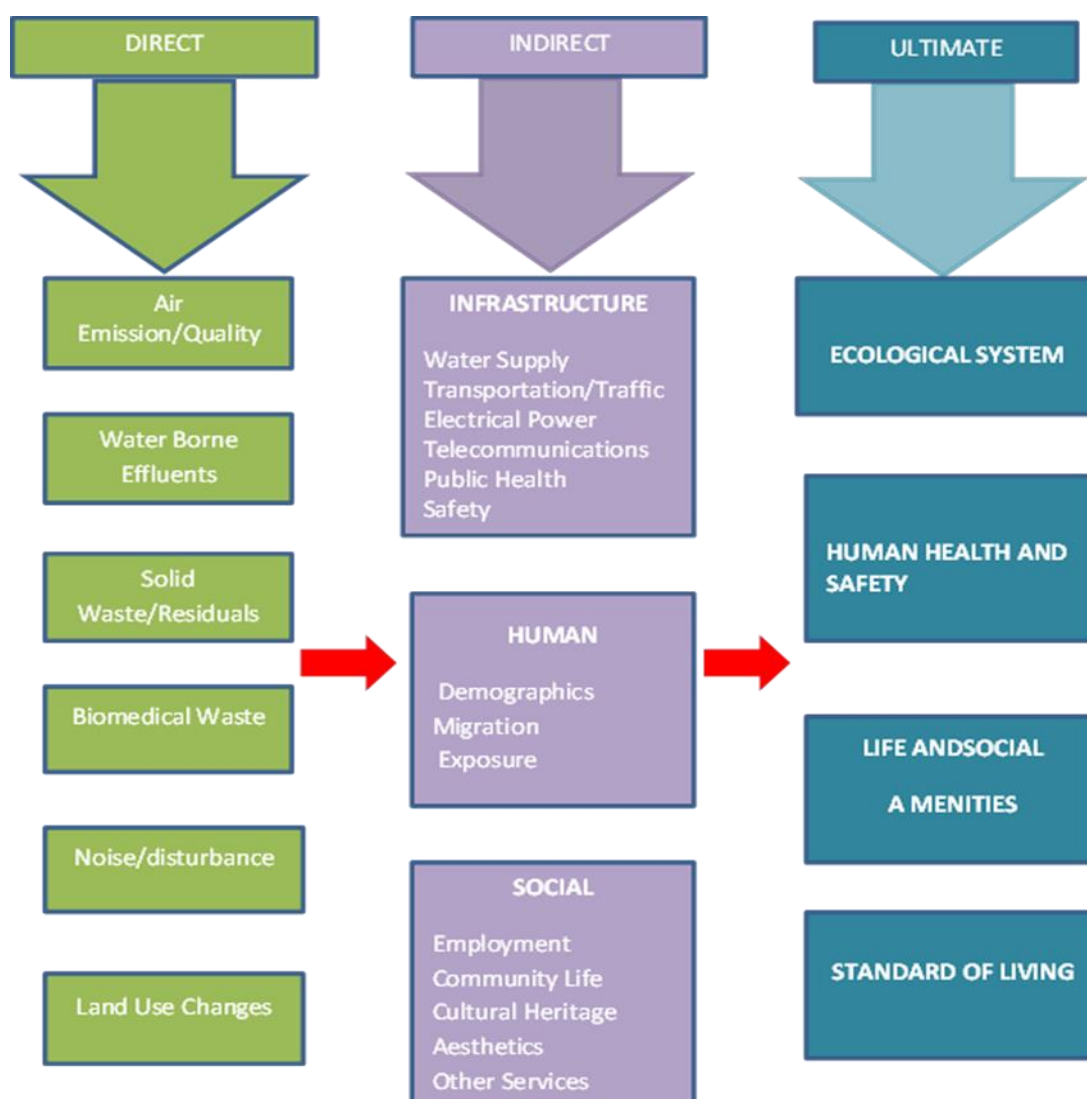


Figure 11: Screening of Potential Impacts

Table 4: Impact Assessment (Construction Phase)

ENVIRONMENTAL STANDARDS						ECOLOGICAL IMPROTANCE		SOCIAL IMPORTANCE			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-1	-1	-1	-1	0	-1	-2	-2	-1	-1	+1	+1

Table 5: Impact Assessment (Operational Phase)

ENVIRONMENTAL STANDARDS						ECOLOGICAL IMPROTANCE		SOCIAL IMPORTANCE			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-3	-1	-1	-3	0	-1	-2	-2	-1	-1	+2	+1

Key : 1 = Minor Impacts are defined as Less significant adverse impacts that may be easily prevented or mitigated

2 = Moderate Impacts are considered as likely to have adverse environmental impacts

3 = Major Impacts are defined as significant, or irreversible adverse impact

0 = This category serves no impacts from project

5.3 IMPACTS DUE TO PROJECT LOCATION

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

5.3.1 Relocation of People

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

5.3.2 Loss of Vegetation

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

5.3.3 Shifting of Utilities

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

5.3.4 Impact on Archaeological/Cultural Property

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

5.4 IMPACTS DUE TO PROJECT DESIGN

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

Mitigation Measures

- The design process should be carried out in recognition of identified hazards and risks assessment. Accepted design solutions should focus on maximum possible opportunity for risks reduction.
- Carry out engineering surveys including environmental surveys depending on the level of complexity and potential hazards of the planned facilities in the area of construction.
- The proponent intends to construct the building on modern lines, meeting national standards, with incorporation of latest technology. The design, if maintained and operated in sustainable manner, is expected to cast positive impact on the environment.

- Integrate within the existing environmental infrastructure at site to facilitate sharing of services and amenities (e.g. power, water, solid refuse collection and roads), safety arrangements and waste management systems among others. This has already been catered as per the designs annexed.
- Minimize risks to health and impacts to external environment. Suitable anti-pollution facilities (solid waste containment and organized removals, waste water purification) should be part of the design.

5.5 IMPACTS DUE TO PROJECT CONSTRUCTION

Project constructions typically change the natural environment, creating negative impacts in some cases. These are short-term impacts of low magnitude, which are easily managed.

