TITLE OF THE PROJECT

CONSTRUCTION OF HUTS & COMMERCIAL BUILDINGS AT KHEWAT NO. 09, KHATOONI NO. 18, KHASRA NO. 593, MOUZA CHARHAN, TEHSIL MURREE, DISTRICT RAWALPINDI

Prepared by

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GLOSSARY

a. **Act:** means Punjab Environmental Protection Act, 1997 [Amendment 2012].

b. **Dust:** are fine powdery material such as dry earth/ pollen that can be blown in the air.

c. **Discharge:** means spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping

d. **Environment:** means air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned.

e. **Environmental Impact Assessment:** means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed.

f. **Effluent:** means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapour.

g. **Hazardous Substance:** a substance or mixture of substances, other than a pesticide as defined in the Agricultural Pesticides Ordinance, 1971 (II of 1971), which, by reason of its chemical activity or toxic, explosive, flammable, corrosive, radioactive or other characteristics causes, or is likely to cause, directly or in combination with other matters, an adverse environmental effect; and any substance which may be prescribed as a hazardous substance.

h. **Hazardous Waste:** means waste which is or which contains a hazardous substance or which may be prescribed as hazardous substance or which may be prescribed as hazardous waste, and includes hospital waste and nuclear waste.

i. **Industrial Activity:** means any operation or process for manufacturing, making, formulating, synthesizing, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal or for mining, for oil and gas exploration and development, or for pumping

water or sewage, or for generating, transforming or transmitting power or for any other industrial or commercial purpose.

j. **Industrial Waste:** means waste resulting from industrial activity.

k. **Incineration:** The thermal destruction of waste for the primary purpose of disposal, with or without recovery of energy.

l. Note: the term incineration generally means 'the act of burning to ashes'.

m. Initial Environmental Examination: means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of an environmental impact assessment.

n. Leachate: A liquid that has percolated through and/or been generated by decomposition of waste material. It includes water that come in contact with waste and is potentially contaminated by nutrients, metals, salts and other soluble or suspended components and products of decomposition of waste.

o. Landfill: A waste disposal site used for the controlled deposit of solid waste onto or into land.

p. Mitigation Measure: means measure for control, reduce or elimination of an adverse impact of a development on environment, including a restorative measures.

q. Punjab Environmental Quality Standards: means the permissible standards for emission of air pollutants and noise and for discharge of effluent and waste.

r. Regulations: means the Pakistan Environmental Protection Agency, Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

s. Recycling: Set of processes (including biological) for converting recovered materials that would otherwise be disposed of as waste into useful material and/or products

t. Reuse: using a waste product again for the same or different purpose without further manufacture.

u. Suspended Solids: are solid particles suspended in water or air that can be removed by filtration or settlement.

v. **Sustainability:** means such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs.

w. Waste: means any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process.

LIST OF ABBREVIATIONS

BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EA	Environmental Approval
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMtP	Environmental Monitoring Plan
EPD	Environmental Protection Department
EPO	Environmental Protection Order
IESCO	Islamabad Electric Power Company
GOP	Government of Pakistan
HW	Hazardous Waste
IEE	Initial Environmental Examination
IMC	Independent Monitoring Consultant
IPPs	Independent Power Projects
IUCN	International Union for Conservation of Nature
LAA	Land Acquisition Act
MoE	Ministry of Environment
MSW	Municipal Solid Waste
NA	Not Applicable
NCS	National Conservation Strategy
ND	Not Detected
NO	Not Objectionable
PEQS	Punjab Environment Quality Standard
NGO	Non-Government organization
NOC	No-Objection Certificate
NOx	Oxides of Nitrogen
PC	Public Consultation
PEPA	Punjab Environmental Protection Act, 1997 [Amendment, 2012]
PEPC	Punjab Environmental Protection Council
PM	Particulate Matter
PP	Project Proponent

PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
RAP	Resettlement Action Plan
RFP	Request for Reports
SOx	Oxides of Sulphur
SP	Seismic Provisions
TES	Threatened, Endangered and Special Status Species
TOC	Total Organic Carbon
UBC	Uniform Building Code
VOC	Volatile organic compound
WAPDA	Water and Power Development Authority
WHO	World Health Organization
WWTP	Waste Water Treatment Plant

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. TITLE & LOCATION OF PROJECT:

Proposed project is about construction of Commercial Building under the name of "Construction of Huts & Commercial Building" on khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi, the proposed site is located at, Charhan, Tehsil Murree, District Rawalpindi. As the Murree Tehsil is declared as Environmental Sensitive Area as per EPA Notification No. 304/56-G/LS/EPA. Therefore, Environmental Impact Assessment (EIA) is prepared for submission to EPA Punjab and to obtain NOC from EPA. Total land owned by Proponent is 17 Kanals, 16 Marlas & 6 sqft. Total number of Huts are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 & 19 in the proposed construction. The land is fully owned by proponent and Farad-e-Malqiyat & Aks-e-Shjra is obtained by proponent & attached with this report. The Buidling will be developed in phases. Currently, in first phase proposed development and construction is planned to be done on Huts no 1-11 then 12-19. Total Land area which is 17 kanal, 16 marla and 6sqft. In first phase 1-5 huts will be constructed each Hut consists of 1 ground and 2 upper floors. In next phase 6-11 huts will be constructed, each hut consists of 1 ground and 1 upper floors. In another next phase 12-19 huts will be constructed, each hut consists of 1 ground and 1 upper floors except 15, 16 & 17 which is only ground floor. The land required for the project activity is owned by the proponent and no extra land acquisition involved in this project. The proposed site is located at Khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi.

2. PROJECT PROPONENT

The project proponent is Mr. Zafar Ullah Khan s/o Haji Sher Dill Khan. Detail of contact person is described as below:

Name:	Mr. Zafar Ullah Khan s/o Haji Sher Dill Khan
Post:	Owner/proponent
Contact Details:	**Cell:** +9245-4646406; **E-mail**: sami.asconsultants@gmail.com

3. ENVIRONMENT CONSULTANTS:

In order to satisfy EPA's requirement to carry out Environmental Impact Assessment (EIA), **M/S A.E. Enterprises** is engaged by the proponent as their Environmental Consultant for this project. As per Notification No. 304/56-G/LS/EPA and **Schedule II (Clause-I, All Projects Situated In Environmentally Sensitive Zones)** of Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulation 2000**,** the proposed project falls under category of projects 'Environmental Sensitive Area' requiring Environmental Impact Assessment (EIA).

4. PROJECT PARTICULARS:

The project aims at development and construction of Commercial apartments under the name and style of **Construction of Huts & Commercial Building on Khewat No 09, Khatooni No 18, Khasra No 593, Charhan, Tehsil Murree, District Rawalpindi.** The proposed construction land 17 kanals, 16 marlas & 6 sqft will be developed. The land required for the proposed project is fully owned by proponent and no land acquisition is involved in the said project. Estimated cost of the proposed project is ~ Rs. 01 billion including the cost of land and development of building infrastructure.