5.5.1 Contamination of Soil and Water Quality Degradation

If not properly disposed of, the spillage of oil from the machinery, cement residue from concrete mixer plants, sewage and solid wastes, might contaminate the soil.

No impact is expected on potable water, since this will be directly supplied. Surface or ground water however, may be impacted as follows:

- Chemical contamination from construction materials such as cement, paint and mechanical fluids
- Increased siltation caused by surface runoff (as a result of the removal of vegetation and the placement of raw materials e.g. sand)

Mitigation measures

- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on site should be covered with tarpaulin or similar fabric during rainy season.
- Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- All machinery and equipment be regularly maintained and serviced to avoid leak oils.
- Maintenance and servicing of vehicle, machinery and equipment must be carried out in a designated area and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm water from carrying away oils into the soil or water systems. Waste water/wash water from these areas should be properly disposed.
- Areas dedicated for hazardous material storage shall provide spill containment and facilitate clean up through measures such as dedicated spill response equipment.

5.5.2 Impact on Air Quality

Potential impact on the air quality during the construction stage will be due to the fugitive dust and the exhaust gases generated in and around the construction site. Although gaseous air pollution was not detected, the baseline reveal that on windy days, nuisance level fugitive dusting occurs. Dust is a major component of air pollution, generated mainly from the following construction activities:

- Site clearance and use of heavy vehicles and machinery/equipment etc. at construction site
- Procurement and transport of construction materials, such as sand and cement to the construction site
- Excavated materials (soil) stockpiled

Mitigation measures

- Construction equipment will be maintained in good operating condition to reduce exhaust emissions.
- Construction site, transportation routes, diversions and materials handling sites to be water-sprayed on dry and windy days.
- Haulage trucks must be covered or the aggregates sprayed with water before loading the haulage trucks
- All diesel fuel in use should be ultra-low sulphur diesel.
- The project area will be cordoned off to minimise dust migration to nearby facilities by wind.
- Speed controls by temporary speed bumps on diversions where necessary within the construction site
- Staff working in dust generating activities e.g. site preparation, excavation, concrete mixing, stone dressing should be provided with personal protective equipment (PPE) the use of PPE shall be enforced.
- Avoiding open burning of solid wastes.

5.5.3 Soil Erosion

Ground surface alterations during the project site preparation and the transportation of construction materials and equipment, using heavy trucks will disturb the soil surface, making it highly susceptible to soil erosion occurrence. The disturbed soil could easily be transported by surface runoff, causing clogging of nearby drains and sewer pipes. This is likely to be temporary impacts, ceasing after the project construction stage is completed.

It is anticipated that the proposed project will not have a significant soil erosion impact if preventive measures are undertaken during the project design and construction stages.

Mitigation Measures

- The soil erosion problem will be addressed during the project design and construction stages when the necessary control measures would be considered and incorporated in the project design and implementation.
- The soil on site will be investigated prior to site preparation for building construction and appropriate safety procedures developed to reduce the occurrence of increased soil erosion.
- Measures taken to control erosion will include clearing and grading the ground surface within approved work limits, stripping the top soil layer from the subsoil, stockpiling the removed soil in approved areas to be retrieved during landscaping and site restoration.
- Replanting the original vegetation after construction is completed.

5.5.4 Noise Pollution

Noise is perceived as one of the most undesirable consequences of construction activity. Though the level of discomfort caused by noise is subjective, the most commonly reported impacts of increased noise levels are interference in oral communication, and disturbance in sleep. Noise levels in the vicinity of the site were found to be above normal limits for residential areas. Due to the various construction activities, there will be short-term noise impacts in the immediate vicinity of the project corridor, which may exceed acceptable limits and reach nuisance levels for residents. These include:

- Concreting and mixing
- Excavation for foundations with driller (if used)
- Construction plant and heavy vehicle movement (e.g. cranes)

Since the project site is surrounded by open areas, no major adverse impacts are envisaged in the project area. Also, the noise levels are not expected to exceed occupational limits; therefore no adverse effects on employees should result.

Mitigation Measures

- Reduce equipment noise at source by proper design, maintenance and repair of Construction machinery and equipment
- Minimize noise from vehicles and power generators by use of proper silencers and mufflers
- Use noise-abating devices wherever needed and practicable.
- The movement of vehicle should be restricted during night time.
- Providing workers with noise related PPE's
- Planting of trees that could serve as sound buffers.
- Noise barriers must be put in on and around the project boundary
- Hauling trucks shall be operated at low speed to minimize vibration, promote road safety, etc.

5.5.5 Traffic Congestion

The proposed site is located in a residential scheme and as such will see traffic volumes highest in the morning when residents are on their way to work, and in the evenings on their return. There is expected be a short-term negative impact on traffic, especially if construction materials are being delivered during peak times. The transportation of construction material from source to site will entail the use of slow moving heavy trucks, which have the potential to contribute to traffic build-up.

Mitigation Measures

- Construction activities that might substantially disrupt traffic e.g. delivery of materials should not be performed during peak travel periods to the maximum extent practicable.
- Warning signs should be used as appropriate to provide notice of road hazards and other pertinent information to motorists and the general public.
- Signage and barricades should be used as part of the typical construction traffic controls.
- Temporary manual traffic control should be used when construction occurs at the site entrance.

5.5.6 Solid Waste

Construction activities will lead to the generation of solid waste in significant amounts, mainly in the form of construction debris. Solid waste will be generated at the site during

site preparation and construction phases. The waste may consist of excavated materials, paper/cement bags, empty paint and solvent containers, broken glass among others.

Unfit disposal of construction waste or spoil could have medium or long-term environmental and public health impact. Extent of this impact will be local to areas where waste is dumped or their immediate neighborhoods.