It is a purely residential construction plan comprising of model apartments/huts along with a number of facilities for its residents. This construction will be unique in its nature as it will play an important role in boosting and introducing the improved living standard for the residents. The current project will provide employment opportunities, directly and indirectly to a local people of different categories, both skilled and unskilled, during its construction and regular occupancy.

The impacts of the project activities on environment during construction and operation phases have been considered in this EIA report.

The mitigation measures have been proposed to minimize / eliminate the adverse/negative impacts of the project on the environment. A complete Environmental Monitoring and Environment Management Plan are recommended to regulate the requirements of Punjab Environmental Protection Act, 1997 (Amendment, 2012) and Schedule-II (Section-I) (Environmental Sensitive Area) of Review of IEE/ EIA Regulations, 2000.

Annual environmental monitoring, by a third party will also ensure environmentally sound operation of the project. The proponent / contractor will hire trained staff to ensure the enforcement of Environmental Management Plan. The equipment will be kept in proper condition to save the environment from any damage. During construction phase; air quality, ground water quality and surface water quality will be monitored and in operational phase; air quality and wastewater quality will be monitored.

5. ENVIRONMENTAL ASSESSMENT:

The impacts of the project activities on environment during construction & operational phases of proposed project have been considered. The mitigation measures have been proposed to minimize / eliminate the negative impacts of the project on the environment. A complete Environmental Monitoring and Environment Management Plan has been recommended to regulate the requirements of Punjab Environmental Protection Act, 1997

[Amendment, 2012]. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project.

The impacts on environment which are likely to be generated during execution of construction phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
Planning and designing of apartments	Cutting of trees Involvement of forest and shamlati land Stability issues of building	No tree will be cut down during construction of said apartment No forest and shamlati land will be included and to ascertain this NEC Farad is available with the proponent. The apartment buildings are designed by certified engineers / architects based on the reliable data and ground acceleration of Murree area.
Construction of road; Excavation; Construction of Sewerage system Construction of building and Construction Machinery Waste Generate by workers	Improper storage or handling of hazardous/ flammable materials including paints, fuels, solvents, oil, cement etc.; Dust due to construction activities like excavation, clearing, leveling, compaction etc.; Noise due to use of heavy machinery; Violation of applicable air pollutant emissions or ambient concentration standards; Safety issues for workers; and, Solid waste including food waste Collision of machinery while working/ improper parking	Hiring of reputable construction contractor with sound knowledge of environment and HSE. Substantial training of Workers before commencement of work. Implementation of formal emergency procedures as per code of work by contractor. Provision of all resources and PPEs consider essential to HSE. Monitor the performance of contractor/ workers. Necessary measures like sprinkling of water especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation. Control noise through control of working hours and selection of less noisy equipment. All heavy machinery should be parked at designated area. PPEs will be provided to the workers and its usage will be made mandatory. Implementation of measures suggested in EMP of subject study. Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety

The impacts on environment which are likely to be generated during execution of operational phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
Solid Waste – Liquid waste discharge	Open dumping of house waste in street or in plots; Discharge of liquid waste in open area; and, Epidemic diseases.	Proper drainage system should be ensured for liquid waste. Solid waste should be temporally dumped on designated area and picked-up by certified contractor on regular basis. Perform regular inspection of facility. Implementation of measures suggested in EMP of subject study. Avoid storage of hazardous waste more than a day. Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety. Ensure proper housekeeping; and, Check and review regularly all elements of control measures for their continuing effectiveness.

Proposed project is designed to appropriate standards and is fitted with adequate safety and monitoring methods and will be operated by competent person. Proposed project will be equipped with engineering controls and intended to evaluate the environmental impact of proposed operational activity to avoid damage to the environment and risks to safety. Comprehensive Environmental Monitoring and Environment Management Plans are prepared to satisfy the requirements of Punjab Environment Protection Act, 1997 [Amendment, 2012] and rules and regulations made thereunder. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project. The proponent / contractor will hire trained staff to ensure the enforcement of Environmental Management Plan. The equipment will be kept in proper condition to save the environment from any damage.

During construction phase; air quality, ground water quality and surface water quality will be monitored and in operational phase; solid waste and wastewater drainage will be monitored. Environmental Committee will be formed to attend and address the issues relating to environment, cleanliness, up keeping, aesthetic beauty of the project site, general environmental enhancement, tree plantation, vegetation promotion, planting of flowers and ornamental plants on site.

The mitigation measures have been recommended in the EIA Report based on the best available techniques which will facilitate the project to operate in environmentally friendly manner.

Based on the findings of this EIA, it can be concluded that the project has negligible adverse impacts on the existing environment and the proposed project is suitable from environmental point of view.

CHAPTER-1

INTRODUCTION

1.1 OVERVIEW

Murree, located in Punjab province, Pakistan, is a suburban area near Islamabad and serves as the administrative center of Murree Tehsil within Rawalpindi District. It also encompasses parts of the Margalla Hills adjacent to Islamabad and lies in the Pir Panjal mountain range, approximately 60 kilometers northeast of Islamabad and Rawalpindi, accessible via Murree Road. The British established Murree as a town shortly after gaining control of the region in 1850. Until 1876, it served as the summer capital of Punjab's provincial government, before the headquarters shifted to Simla. Today, Murree stands as one of the most prominent resort towns in the Galyat region of Pakistan.

As the tehsil's administrative hub, Murree also functions as a Union Council. It is bordered by Darya Gali and Rawat to the north, Ghora Gali and Tret Syedan to the west, Numbal and Mussyari to the south, and Ghel and Angoori to the east. The permanent settlement was established at Sunnybank in 1853. By 1857, a church had been consecrated, and the main thoroughfare, originally called Mall Road and now known as Jinnah Road (though still commonly referred to as "The Mall"), was completed. Major commercial facilities like the Post Office, shops selling European merchandise, tailors, and a hat store were set up near the church.

Murree's connection to Lahore via Rawalpindi through the railway made it a preferred summer retreat for Punjab's British officials. European-style accommodations and villas were constructed, giving the town a distinctly colonial appearance. Homes dotted the ridges and slopes, while nearby hills hosted British army camps during the summer. The town also attracted European tourists and those traveling toward Kashmir. Tangas (horse-drawn carriages) provided transport between Murree and Rawalpindi.

In more recent times, areas such as Bhurban and New Murree (Patriata) have emerged as additional tourist destinations. The Murree-Galliyat region is widely recognized across South Asia for its natural beauty and lush greenery. The population of Murree continues to grow due to increasing migration to the area.

To cope with increasing demand of houses, new constructions are required in this region. Keeping in view the increasing demands, M/S construction of huts & commercial building, Murree are in the process to start the development and construction of Apartments including Different huts consist on ground floor and upper floors under the name of **"construction of huts & commercial building on khewat no 09, khatooni no 18, khasra no 593, Charhan, tehsil murree, district rawalpindi**. The project is located at Charhan, Tehsil Murree, District

Rawalpindi. Proposed construction is planned will be developed on 80,106 Sq. ft. land area. The area under consideration is owned by the proponent wholly and no land acquisition is involved in this project. Land Ownership Document (Non-Encumbrance -Fard) of the project is attached as **Annexure-I** of this EIA report. The proposed project site is devoid of any tree or plants, 3-5 trees coming in premises which will be preserved in this project.

Total land owned by Proponent is 17 Kanals, 16 Marlas & 6 sqft. Total number of Huts are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 & 19 in the proposed construction. The land is fully owned by proponent and Farad-e-Malqiyat & Aks-e-Shjra is obtained by proponent & attached with this report. The Buidling will be developed in phases. Currently, in first phase proposed development and construction is planned to be done on Huts no 1-11 then 12-19. Total Land area which is 17 kanal, 16 marla and 6sqft. In first phase 1-5 huts will be constructed each Hut consists of 1 ground and 2 upper floors. In next phase 6-11 huts will be constructed, each hut consists of 1 ground and 1 upper floors. In another next phase 12-19 huts will be constructed, each hut consists of 1 ground and 1 upper floors except 15, 16 & 17 which is only ground floor. The land required for the project activity is owned by the proponent and no extra land acquisition involved in this project. The proposed site is located at Khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi.

The proposed project is one among the construction which are unique in many aspects providing various facilities to its residents. A spacious area for roads with footpaths and parking lots, ornamental plants and fancy lights is an integral part of this construction. Beautiful building design will add glamour to the natural scenic beauty of Tehsil Murree. It will play an important role in boosting the living standard of people in and around the vicinity of proposed project site. The current project will provide employment directly and indirectly opportunities to a large number of workers of all categories, both skilled and unskilled, during its development, construction and regular occupancy.

As already mentioned above, the land required for the proposed construction is fully owned by proponent and no land acquisition is involved in the said project.

As stated earlier, proposed project's site is situated in Tehsil Murree. Environmental Protection Department (EPD), Punjab has declared Tehsil Murree as Environmental Sensitive Area vide "Notification No. 304/56-G/LS/EPA dated 5th Nov, 2008". In light of mentioned notification, it is mandatory for proponent/ owner to submit Environmental Impact Assessment (EIA) in EPA Punjab and get Environmental Approval (EA) before initiating any type of construction activity in Tehsil Murree. Therefore, this EIA report has been formulated for the grant of NOC from Punjab Environmental Protection Agency, Lahore.

For further detail, refer to the write up under the caption, "Nature and Size of the Project" in this chapter".

1.2 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement of Section, 12 of Punjab Environmental Protection Act, 1997 [Amendment, 2012]; "Preparation and submission of IEE / EIA" for obtaining the Environmental Approval (EA) before starting project activity and **Schedule-II (Clause-I, All Projects Situated In Environmentally Sensitive Zones)** of Review of IEE/ EIA Regulations, 2000 stating Environmental Sensitive Area requiring Environmental Impact Assessment (EIA). The other relevant regulations and guidelines considered while preparing this EIA report include:

- » Policy and procedures for filing, review, and approval of environmental assessments.
- » Guidelines for the preparation and review of environmental reports.
- » Guidelines for public participation.
- » Guidelines for sensitive and critical areas.
- » Detailed sectoral guidelines.
- » Hazardous Substance Rules, 2003.

Different environmental aspects like social, physical biological etc. and other related features of the project both during construction & operational phases are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

1.3 IDENTIFICATION OF THE PROJECT AND THE PROPONENT

a. Contact Person

ZAFAR ULLAH KHAN S/O HAJI SHER DILL KHAN

PROPONENT

M/S Construction of Huts & Commercial Building
Address: H#39/39A, St#02, Sector-E, DHA Phase-2, Islamabad
Cell: +92-345-4646406; **E-mail**: sami.asconsultants@gmail.com

b. Consultant

A.S. Enterprises
Address: 33, Fazlia colony, main ferozpure road, shadman, Lahore

Tel: +92-345-4646406; **Email:** a.s.ent@outlook.com; **Web:** www.asconsultants.pk

1.4 NATURE AND SIZE OF THE PROJECT

The Murree Hills are studded with different types of buildings, including many multistoried structures. Industrial buildings include sawmills, small-scale cottage operations and medium to large-scale multistory poultry farms. There are also many shopping areas and a wide range of recreation facilities including golf courses that attract a large number of tourists.

The number of houses in the area has increased partly due to the rise in local population and partly due to investments by government and private agencies in developing military colonies, offices, educational institutions, hotels and guesthouses, and residential areas. Many of these are occupied only seasonally.

The whole construction of the said project is time bound and need to be processed to fast track for approval. The proponent is bound to construct the Grey Structure till September 2023. Therefore, EPA Punjab is also requested to proceed the case on fast track for Environmental Approval.

The number of tourists in the area has expanded quite significantly with the improvement of the roads and transport facilities. Other contributing factors include restricted international travel that has prompted many to spend vacations within the country, and improved national economy that has given a boost to domestic tourism.

The proposed project aims at construction of the Apartments/huts in the Tehsil Murree. The area under consideration for construction of Apartments/huts is owned by the proponent wholly and no land acquisition is involved in this project. The proposed building plan requires total land area of 80,106 Sq. ft. Total land owned by Proponent is 17 Kanals, 16 Marlas & 6 sqft. Total number of Huts are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 & 19 in the proposed construction. The land is fully owned by proponent and Farad-e-Malqiyat & Aks-e-Shjra is obtained by proponent & attached with this report. The Buidling will be developed in phases. Currently, in first phase proposed development and construction is planned to be done on Huts no 1-11 then 12-19. Total Land area which is 17 kanal, 16 marla and 6sqft. In first phase 1-5 huts will be constructed each Hut consists of 1 ground and 2 upper floors. In next phase 6-11 huts will be constructed, each hut consists of 1 ground and 1 upper floors. In another next phase 12-19 huts will be constructed, each hut consists of 1 ground and 1 upper floors except 15, 16 & 17 which is only ground floor. The land required for the project activity is owned by the proponent and no extra land acquisition involved in this project. The proposed site is located at Khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi

The existing state of area demands such development of modern and classic construction style by

keeping all important environmental factors in consideration. Project proponents are environmentally conscious of such developments and they are striving hard to cater all the environment related issues at the best level in their management. This EIA report is the proof of this consciousness that the management is going for the approval of their project before its implementation. This project of "Construction of Huts & Commercial Building" is designed to comply with local and national standards of pollution. This project will be a trendsetter in the area of Tehsil Murree in construction sector.