Mitigation Measures

- Waste, including excavated soil and debris should be properly disposed of by backfilling and landscaping.
- Construction waste should be recycled or reused to ensure that materials that would otherwise be disposed of as waste are diverted for productive uses. In this regard, the proponent/contractor should be committed to ensure construction materials left over at the end of construction will be used in other projects rather than being disposed of. Some of the waste can be sold or recycled/reused by construction companies.
- Contracted waste handlers should be licensed to transport and dispose waste at approved dumpsites only.
- During transportation of waste, it should be covered to avert dispersion along the way.
- Hazardous waste will not be mixed with other solid waste generated and should be managed by way of land-filling.

5.5.7 Ecological Impact

The proposed project site has a very limited value as wildlife habitat because of lack of vegetation cover. The area around the proposed site has been developed for some time and is frequently disturbed by human activity. There are no threatened or endangered biodiversity (flora and fauna) species and protected areas known to exist within the proposed project site. For these reasons it is expected that any activities for vegetation removal, ground excavations and leveling are likely to cause minimal or no biodiversity impacts in the proposed project site.

Mitigation Measures

- Measures taken to control loss of biodiversity will include:

- Strict instructions will be given to all personnel working in project area to refrain from killing, capturing or disturbing any species of bird, reptile or mammal encountered during project activities, except in self-defense.
- No removal of vegetation will be done at the project site.
- Appropriate mitigation measures will be introduced to minimize contamination of soil and ground water.
- Replanting the original vegetation after construction is completed.
- The soil removed from the building site will be used in landscaping around the paved areas for enhancement of environmental quality.
- The surrounding areas will be replanted with grass and flowers, and other suitable plants, and the hospital administration staff will be asked to monitor the recovery of the planted natural vegetation.

5.5.8 Social Impacts

Positive Social Impact:

There will be a long-term, positive impact on the social landscape of the project area. Social impacts could result from an influx of migrant workers and associated induced development. This will ensure a rise in the consumption of consumer goods in the local area, which will further affect the wider economy. As far as possible, local labour within the project influence area will be utilized for construction purposes.

Negative Social Impact:

- Safety and Health Risks
 - The generation of solid waste, sewage, fugitive dust and gaseous emissions can impact on public health and safety, if not properly managed.
 - Construction activities have potential to pose occupational risks, some of which could be life-threatening, for example, fatal falls if workers do not use safety harness when working at heights. In addition, falling debris could injure workers if personal protective equipment (PPE) are not provided or properly used. Back injury could occur if workers lift heavy objects using inappropriate body posture. Other potential hazards might be; driving equipment with improper brake system, lack of concentration while working and exposure to hazardous wastes such as paints, cement, adhesives and cleaning solvents. This impact is expected to be short term.

Mitigation Measures

- Regular drills shall constantly follow on various possible incidences. This will test the response of the stakeholders. Such drills will keep workers alert and ensure response mechanism in the case of incidences are improved.
- Use signage to warn staff and/ or visitors that are not involved in construction activities.
- Restrict non-essential staff from the construction sites.
- Strict instructions shall be given for drivers of heavy equipment.
- Supervision of works shall be done regularly to ensure that safety conditions are met while any deviation from safety regulations is immediately reclaimed following the best practices regarding safety at work
- Develop evacuation procedures to handle emergency situations.
- Truck drivers should maintain a speed limit of not more than 20Km/hr.
- Speed controls by temporary speed bumps where necessary within the construction site.
- Clear marking of work site hazards and training in recognition of hazard symbols.
- Training of all personnel in fire prevention and protection.
- Regular inspection, testing and maintenance of equipment and machinery.
- Provide full first aid kits at the construction yard.
- Use of water sprays to arrest dust.
- Containment of hazardous materials.
- Provide adequate protective gear to construction workers.

5.6 IMPACTS DUE TO PROJECT OPERATION

During the operation phase, there will be impacts on the air, water and land environment, as well as on socio-economic aspects. The following sub-sections present the impacts due to the operation of the proposed project

5.6.1 Biomedical Waste

Biomedical waste is any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining to the production or testing of biological material or substance.

Following wastes should be classified as infectious waste:

- sharps (needles, scalpels, etc.)

- laboratory cultures and stocks
- blood and blood products
- pathological wastes; including tissues, organs and other body parts and fluids that are removed during surgery or autopsy, or their medical procedures, and specimens of body fluids and their containers.
- wastes generated from patients in isolation because they are known to have an infectious disease
- chemicals and other hazardous materials used in patient diagnosis and treatment

The unsafe disposal of healthcare waste poses serious public health risks. Contaminated needles and syringes represent a particular threat, as the failure to dispose of them safely may lead to dangerous recycling and repackaging, which lead to unsafe reuse. Contaminated injection equipment may be scavenged from waste areas and dumpsites and either be reused or sold to be used again.

Mitigation Measures

- Biomedical waste is the most critical aspect of any hospital project and as such, a Biomedical Waste Management Plan will be enforced to minimize the adverse impacts on the human, land and water environment.
- The proper procedures for handling hazardous medical waste will include identifying, labeling, keeping data sheets, knowing the exact location, proper storage, and using recommended safe work practices for handling hazardous medical waste material.
- The waste material should be stored safely before it is disposed of in a safe manner to prevent potential harm to the urban residents.
- Waste that is deemed potentially infectious may be treated prior to disposal by a number of different technologies that either disinfect or sterilize them. These technologies include steam sterilization (autoclaving), dry heat thermal treatment, chemical disinfection processes, among others.
- Incineration is the only method providing complete destruction and neutralization of the medical waste.
- Biomedical waste generated by the proposed hospital shall be disposed of by contracted vendors to the designated incinerator plant.

5.6.2 Solid Waste

It is expected that along with biomedical waste, certain quantum of solid waste, domestic in nature will also be generated during the operation stage. Such waste will be collected separately once a day, and disposed of in a suitable manner; hence no major impact is expected.

Mitigation Measures

- For the collection of such waste, receptacles will be provided at each ward and arrangements made, to prevent contact with biomedical waste.
- Waste from such containers shall be collected separately on a daily basis.
- All the collection bins shall be properly maintained on regular bases.