The design of the sectors has been finalized while keeping all the environmental and developmental factors in due consideration. The designing of Apartments has been made by highly experienced, qualified, and competent structural engineers following the latest building safety codes also. Protection from natural disaster like earthquake has also been considered according to the applicable safety codes. Further, the soil investigation of the land has been carried out by proponent to check the slope stability and the results shows that land under the proposed project is solid with negligible chances of soil failure. Further, to stabilize the structures.

The design of proposed construction plan of Apartments/huts has incorporated well-developed sewerage system and primary treatment of sewerage before its final disposal, which will cater the needs of residents of these apartments.

It is very hard, at this moment, to calculate the exact quantity of water required for the development of proposed Apartments during construction and operation. However, estimates are made in this EIA report based on the quantity of water used in similar projects. It is estimated that around 500-800 Gallons of water per day will be used during construction of infrastructure of the project. While the proposed project will consume around 1500-2000 Gallons per day water at its full occupancy by keeping in view that these apartments will not remain under residency throughout a year, it will be seasonal. The requirements of this water will be fulfilled by installing electrical water pumps. These water pumps will be installed. The designs of the buildings fulfill the latest safety and technical requirements of modern construction. The design of the apartments/huts fulfills the requirements of building by laws. It also incorporates the features that it should look neat and tidy, adding scenic beauty to the area around. Adequate open space has been provided around the apartment blocks in strict compliance with the Building Regulations, 2005 of TMA. This open space is necessary for proper ventilation, light and easy movement around the apartments/huts. The building regulations of the TMA have also been followed while designing the buildings of the proposed project.

As written above the proposed construction plan is located at Charhan, Tehsil Murree, District Rawalpindi. The land area of the project site is almost levelled and grassy.

1.5 LOCATION OF THE PROJECT

Construction of proposed project is planned to be sited at declared Environmental Sensitive Area of Tehsil Murree i.e., khewat no 09, khatooni no 18, khasra no 593, Charhan, tehsil murree, district rawalpindi. Location map of the proposed project is presented in Chapter-3, under heading "Project Location/ Site Layout" of this report.

1.5.1 SCOPE OF STUDY

For achieving the objectives of EIA, the study is mainly divided into the following sub-tasks:

- Identification of various legal / statuary requirements as set forth by the Punjab Environmental Protection Act, 1997 [Amendment, 2012] and the guidelines for preparation of EIA Reports and review of existing regulatory framework in the country with reference to the development projects;
- Collection of data related to physical, ecological, and socio-economic recourses of the project area;
- Identification and evaluation of salient environmental impacts;
- Identification of necessary mitigation measures to minimize the adverse impacts; and
- Preparation of an Environmental Management Plan (EMP).

The key steps followed while conducting EIA are briefly described below.

1.5.2 Review of Project Documents

Previous relevant reports have been reviewed for getting insight into the project area and related issues. Some offices and organizations were also visited for acquisition of published reports and data.

1.5.3 Reconnaissance Survey

The reconnaissance survey under this study was conducted on June. 31, 2025 by an interdisciplinary team consisting of Environmentalist, Health & Safety Specialist to conceptualize the project and understand the potential environmental and social impacts associated with the proposed project and also to familiarize the environmental setting and local conditions.

1.5.4 Data Collection

Both primary and secondary data were collected to accomplish the objectives of the study. The primary data was collected by

conducting field survey on June 14-15 year 2025 through environmental monitoring, individual interviews of local population, focus group discussions and consultations with local community, while secondary data was collected from the published government documents, i.e., Economic Survey of Pakistan, District Population Census, Multiple Indicators Clusters Survey, Weather data, Government Acts, Laws and Regulations. Based on the environmental checklist, socioeconomic questionnaires and area profile as well format for consultations, field surveys were carried out to collect data on the physical, biological and social environment aspect of the project site.

i) Physical Environment

The physical aspects of the project site covered the following:

- Soils - type of soils, erosion, stability
- Land use pattern of the area including agriculture crops, barren lands, industrial and residential use
- Affected buildings - residential, industrial, commercial, and structures of buildings
- Drainage pattern
- Available energy source(s)
- Other private/ public infrastructure/ utilities like pipelines, electric poles
- Water resources available both surface and groundwater
- Air quality and noise level in the project impact corridor

ii) Biological Environment

In consideration of ecological environment, the following main aspects were studied:

- Existing vegetation along the project impact corridor
- Trees likely to be affected due to the project implementation (if any)
- Endangered species both flora and fauna
- Wildlife in the project impact corridor
- Forests and game reserves existing along project impact corridor
- Beneficial plants and animals in the project impact corridor
- Aquatic life including fish resources
- Wetlands within the vicinity of the project impact corridor

iii) Social Environment

Social assessment has attempted to determine the social implications in terms of assumed positive and negative impacts as a result of the implementation of the proposed project. The socioeconomic baseline data covered the following major aspects**:**

- » Demographic profile
- » Population
- » Number of households
- » Literacy status
- » Nature of business/ occupations
- » Livelihood/ income
- » Living standard of the population
- » Access to credit
- » Social infrastructure available
- » Women issues
- » Community perceptions about the Project

1.5.5 Stakeholders/ Public Consultations

During the detailed field survey dated June 15, 2025; consultations were made with local community/ general public as well as intent officials. The basic purpose of these consultative meetings/ focus group discussions was to i) share information with stakeholders about the expected impacts of proposed development works on the physical, biological, and socioeconomic environment; ii) understand stakeholders' concerns regarding various aspects of the project, including the existing conditions and the potential impacts of the proposed project.

1.5.6 Data Processing and Analysis

After collecting all above data from different sources including interviews from communities, consultations, physical observations, and data compiled from other documents was analyzed. Accordingly, the results were presented through tables (means, percentage, number), graphical/ pictorial illustrations.

1.6 PERSONS PERFORMING EIA STUDY

EIA study of the project has been conducted by A.S Enterprises, according to the Review of IEE/EIA Regulations 2000, Pakistan Environmental

Protection Agency (Pak EPA), Punjab Environmental Protection Act, 1997 [Amendment, 2012], and other relevant Regulations and completed this EIA Report. List of names, qualifications and roles of team members carrying out the EIA study is provided as **Annexure-VII** of this document.

1.7 ROLES AND RESPONSIBILITIES

The executing firm/company/sole proprietor of the proposed project is Construction of huts & commercial building. Role and responsibilities have been proposed in the EIA report. Proposed mitigation measures, as defined in the EMP will be primarily implemented by the management of M/S construction of huts & commercial building, with responsibilities assigned to various departments. Project Proponent will strictly adhere to implementation of all mitigation measures contained in this report in order to minimize any negative impact on any component of environment during and after execution of project. Institutional arrangements have been suggested in Chapter-7 of this document, so that proposed mechanism of environmental protection shall work in time.

1.8 ROLE OF ENVIRONMENTAL PROTECTION AGENCY, PUNJAB

The main responsibility of Environmental Protection Agency, Punjab will be to monitor the mitigation measures, which will be taken up or implemented by proponent. EPA is endorsed to inspect compliance of sections 13, 14, 17, & 18 of IEE/ EIA Regulations, 2000, which enunciate the conditions for approval, confirmation of compliance, entry, inspection and monitoring of proposed project. Hence, EPA Punjab is the sole entity which is responsible to issue the necessary approval by exercising powers under section 12 of Punjab Environmental Protection Act 1997 [Amendment, 2012] after proper review of this EIA document.

1.9 ORGANIZATION OF EIA REPORT

The EIA report is divided into following chapter: Executive Summary

Chapter 1: Introduction

Chapter 2: Legal Framework

Chapter 3: Project Description

Chapter 4: Description of Environment

Chapter 5: Stakeholder Consultation

CHAPTER-2

POLICY, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

This section deals with the current policy as well as legal and administrative framework related to carrying out of Environmental Impact Assessment of various projects. Like other Projects, the proposed Project, before its execution, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection Act, 1997 [Amendment, 2012].

2.2 EXISTING REGULATIONS AND LEGAL FRAMEWORK

According to environmental laws of the country development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the proposed project has been categorized for EIA Study according to the Regulation "4" of Statutory Notification issued on June 13, 2000 (S.R.O.339 (1) /2001). The Proposed Project is Construction and development of construction of huts & commercial building, located in Tehsil Murree which is being declared as Environmental Sensitive Area. As per **Schedule-II (Clause-I, All Projects Situated In Environmentally Sensitive Zones)** of the IEE / EIA Regulations 2000 made under section 12 of Punjab Environmental Protection Act, 1997 [Amendment, 2012] under which the Environmental Impact Assessment (EIA) is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

This EIA Study has been carried out in the light of the policy guidelines of the Government of Pakistan, under the procedures and practices formulated by the Provincial Environmental Protection Agency (EPA-Punjab).

2.3 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

The applicable laws for the environmental study of the proposed project are briefly given below. The proponent of the proposed project will abide by the applicable laws and regulations.

2.3.1. NATIONAL CONSERVATION STRATEGY, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life.

The strategy has three overriding objectives: conservation of natural resources,

sustainable development, and improved efficiency in the use and management of resources.

2.3.2. PEPO, 1983 AND PEPA, 2012

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO), which was replaced by the Pakistan Environmental Protection Act (PEPA) 1997, through an Act of Parliament. Now the PEPA 1997 has been replaced by Punjab Environmental Protection Act, 1997 [Amendment, 2012] on 18th April, 2012. Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

Under section 12 of the Punjab Environmental Protection Act, 1997 [Amendment, 2012] it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project. This study has also been carried out under section 14 "***Handling of Hazardous Waste***" of the Punjab Environmental Protection Act, 1997 [Amendment, 2012] stated "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 Provincial 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".

2.3.3. NATIONAL ENVIRONMENTAL POLICY 2005

The national environmental policy 2005 aims to protect, conserve and restore the environment in order to improve quality of the life of citizens through sustainable development and resource conservation. The main objectives of the policy are;

- Conservation, restoration and efficient management of the natural resources.
- Integration of the environmental considerations in policy making and planning process.
- Capacity building of government agencies and other stakeholders at all levels for the better environmental management.
- Meeting international obligations effectively in line with the national aspirations.
- Creation of a demand for environment through mass awareness and community mobilization.

2.3.4. NATIONAL FOREST POLICY 2001

This policy covers the Renewable Natural Resources (RNR) of Pakistan i.e. Forests, Watersheds, Rangelands, Wildlife, Biodiversity and their habitats. The policy seeks to launch a process for eliminating the fundamental causes of the depletion of RNR through the active participation of all the concerned agencies and stakeholders, to realize the sustainable development of the resources. It is an umbrella policy providing guidelines to the Federal Government, Provincial Governments and territories for the management of their RNR. In consonance with it, the Provincial and District Governments may devise their own policies in accordance with their circumstances.

The goal of this policy is to foster the sustainable development of RNR of Pakistan, for the maintenance and rehabilitation of its environment and the enhancement of the sustainable livelihoods of its rural masses especially women, children and other deprived groups. The elements of the policy are as follow:

1. Population planning in critical eco-systems.
2. Providing substitutes to firewood in the wooded mountains.
3. Reducing the impact of socio-economic causes.
4. Reducing poverty, poverty of opportunity, and powerlessness.
5. Reducing political interference in the Forestry and Wildlife Departments.
6. Renovating and invigorating the institutions of RNR.
7. Supporting Local Governments in the sustainable development of their RNR.
8. Policies for fragile natural Eco-systems.
9. Riverain forests.
10. Irrigated Plantations.
11. Preservation of relict and unique forests.
12. Wildlife.
13. Rangelands and desert eco-systems.
14. Planting of trees and fodders on farmlands.

2.3.5. REVIEW OF IEE AND EIA REGULATIONS, 2000

The GOP has issued Review of Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) Reports.

2.3.6. GUIDELINES FOR THE PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS, 1997

The GOP has also framed guidelines for the preparation and review of IEE/EIA of projects in various developmental sectors.

2.3.7. PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

Powers conferred under clause (c) of sub-section (1) of section 4 of Punjab Environmental Protection Act, 1997 [Amendment, 2012] has been approved the Punjab Environmental Quality Standards (PEQS), 2016 for municipal and industrial effluents, noise, drinking water, motor vehicle exhaust, air emissions, industrial gaseous emissions and treatment of liquid & disposal of biomedical waste.

2.3.8. GUIDELINES FOR SENSITIVE AND CRITICAL AREAS

GOP has issued Guidelines for Sensitive and Critical Areas in October, 1997. The objective of the guideline is to provide guidance to project proponents and other stakeholders in the environmental assessment process, so that the proposed projects are planned and sited in way that protects the values of sensitive and critical areas.

2.3.9. POLICY & PROCEDURES FOR THE FILING, REVIEW & APPROVAL OF ENVIRONMENTAL ASSESSMENTS, NOVEMBER-1997

Environmental Assessment is the Primary means of managing the approval of new development proposals in Punjab. Environmental Assessment allows for the systematic examination of proposals, clear procedures which provide for the interests of relevant Government Departments and other stakeholders to carefully consider the environmental impacts of new developmental projects.