5.6.3 Air Environment

Pollution of the air environment may be caused by:

- Generator emission: NO_x and SO_x will be generated. The level of Sulphur Oxides (SO_x) depends on the percentage sulphur in the oil being used in the generator.
- Vehicular emissions: Carbon Monoxide (CO) is the major pollutant emitted by motor vehicle exhaust systems. This is highest when vehicles are poorly maintained, causing incomplete combustion to take place.

Mitigation Measures

- Proper maintenance and tuning of vehicles will be ensured to reduce emissions.
- Internal roads will be maintained properly to reduce fugitive dust and for the smooth movement of vehicles.
- Adequate greenbelt will be developed and maintained.
- High quality fuel having low sulphur contents will be used.

5.6.4 Waste Water Environment

Wastewater from health-care establishments is of a similar quality to urban wastewater, but may also contain various potentially hazardous components, discussed in the following paragraphs. Contaminated wastewater may result from discharges from medical wards and operating theaters (e.g. body fluids and excreta, anatomical waste), laboratories (e.g. microbiological cultures, stocks of infectious agents), pharmaceutical and chemical stores; cleaning activities (e.g. waste storage rooms), and x-ray development facilities. Wastewater may also result from treatment disposal technologies and techniques, including autoclaving, microwave irradiation and chemical disinfection.

Handling of bio-medical waste water is generally an overwhelming challenge for the health sector in general. However, within the broader theme of bio-medical waste, liquid bio-medical waste is particularly difficult to handle if there is no suitable facility engineering design, training and management guide. Contaminated waste water poses infection threat to medical staff due to its susceptibility to spilling and splashing. If left untreated it poses a health hazard to everybody.

Mitigation Measures

- Provide a separate holding tank and drainage system leading to the sewer line for process waste water.
- Pathological waste must be treated with chemical disinfectants, neutralized and then flushed into the sewage system.
- Chemical waste should first be neutralized with appropriate reagents and then flushed into the sewer system.
- The treated effluent being discharged to the sewer line should conform to the limits as provided for under PEQS Standards for effluent discharge
- Sewage from health care facilities should never be used for agricultural, aquacultural, drinking water, or recreational purposes.
- Additionally, waste segregation measures shall be employed to minimize entry of solid waste into the waste water stream, including procedures and mechanisms for separate collection of urine, faeces, blood, and vomit from patients treated with genotoxic drugs to avoid their entry into the wastewater stream.
- Regular monitoring of pre-treated contaminated process water shall be done quarterly by subjective a sample to accredited laboratory analysis.
- No chemicals or pharmaceuticals should be discharged into the septic before undergoing neutralization.
- Patients with enteric diseases should be isolated to wards where their excreta can be collected in buckets for chemical disinfection. This is of utmost importance in cases of cholera outbreaks.

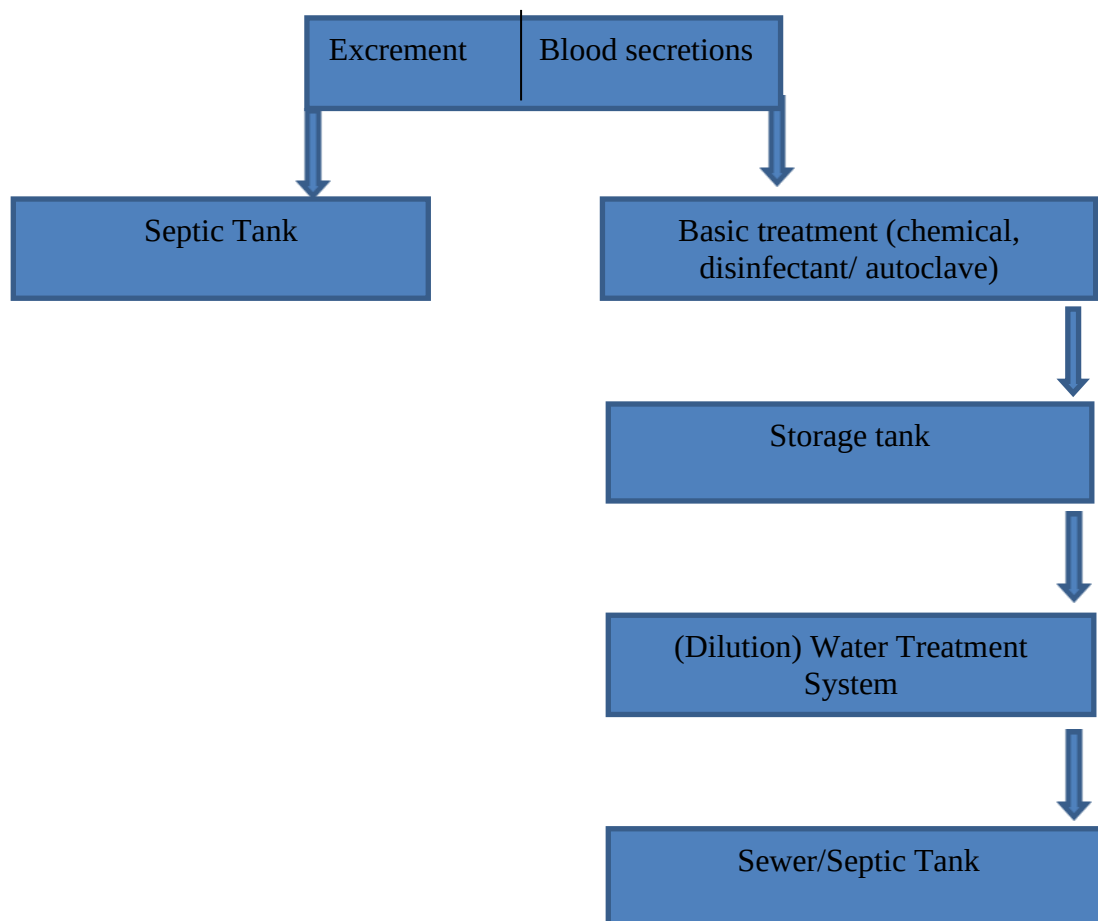


Figure 12: Diagrammatic presentation of recommended liquid bi-medical wastewater treatment system

5.6.5 Social Impacts

Provision of high quality and reliable health care services

The upcoming development will positively impact the health of nearby community through ease of access to specialized services for almost all health conditions. It will help to enhance access to diagnostic services for specialized services and improve capacity to serve many people.