2.3.10. GUIDELINES FOR PUBLIC CONSULTATION, PAKISTAN ENVIRONMENTAL PROTECTION AGENCY OCTOBER, 1997

This guideline is part of a package of regulations and guidelines which include:

» Punjab Environmental Protection Act, 1997 [Amendment, 2012]
» Policy and Procedures for filing, review and approval of environmental assessments
» Guidelines for the preparation and review of Environmental Reports
» Guidelines for sensitive and critical areas
» Punjab Environmental Quality Standards (PEQS)
» Detailed sectoral guidelines

2.3.11. PUNJAB WILDLIFE PROTECTION ACT, 1974

This act was framed in 1974 by the Province Punjab and is about of protection and conservation of Wildlife.

2.3.12. FOREST ACT, 1927

This act was framed in 1927. The Forest Act, 1927 is still the basic charter for the forest departments in Pakistan. This law empowers provincial governments to manage forest areas.

2.3.13. PUNJAB LOCAL GOVERNMENT ORDINANCE, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. Under the Ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

2.3.14. PAKISTAN PENAL CODE, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in Section 268, which defines and recognizes noise as a public nuisance. “A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger or annoyance to the public or to the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right.”

2.3.15. OCCUPATIONAL HEALTH

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

2.3.16. TOXIC OR HAZARDOUS WASTE

Protection of the environment with regards to toxic and hazardous waste is covered by the Pakistan Penal Code (PPC), 1860. Environment Protection Department (EPD), Punjab, is mandated to monitor the transportation of hazardous materials within the provincial limits.

2.3.17. HAZARDOUS SUBSTANCE RULES, 2003

Rule 5 stated that project/ industrial activity must be accompanied by Environmental Impact Assessment (EIA) involving generation, collection, consignment, transport, treatment, disposal, storage, handling/ import of hazardous substance in respect of which the license is sought.

CHAPTER-3

PROJECT DESCRIPTION

3.1 TYPE AND CATEGORY OF PROJECT

According to environmental laws of the country, development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the project under consideration has been categorized for EIA Study.

The Project is the development and construction different huts/Apartments under the name of "construction of huts & commercial building" in Charhan, Tehsil Murree. The total land for this society is 17 kanals,16 Marla's & 6sqft. Total land owned by Proponent is 17 Kanals, 16 Marlas & 6 sqft. Total number of Huts are 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18 & 19 in the proposed construction. The land is fully owned by proponent and Farad-e-Malqiyat & Aks-e-Shjra is obtained by proponent & attached with this report. The building will be developed in phases. Currently, in first phase proposed development and construction is planned to be done on Huts no 1-11 then 12-19. Total Land area which is 17 kanal, 16 marla and 6sqft. In first phase 1-5 huts will be constructed each Hut consists of 1 ground floor and 2 upper floors. In next phase 6-11 huts will be constructed, each hut consists of 1 ground and 1 upper floors. In another next phase 12-19 huts will be constructed, each hut consists of 1 ground and 1 upper floors except 15, 16 & 17 which is only ground floor. The land required for the project activity is owned by the proponent and no extra land acquisition involved in this project. The proposed site is located at Khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi. Majority of these huts/apartments will be used on seasonal basis. The total cost of project is about Rs. 01 billion including the cost of land and development. This project requires NOC / License under Section 12 of Punjab Environmental Protection Act 1997(Amendment,2012) and Schedule-II (Section-I) (Environmental Sensitive Area) of Review of IEE/ EIA Regulations, 2000. The Environmental Impact Assessment (EIA) fulfills the mandatory requirement for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project. As mentioned earlier, proposed project's site is situated in rural limits of Tehsil Murree. Environmental Protection Department (EPD), Punjab has declared Tehsil Murree as Environmental Sensitive Area. It is mandatory for proponent/ owner of project sited in environmental sensitive area to submit Environmental Impact Assessment (EIA) in EPA Punjab and get Environmental Approval (EA) before initiating any type of construction activity in

Tehsil Murree. It is a purely residential construction comprising of model apartments/huts along with a number of other facilities for its residents.

3.2 OBJECTIVES OF THE PROJECT

Due to growing population and urge for better living standards of life, demand for new western style buildings having all of modern facilities of human need, has been raised during recent years. Construction of huts & commercial building has planned to develop the Apartments/huts Buildings in Tehsil Murree. Keeping in view the growing demand of modern style buildings and need for better living society, they are going to start the development and construction of Apartments/huts on land already owned by proponent located at khewat no 09, khatooni no 18, khasra no 593, Charhan, tehsil Murree, district Rawalpindi. The project aims to offer better living standards, achieve design/ construction features of buildings matching with applicable standards. For more details, please refer to "1-Introduction-Nature and size of the project" above.

3.3 ALTERNATIVES CONSIDERED & THEIR REASON OF REJECTION

Construction of huts & commercial building in Murree is purely a residential venture. To fulfill the viable aspects of the residential property under reference of this EIA Report, it is to be sited at a place where there are bright prospects and need of the same. It should also meet the legal requirements of the Town Municipal Administration (TMA) in the matters relating to the land use conditions of the project area.

An analysis of available alternatives is necessary to establish that the most suitable management and technology options will be adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of appropriate option that was required to ensure optional results within defined set of economic environmental, health and safety constraints. In particular, it outlines the following project options:

1. The "No-Development Option"
2. Alternative Site Option

1. No Development Option: No project means there would be no project at all. The no project option, if taken, would stop the community from an important and necessary project which is the need for today as per limited resources/ facilities being provided to general public. Other impacts of the 'No project' option would be loss in employment and social welfare in the project area, as the project is bound to create jobs and improve the lifestyle of the community of the area through different community development

and social welfare projects. From the environmental point of view, this option would result in the loss of opportunity in further improvement of the environmental management of the area, environmental baseline data, and the mitigation and compensatory programs.

2. Alternative Site Option- Site Selection Criteria: In reference to the project alternatives, 2 sites were visited but due to lack of land documents and desired kanal for proposed project, those sites were rejected. One reason of site selection is that Image heights apartments is under construction near proposed land, local community also lives there. Further, the proposed site is located in already developed area and know the final selection of site is based on following criterion:

- **Accessibility:** The site should be accessible from a permanent road to allow ready transport.
- **Water Supply:** Availability of adequate water supply, which should also meet drinking water standards.
- **Soil Condition for civil structures:** Suitability and stability of soil conditions required for civil structures
- **Sufficient land availability:** Availability of sufficient land to design and layout plan in an appropriate manner, with consideration of future expansions.
- **Electricity:** Availability of electricity from the National Grid for an uninterrupted supply of power, required for the project.