Employment opportunities

Operation of the health care facility will create additional long-term technical and non-technical job opportunities for medical professionals and other non-medical professionals. Wherever possible, local qualified people will be considered for job opportunities. Adequate occupational health and safety standards should be provided to ensure the work environment is conducive.

6 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

An EIA report contains predictions about the environmental impacts of proposals and recommendations for their mitigation and management. The report is essentially a discretionary planning document. This section provides an overall approach for managing and monitoring environment and social issues and describes the institutional framework and resource allocations to implement the Environmental Management Plan (EMP) for the proposed project.

An environmental management plan (EMP), also referred to as an impact management plan, is usually prepared as part of EIA reporting. It translates recommended mitigation and monitoring measures into specific actions that will be carried out by the proponent. Depending upon particular requirements, the plan may be included in, or appended to, EIA report or may be a separate document. The EMP will need to be adjusted to the terms and conditions specified in any project approval. It will then form the basis for impact management during project construction and operation.

6.1 COMPONENTS OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The main components of an EMP are described in the table below, which reflects practice at the World Bank. Although there is no standard format, the EMP should contain the following.

Components of EMP

Components of an Environmental Management Plan (EMP)	
Summary of impacts	The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized.
Description of mitigation measures	Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under which it is required (for example, continuously or in the event of contingencies). These should be accompanied by, or referenced to, project design and operating procedures which elaborate on the technical aspects of implementing the various measures.

Description of monitoring programme	The monitoring program should clearly indicate the links between impacts identified in the EIA report and their monitoring parameters to be measure where appropriate.
Institutional arrangements	Responsibilities for mitigation and monitoring should be clearly defined, including arrangements for co-ordination between the various actors responsible for mitigation.
Implementation schedule	The timing, frequency and duration of mitigation measure should be specified in an implementation schedule, showing links with overall project implementation.
Cost estimates (Environmental budget)	These should be specified for both the initial investment and recurring expenses for implementing all measures contained in the EMP, integrated into the total project costs.

6.2 INSTITUTIONAL CAPACITY

Implementation of EMP is the responsibility of proponent and contractor. This section provides institutional arrangements for environmental management during the proposed activity and defines the roles and responsibility of the various Organizations/departments. The responsibilities of different organizations/departments are summarized below:

6.2.1 Proponent

Responsibility of Proponent includes the following:

- Must take ownership of the process to ensure that its responsibilities are met.
- Supervising construction works.
- Schedule preparation and resource forecasting for engineering and other technical activities relating to the project.

6.2.2 Contractor

The contractor of construction activities will be responsible for:

- Develop and review work instructions and procedures.
- Review and improve method statements for environmental aspects prior to work starting.

- Monitor construction activities to ensure that control measures are effective and ensure compliance with the EMP.
- Coordinate with construction teams to ensure that environmental risks are identified and appropriate controls are developed.
- Coordinate environmental training for site personnel and subcontractors.
- Liaison with the project's environmental manager, and project public liaison officer.
- Ensure correct procedures are followed in the event of an environmental incident.
- Maintain training register, identify training needs and provide training where required.

6.2.3 EIA/IEE Expert

EIA/IEE Expert (Environmental Specialist) is the member of the supervising consultant's team. The responsibilities of EIA/IEE Expert include:

- Work with proponent to ensure all statutory environmental submissions under PEPA 1997 (Amended 2012) and other environmentally related legislation are thoroughly implemented.
- Work with proponent to ensure all environmental requirements and mitigation measures from the environmental assessment of the proposed project are included in the contract prequalification and bidding documents.
- Work with proponent to execute any additional EIA requirements needed due to fine tuning of the proposed project and that environmental performance targets are included in the contracts prior to project commencement.

6.3 TRAINING SCHEDULE

Proponent will be responsible for providing health and safety training, and briefing environmental requirement of the project o workers and its staff before the commencement of work. Training workshops would be conducted at every six months or twice each year to share the monitoring report on the implementation of the EMP.

Table 6: ENVIRONMENTAL MANAGEMENT PLAN

Activity (Summary of Impacts)	Mitigation Measures	Implementation Schedule (Timing/Frequency)	Institutional Capacity (Responsibility)
<u>DESIGN/PRECONSTRUCTIN STAGE</u>			
Layout and Design Preparation of design documentation for proposed construction. Procedures for approval of design documentation	- The design process should be carried out in recognition of identified hazards and risks assessment. Accepted design solutions should focus on maximum possible opportunity for risks reduction. - Carry out engineering surveys including environmental surveys depending on the level of complexity and potential hazards of the planned facilities in the area of planned construction.	During preliminary surveys and investigations	Proponent/ Environmental Specialist/ Contractor

Access to Site Sound environmental principles must be followed whilst establishing access to the site	• The detailed engineering and equipment specifications must conform to acceptable national and international standards. • Include enhancements, techniques to reduce impacts. • The location of all access points to the proposed project site must be identified and confirmed. • Marking of survey points must be done with the Proponent's approval.	Prior to moving onto site During surveys and preliminary investigations	Proponent/ Contractor
Training of Site Staff on General Environmental Conduct These points need to be made clear to staff on site before the project begins	• Ensure that all site personnel have a basic level of environmental awareness training. • The Contractor must submit a proposal for this training to the workers for approval. • Site policy also needs to be explained to the construction	During staff induction and ongoing	Proponent/ Contractor

Social Impacts – Visual & Noise It is important to take notice of the	workers. • No alcohol / drugs to be present on site. • No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel). • Prevent excessive noise. • Prevent unsocial behavior. • No harvesting of firewood from the site or from the adjacent areas. • Trespassing on private / commercial properties adjoining the site is forbidden. • Other than the pre-approved security staff, no workers should be permitted to live on site. • During the set up phase of the project, the Proponent and Proponent/
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needs and wishes of those living of working adjacent to the site. Failure to do so can cause disruption to work and increase costs in the form of delays	Consultant need to make contact with those people that are interested or affected by the development.	Prior to moving onto site/ On site Feedback	Contractor/ Environmental Specialist
	• Construction vehicles are to be fitted with standard silencers prior to the beginning of construction. • Equipment that is fitted with noise reduction facilities should be used as per operating instructions and maintained properly during site operations.	During surveys and preliminary investigations	
	• Storage facilities and other temporary structures on site should be located such that they have as little visual impact on local resident as possible.	and site set up	

Cultural Environment	• Prior to the commencement of construction, contractor needs to know if any possible archaeological or historical objects of value are present near the project site. • Inform the relevant department in case of any disturbance to cultural environment.	During surveys and preliminary investigations and site set up	Proponent/ Contractor
<u>CONSTRUCTION STAGE</u>			
Air Pollution/ Dust Exhaust gases from vehicles and machinery and dust during excavation, backfilling, compaction activity and movement of vehicles on un-paved roads Establishment of the camp site, and related temporary works can reduce air quality.	• Monitoring of gaseous emission should be conducted by 3rd party. • Well maintained machinery should be used at site and its regular monitoring should be ensured. • Use of water sprays to decrease dust generation. • Workers will be provided with Personal Protective Equipments	Throughout Construction Phase	Proponent/ Contractor

Water Resources	(PPEs) such as face masks and goggles. • Availability of water will be assessed to evaluate the impact on community resources. • Water should be obtained without depleting local water supplies. • Guidelines should be established to minimize the wastage of water during construction. • Protection of groundwater reserves from any source of contamination such as the construction and oily waste that will degrade its potable quality.
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Throughout Construction
Phase

Proponent/
Contractor

Wastewater	• Sanitary wastewater should be treated as per wastewater management plan. • No hazardous untreated effluents should be released to the environment. • Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric during rainy season; • Prevent the washing away of construction materials, soil, silt or debris into any drainage system; • All machinery and equipment should be regularly maintained and serviced to avoid leak oils; • Wastewater sampling should be conducted quarterly by 3rd party.
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Soil Erosion	• Avoid creating excessive slopes. • Save top soil removed during construction and use to reclaim disturb areas, as soon as it is possible to do so.	During Construction Phase	Proponent/ Contractor
Solid Waste Debris and surplus construction material	• Confirm amounts of surplus rock based materials can be reused in the project or by other interested parties for public projects.	During Construction Phase	Proponent/ Contractor
Noise Construction activities are expected to increase the noise levels mainly due to plying of construction vehicles, mechanical machinery such as cranes, hammering etc.	• All machinery should be fitted with acoustic insulation. • Providing the construction workers with suitable hearing protection like earmuffs and training them in their use.	During Construction Phase	Proponent/ Contractor
Equipment Maintenance	• Prepare and keep the record of equipment maintenance log. • Prepare proper maintenance sheets for vehicles.	During construction	Proponent/ Contractor

Workers and Public Safety	• Use fully tuned vehicles and machinery. • Safety conditions during construction phase should be ensured. • Safe access and thoroughfare must be provided on site at all times. Dangerous areas should be clearly identified with appropriate signs. • Providing every worker with skull guard or hard hat and safety shoes. • Conduct proper worker health and safety training and orientation prior to initiation of tasks.
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During construction Proponent/
Contractor

Social Impacts	• Use local labour as far as possible for manual work. • Use local educated people for clerical and office work where possible. • Contractor's activities and movement of staff to be restricted to designated construction areas. • The site must be kept clean to minimize the visual impact of the site. • Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors. • Noisy activities must be restricted to the designated time.	During Construction Phase	Proponent/ Contractor
Site Restoration	• Carry out complete restoration of the construction sites.		

	- Remove all waste, debris, unused construction material, and spoil from the worksites. - Measures taken to control erosion will include clearing and grading the ground surface within approved work limits, stripping the top soil layer from the subsoil, stockpiling the removed soil in approved areas to be retrieved during landscaping and site restoration. - Replanting the original vegetation after construction.	After completion of project	Proponent/ Contractor
<u>OPERATIONAL STAGE</u>			
Air Quality	Regular monitoring will be carried out by 3rd party to assess the nuisance of emissions from the project site.	Operational phase	Proponent

Wastewater	- Monitoring data should be kept in record for further correspondence. - Domestic wastewater and bio-medical wastewater should be treated prior to final disposal. - Bio-medical wastewater should be treated in settling tank prior to final disposal. - Chemical waste should first be neutralized with appropriate reagents and then flushed into the sewer system. - Sewage from health care facilities should never be used for agricultural, aqua-cultural, drinking water, or recreational purposes. - Monitoring of wastewater should be carried out regularly by 3rd
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Operational phase

Proponent

Solid waste	party to ensure compliance with the PEQS. • Solid waste should be disposed off through approved vendors. • Training will be provided to personnel for identification, segregation, and management of waste. • For the collection of such waste, receptacles will be provided at each ward and arrangements made, to prevent contact with biomedical waste. • Waste from such containers shall be collected separately on a daily basis. • All the collection bins shall be properly maintained on regular bases.	Operational phase	Proponent
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Biomedical Waste	• The proper procedures for handling hazardous medical waste will include identifying, labeling, keeping data sheets, knowing the exact location, proper storage, and using recommended safe work practices for handling hazardous medical waste material. • The waste material should be stored safely before it is disposed of in a safe manner to prevent potential harm to the urban residents. • Waste that is deemed potentially infectious may be treated prior to disposal by a number of different technologies that either disinfect
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Noise	or sterilize them. These technologies include steam sterilization (autoclaving), dry heat thermal treatment, chemical disinfection processes, among others. • Incineration is the only method providing complete destruction and neutralization of the medical waste. • Biomedical waste generated by the proposed hospital shall be disposed of by contracted vendors to the designated incinerator plant. • Equipment should be regularly serviced. • Ensure that the workers are wearing PPE's (ear plugs, ear muffs etc.) where engineering
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Operational phase