In view of all above criteria regarding site selection, it is to be sited at a place where there are bright prospects and need of the same. It should also meet the legal requirements of the Town Municipal Administration (TMA) in the matters relating to the land use conditions of the project area**.** The infrastructure and cable network is already present at the proposed project site. Availability of access road, communication facilities, electricity, basic infrastructure, sewerage etc. is another necessary requirement for the proposed project which are already available at the proposed site.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with new sculpt, comfortable and luxury residential apartments in the area.

All the above stated qualities for an ideal site for proposed project are present in the selected project site. All the other basic infrastructural requirements are also available at the selected site. Accordingly, the selected site is best suited for construction of the residential scheme.

Such projects are dire need of time by keeping in mind the growing rate of tourism in Pakistan. With due attention to environmental protection and implementation of mitigation measures suggested in this EIA report; the construction of Apartments is a blend of elegant location, most efficient and cost-effective design, elaborated by quality construction, is simply the best. Therefore, the present site is ideally suitable for this project.

Further, most importantly the issue of land ownership was taken into consideration during finalization of site. There are serious issues of land ownership in Murree area. The NEC Farad of land is obtained by Proponent. Copy of the Farad is attached as annexure in this report.

3.4 PROJECT LOCATION/ SITE LAYOUT

The project site is located at Tehsil Murree as mentioned earlier. The stated area is being declared as Environmental Sensitive Area as per EPA Notification No. 304/56-G/LS/EPA. Proposed project site is an open area surrounded by residential land. Project site is ideally located at easy access to Murree Expressway (N-75) also known as Murree-Islamabad Expressway. Project location map has shown in figure 3.1 below. Project layout plan is attached as Annexure-III; however, the detailed location map is attached as **Annexure-IV**. Digital topographical map of Lawrence Collage Road Murree (Proposed Project land) is attached as Annexure V.

Commercial activities are going on along the Murree expressway and the commercial activities are increasing rapidly in this area. Land use in the surrounding of the project area is described as below:

North: Open land

South: Main Road

East: Open land and vacant plots

West: Open land and vacant plots

Figure 3.1: Location Map of Project Site

3.5 LAND USE AT THE PROJECT SITE

The project site is owned by the Proponent and is currently vacant. 3-5 trees are present at the land, considered for current construction. These trees will be preserved during construction and development of apartment. Proposed area is almost levelled and grassy. The land for proposed construction of huts & commercial building is easily accessible from main Lawrence Road and Murree-Islamabad Expressway N-75 roads. The Land Ownership Documents (Non-Encumbrance- Fard) is appended as **Annexure-I.** The land is owned by proponent so no litigation is involved in this project. Consolidated Certificate issued by Patwari is attached as **Annexure-II** which clearly shows that no litigation is involved in the project and the land is fully owned by proponent.

3.6 ROAD ACCESS

In order to facilitate developments and growing tourism, basic infrastructure facilities like roads network, natural gas, water and power supply, means of transportation and communications etc. are being improved/ developed speedily. The site is easily accessible through Surasai road. The site is ideally located at easy access to Lawrence Road which connect the site to N-75 Murree-Islamabad Expressway, tourism hwy Road, Link Surasai Road are other main roads which are connected to the site.

3.7 VEGETATION FEATURES OF SITE

Project site is situated within the low population area of Tehsil Murree and is surrounded by Murree City and new Murree patriate. On account of unfavorable environment and due to site presence in already developed village the natural flora has been shifted to upper regions. However, few varieties of faunal species are present in the area; Details of vegetation features are covered in Chapter – Description of Environment. However, this is worth mentioned that there are only 3 trees present on the land under consideration at the moment. These trees will be conserved during the whole developmental process. This project is based on the idea of **NO TREE CUTTING**.

3.8 ENERGY/ POWER SOURCE

As mentioned above in this EIA report, the project under reference of this EIA is construction of huts & commercial building and there will be no high energy consuming process/activity involved in this project. The energy will be required to fulfill the household and small commercial requirements of the apartments. This energy will be supplied by Water and Power Development Authority (WAPDA) to the occupants of the proposed apartments/huts.

It is estimated that around 15-20 KW energy will be required during the operational of infrastructure of the project while around 60-80KW energy will be required during full occupancy of the said project.

3.9 WATER REQUIREMENT

Adequate quantity of underground water is available to meet even all the project requirements. The quality of water is also satisfactory. This factor also supports the decision regarding sitting of the project at the existing site.

It is projected that around 500 – 800 Gallons of water will be used on daily basis during construction of the said project. Water requirement of the proposed project will be met via extraction with installation of electrical water pumps. It is estimated that about 1500-2000gallon per day of the water will be needed during regular occupancy phase of proposed project. It is worth mentioning that proposed project doesn't involve process water; the stated quantity of water will be required for sanitation purposes/ allied activities only. Therefore, this negates the major concern of effluent generation as well. It is pertinent to mention here that majority of residents of these huts will visit this area on seasonal basis. Therefore, this quantity of water will only be required during peak season.

3.10 SOLID WASTE

The garbage collection system is embedded in the designing of proposed construction of Apartments. Approximately 40 - 50 kg per day solid waste will be generated during full occupancy of the apartments. All type of solid waste will be segregated at the point of their generation. Recyclables including plastics, metal, paper, glass, rags will be sold in the market while the leftovers will be duly disposed of at designated site for solid waste disposal. To accomplish this all, a comprehensive system is already in place with state-of-the-art equipment and operation system by Rawalpindi Waste Management Company (RWMC). The waste produced by the project activities will be purely municipal waste and the already working RWMC will also be taking waste of the project during its regular occupancy. A contractor will be hired to transport the waste to a central point for collection by RWMC.

3.11 PROJECT COST & MAGNITUDE OF OPERTAION

The estimated capital cost of the proposed project is about PKR Rs. 01 billion including land and development cost. The quantities have been worked out from the design drawings. The rates for cost estimates are based on land cost, construction work, contractor cost and cost of the equipment/ machinery with 10% escalation. At operation stage, the project proponent will be involved for operation and maintenance

of the proposed facility. The development under reference of this EIA will be spread on an area of 17 Kanals,16 marlas & 6 sqft. Components of the proposed project are already described in the earlier part of this report. There will be no industrial process/ activities associated with the project.

3.12 SCHEDULE OF IMPLEMENTATION

Proposed project is settled for Environmental Approval to start its implementation. It is planned that the following schedule of project implementation will be adhered to. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered.

The implementation stages of the project activity include[1]:

Stage I (Nov. 2025)

Boundary markings and plotting of the said land.

Stage II (March., 2026)

i- Work on pavements, roads

ii- Sewerage system along-with provision of other basic facilities like electricity, telephone and parking etc.

iii- Lying of foundations excavation and commencement of erection work.