Proponent

Fire Hazard	control is not applicable to reduce the impact of noise - Schedule different noisy activities to occur at the same time as less frequent noise activities would be less annoying. - Install fire-fighting equipments in the entire building. - Fire exit should be made which should be considered at the design phase. - Train employees to use fire fighting equipments at the time of emergency.	Operational Phase	Proponent
Increased Water Demand	- Portable water should not be used for irrigation - Indigenous vegetation to be used for landscaping to minimize watering requirements	Operational Phase	Proponent

Increased Risk of Occupational Health and Safety Incidences	• Cleaning methods utilized for the cleaning of vehicles, floors, containers, yards etc. must aim to minimize water use. • Ensure that workers are oriented to the specific hazards of individual work assignments. • Training should generally be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards; • Conduct basic first aid, fire safety training, and Occupational Safety and Health training. • Provide adequate lighting in all patient rooms, labs, yards etc. • Passageways for pedestrians and vehicles within and outside buildings should be segregated	Operational Phase	Proponent
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Increased Traffic Volume	and should provide for easy, safe, and appropriate access. • Provision of fire fighting equipment in strategic and well labelled sites. • Materials handling operations should follow the instructions of use given by the manufacturer- The “Material Safety Data Sheets)” • Train workers on safe work practices, and provide appropriate PPE. • Enforcement of use of PPE such as gloves, lab coats, nose masks in all workrooms requiring use. • Designate vehicle registration and checkpoint inside the premise to avert unnecessary traffic snarl up along adjacent roads caused by
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	vehicles waiting to access the hospital. • There will be 2 parking areas designated in the project: basement and ground floor that will provide for 295 cars and 400
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6.4 ENVIRONMENTAL MONITORING PLAN

An environmental monitoring plan provides a delivery mechanism to address the adverse environmental impacts of a project during its execution, to enhance project benefits, and to introduce standards of good practice to be adopted for all project works. An environmental monitoring program is important as it provides useful information and helps to:

- Assist in detecting the development of any unwanted environmental situation, and thus, provides opportunities for adopting appropriate control measures, and
- Define the responsibilities of the project proponents, contractors and environmental monitors and provides means of effectively communicating environmental issues among them.
- Define monitoring mechanism and identify monitoring parameters.
- Evaluate the performance and effectiveness of mitigation measures proposed in the Environment Management Plan (EMP) and suggest improvements in management plan, if required,
- Identify training requirement at various levels.

An environmental monitoring plan is suggested to monitor environmental parameters during survey, construction and post construction phase of the project.

Following environmental record should be maintained:

- Incident record of all moderate and major spills and other incidents and accidents. The record will include:
 - ✓ Location of spill or Spilled material
 - ✓ Estimated quantity or the amount of injury
 - ✓ Nature of injury or loss (temporary or permanent)
 - ✓ Restoration measures
 - ✓ Photographs
- Description of any damage to vegetation, water resource, or community asset.
- Corrective measures taken, if any
- Waste Tracking Register that will hold records of waste generated during the construction period. This will include quantities of waste disposed, recycled, or reused.
- Records of water consumption with usage breakdown
- Survey reports, in particular, the following:

- ❖ Vehicle and equipment noise.
- ❖ Ambient noise survey reports.
- ❖ Ambient level of PM
- ❖ Vendor data—all vendors disturbed by the project and compensation paid Public infrastructure: Record of all damages and repair work undertaken.
- ❖ Employment
- ❖ Total number of unskilled, semi-skilled, and skilled jobs offered during Construction.
- ❖ Name and domicile of the employed staff.
- ❖ Project and Community Interface
- ❖ Record of community complains and the measures taken to address them.
- ❖ Number of meetings held in various communities and data of persons who attended
- ❖ Environmental and social training records.

Table 7: ENVIRONMENTAL MONITORING PLAN FOR CONSTRUCTION AND OPERATIONAL PHASE

Environmental Quality	Parameters	Details of Standards/Guidelines	Frequency	Location	Responsibility
CONSTRUCTION PHASE					
Waste Collection, Storage and Disposal	Inspection of Waste Generation, collection, Storage and Disposal at site	Construction Site	Statutory Requirements	Once a week	Environmental officer/manager
Workers safety	Injuries and accidents	Recording injuries	-	Onsite	HSE/contractor
Air Quality	Air Quality (PM ₁₀) All relevant stack emissions (CO,NO _x ,SO _x)	Active Construction Area	PEQS	Once a month	Environment Officer /manager

	Smoke)				
Water Quality	Groundwater Quality (Total Coliform, Fecal E.Coli, Total Colonial Count, pH, TDS, Total hardness, Alkalinity Nitrates, Chloride, Sodium, iron)	Groundwater sources near the project site	PEQS	Once a month	Environment Officer /manager
Noise Level	Noise level on dB (A) Scale	At least three locations near boundary	PEQS	At least 3 working days	Environment Officer /manager
OPERATIONAL PHASE					
Ambient Air Quality	CO, NO _x , SO _x , SPM, PM ₁₀	Operational area	PEQS	Quarterly	Environment Officer /manager

Water Quality	Groundwater and wastewater Quality (Total Coliform, Fecal E.Coli, Total Colonial Count, pH, TDS, Total hardness, Alkalinity Nitrates, Chloride, Sodium, iron)	Wastewater sample and groundwater sample	PEQS	Quarterly	Environment Officer /manager
Noise Level	Noise level on dB (A) Scale	Noise level near the receptor	PEQS	Quarterly	Environment Officer /manager
Waste disposal, procedure for waste collection, storage, and disposal	Inspection of waste generation, collection, storage, and disposal will be undertaken at each site of the project activity	Visual inspection	Statutory Requirements	Once daily	Administration Officer
Safety	Injuries	Injuries will be recorded		Daily	Administrator

6.5 EQUIPMENT MAINTENANCE DETAILS

New equipments of latest technology with high efficiency will be purchased for better working conditions. Maintenance of Equipment will be done twice year.

6.6 ENVIRONMENTAL BUDGET

Approximately 3 million PKR per year budget will be reserved for the solid waste management, fire-fighting and environmental monitoring.

7 CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the proposed project of **PUBLIC HEALTH UNIT BY ALKHIDMAT FOUNDATION PAKISTAN (CENTRAL PUNJAB)**” Located At 33-Km Main Ferozpur Road, Kot Maila Ram, Tehsil Cantt District Lahore.

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

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

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

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

7.2 RECOMMENDATIONS

The EIA study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, ear muffs, mufflers, goggles, gloves and shoes etc. should be provided to workers .
- The infection control protocols will be strictly implemented to minimize health risks for the staff and patients.
- Strictly following standard operating procedures to use sharps and proper use of personal protective equipment (PPE) particularly prick-proof gloves and masks is of foremost importance to avoid safety hazards associated with

sharps, needles and others.

- Advise workers to follow SOPs.
- Installation of fire extinguishers in the premises and their monitoring must be ensured.
- Equipment maintenance and efficiency must be checked.
- No compromise on public health and environment should be allowed.
- Risk waste and non-risk waste should be managed according to the Punjab Hospital Management Rules, 2014.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Proper tree plantation plan should also be developed in order to make the project site environment friendly.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- The proposed Environmental Management & Monitoring Plan should be implemented.

LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ALGAS	Asia Least Cost Greenhouse Gases Abatement Strategy
ASR	Air Sensitive Receivers
BDL	Below Detection Limit
BOD	Bio-chemical Oxygen Demand
CC	Construction Contractor
CDM	Clean Development Mechanism
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
DCO	District Co-ordination Officer
DD	Deputy Director
DG	Directorate General
DRR	Disaster Risk Reduction
DWQS	Drinking Water Quality Standards
EE	Environmental Engineer
EIA	Environmental Impact Assessment
EMMP Plan	Environmental Management and Monitoring
EPA	Environment Protection Agency
EPC	Engineering Procurement Construction
EPD	Environment Protection Department
EPHE	Environmental & Public Health Engineering
FGDs	Focused Group Discussion
GDP	Gross Domestic Product
gm	Gram
GoP	Government of Pakistan
IEE	Initial Environmental Examination

LGO	Local Government Ordinance
LDA	Lahore Development Authority
LDL	Lowest Detection Limit
mg/l	Milligrams per liter
MSL	Mean Sea Level
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards
NEP	National Environmental Policy
NO₂	Nitrogen Dioxide
NOC	No Objection Certificate
OH & S	Occupational Health and Safety
PAPs	Project Affected Persons
PEPA	Pakistan Environmental Protection Act
PEPC	Pakistan Environmental Protection Council
PEQS	Punjab Environmental Quality Standards
PM	Particulate Matter
SO₂	Sulfur Dioxide
SOP	Standard Operating Procedures
SWM	Solid Waste Management
TA	Technical Assistance
TORs	Terms of Reference
TSS	Total Suspended Solids
UNDP	United Nation Development Pro
WASA	Water and Sanitation Agency

GLOSSARY

Aesthetic	Concerned with beauty or appreciation of beauty.
Agency	A business or organization providing a particular service on behalf of another business, person, or group.
Aquifer	An aquifer is an underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand or silt) from which groundwater can be extracted using water well.
Climate	The weather conditions prevailing in an area in general or over a long period.
Consultant	A person who provides professional advice or services to companies for fee.
Construction Waste	Waste generated from the buildings and construction industry and includes material like bricks, concrete, tiles, debris, ceramics and more.
Convention	An agreement between states covering particular matters, especially one less formal than a treaty.
Demographic	A single vital or social statistic of a human population, as the number of births or deaths.
Ecology	The branch of biology that deals with the relations of organisms to one another and to their physical surroundings.
Endangered species	A species of animal or plant that is seriously at risk of extinction.
Environment	Relationship of natural world (human beings, animals and plants) with physical surroundings (air, land, water).
Excavation	Excavation is the act or process of digging, especially when something specific is being removed from the ground. Archaeologists use excavation to find artifacts and fossils.
Framework	A framework is a real or conceptual structure intended to serve as a support or guide for the building of something that expands the structure into something useful.
Hazardous Waste	Hazardous Waste is waste that poses substantial or potential threats to public health or environment.
Impact	The action of one object coming forcibly into contact with another.
Livelihood	A set of activities involving Securing the basic necessities –food, water, shelter and clothing of life.

Municipal Waste	Municipal Solid Waste (MSW)—more commonly known as trash or garbage—consists of everyday items we use and then throw away, such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries. This comes from our homes, schools, hospitals, and businesses.
Nature	The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.
Ordinance	An ordinance is a law enacted by a municipal body, such as a city council or county commission (sometimes called county council or county board of supervisors).
Preservation	Preservation is the strict setting aside of natural resources to prevent the use or contact by humans or by human intervention. In terms of policy making this often means setting aside areas as nature reserves (otherwise known as wildlife reserves), parks, or other conservation areas.
Proponent	A person who advocates a theory, proposal, or course of action.
Policy	A policy is a deliberate system of principles to guide decision and achieve rational outcomes.
Rehabilitation	To restore to a condition of good health, ability to work, or the like.
Resettlement	The settlement of people in a different place.
Resource	A stock or supply of money, materials, staff, and other assets that can be drawn on by a person or organization in order to function effectively.
Sanitation	Conditions relating to public health, especially the provision of clean drinking water and adequate sewage disposal.
Seismic Hazards	A seismic hazard is the probability that an earthquake will occur in a given geographic area, within a given window of time, and with ground motion intensity exceeding a given threshold.
Stakeholder	A stakeholder is a party that has an interest in a company and can either affect or be affected by the business. The primary stakeholders in a typical corporation are its investors, employees and customers.
Stage digging	Stage digging is a process by which portions of the root ball are dug over a period of time in order to allow the tree to acclimate to the stresses gradually.

Topography

Topography is the study of the shape and features of the surface of the Earth and other observable astronomical objects including planets, moons, and asteroids.

Vegetation

Plants considered collectively, especially those found in a particular area or habitat.

Valued Environmental Components

Valued environmental components (VECs) are defined as fundamental elements of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a proposed project.