Stage III (Jan. – July., 2026)

Simultaneously grey structure of proposed 4 story apartments will be started.

[1] *All dates/ periods for project start are tentative and likely to change depending upon the circumstances.*

Stage IV (Sept., 2026)

Completion of Grey Structure.

It is estimated that construction of the structures of the building will take almost 1.8 years.

3.13 DESCRIPTION OF THE PROJECT

The project has been duly described at: "1-Introduction- Nature and size of the Project-Purpose of the report, identification of the project and the project proponent."

3.14 DETAILS OF RESTORATION & REHABILITATION PLANS

Construction of huts & commercial building in Tehsil Murree being a purely residential venture, will continue to maintain its highly organized way of work including restoration and rehabilitation in environmentally friendly way even at the end of the first life of the project. Since it is a residential project therefore to lend the project another life, rehabilitation work of the entire project will continue so that the project remains as useful and viable during its second life like its first life. Rather, the

then state of the art technology in residential sector will continuously be adopted so as to keep as a state-of-the-art construction for years over end.

Major rehabilitation work will include filling back the excavated land, debris disposal according to internationally sustainable practices, scientific disposal of all sorts of solid wastes and grass plantation on pre-planned areas, cleaning of unpaved areas etc.

Debris or any other wastes resulting from demolishing of the buildings will be disposed-off in environmentally sustainable fashion. The materials capable of recycling/ reuse will be either sold in the market or to be reused for other suitable purposes. While dismantling the structures all Government rules and regulations as applicable to such activities will be strictly adhered to.

During entire construction period, necessary precautions will be taken to ensure that no damage will be done to the basic infrastructures like power transmission lines telephone lines, roads, private or public property and daily human life as well.

Safety measures as desired under the code of demolition will be adopted to avoid any harm to humans, property around or the environment in the project area. Dust to be generated will be minimized by constant sprinkling of water. After completion; all construction matrix, debris and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean to maintain the scenic beauty of the area.

3.15 GOVT. APPROVALS AND LEASES REQUIRED BY THE PROJECT

Project Proponent has accorded approvals/ certifications for their project from all relevant regulatory bodies successively. The land is totally owned by proponent and and other local communities are already existing there. Approvals obtained from different departments so far are attached with the report.

All of these approvals have been provided under **Annexure-VIII** of this document. So far, the Environmental Approval from the EPA, Punjab, Lahore, is the major requirement for which this EIA report has been prepared and submitted.

CHAPTER-4

DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influence area with respect to the physical, biological, and social aspects. In addition to the secondary data, the field survey was carried out in June, 2021 and the environmental baseline conditions were established based on socioeconomic interviews[2]; impact location profiles; environmental profile questionnaires and public consultations.

4.2 PHYSICAL RESOURCES

Following is a brief description of various physical resources of the Project Site.

4.2.1 Topography, Geology & Soil

Proposed project site is located at 33° 52' 43.4028" N 73° 27' 54.378" E. Project site is at distance of 75 km from the fourth-largest city in Pakistan by population i.e., Rawalpindi. The proposed project area is situated at khewat no 09, khatooni no 18, khasra no 593, Charhan, tehsil Murree, district Rawalpindi.

District of the area is divided into three distinct portions including Murree, Kotli Sattian tehsils and northern portion of the Kahuta Tehsil. Physical features of the district exhibit a rich variety which is continental in dimensions. Here are found mountains, forests, plateau, valleys, ravines, torrents, streams, plains and all possible species of topography which the physical process could produce during the course of ages. The Murree hills are offshoots of the Himalayan system. They rise in spurs rising to heights between 2133 to 2438 meters. The project area hills are covered with wild olive, blue pine and acacia species.

South-west of the Murree and Kahuta hills stretches a rough high lying pleateau about 548 meters (1,800 feet) above sea level. The northern part of this pleateau includes tehsils of Rawalpindi and the portion of Tehsil of Kahuta. It is drained by the Soan and its tributaries. **Annexure III** represents topographic map of project site Lawrence Road Murree and the surrounding area has been derived from satellite mapping. The topographic data has been illuminated by a light source corresponding to the position of the sun at mid-afternoon in summer.[3]

Brief demographical profile of city is mentioned in Table 4.1 below.

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[2]Households resided in the vicinity of the project area, selected randomly and interviewed.
[3] *Source: http://www.weather-forecast.com/locations/Murree*

Table 4.1 Demographic profile of Rawalpindi

Item	Unit	Value
Total area of the District	Sq.km	5,286
Tehsils	Number	7
Density	Sq.km	1,322
Union Councils	Number	46
Total population of the District (census 2017)	Number	5,405,633
Population (male)	Number	2,663,075
Population (female)	Number	185,647
Transgender	Number	686
Literacy rate of the District	%	70.5
Average household size	Number	6.1

Source: Rawalpindi District: district in Punjab Province, Pakistan

Soils form major relation with environment. They influence environment by their special qualities and more so through fertility. Strongly developed soils are scarce in the project area, perhaps because of the seasonally dry climate and the lack of stable surfaces caused by alternation of erosion and loess deposition. Soil of the project area is classified as silt plus clay contain as little as 40.5 percent silt and clay.

The Project Area does not have any valuable minerals. Coarse pebbles together with sand and clay make up the lowest layer which is of alluvium nature deposited by older system of Soan Basin over the pebble bed. The alluvium deposits same river system comprises the subsequent layers. The air borne top layer of silt or clay is called loess and the top most one is gravely conglomerate.

Geological studies were carried out to know the existing geological conditions of the project area. The site is located in a broad valley with steep slopes. The valley is formed due to rapid erosion relatively weak rocks of Murree formation. The valley from Murree to Bhara Kahu consists of Murree formations tightly folded and form series of sharply bending anticline and synclines. These tight folding created numerous weak zones for erosion and formation of narrow steep sided valley from Murree City to Bhara Kahu. Murree formation where the site is located is of oligocene and milocene age. The Murree formations are present at the foot of Himalayan Mountain Range. In the south-west direction a fault separates Murree formation from Margala and kuldana lime stone formation of Paleocene age. In North-West, Muzaffarabad lime stone and Hazara slates are present on the eastern side. Formation of gullies and steep slope hill rocks is also a very prominent feature of Murree formations. Shearing and Minor faults are also present from place to place.

Rocks present at the project site are sandstone and shales. The sandstone is present in the form of thick beds. These sandstones are moderately hard to well cemented. The texture of sandstone is fine to medium grained, however, some coarse grained sand stone is also present.

The tract is generally covered with the colluvium material comprising of silt clay with embedded angular rocks fragment of various sizes covered with grass. The shales beds are thick in the proposed project site; the lower Murree formations have dominantly these shales of claystone. Figure 4.2 shows the types of general geological conditions in the NWFP regions and Northern part of Pakistan.

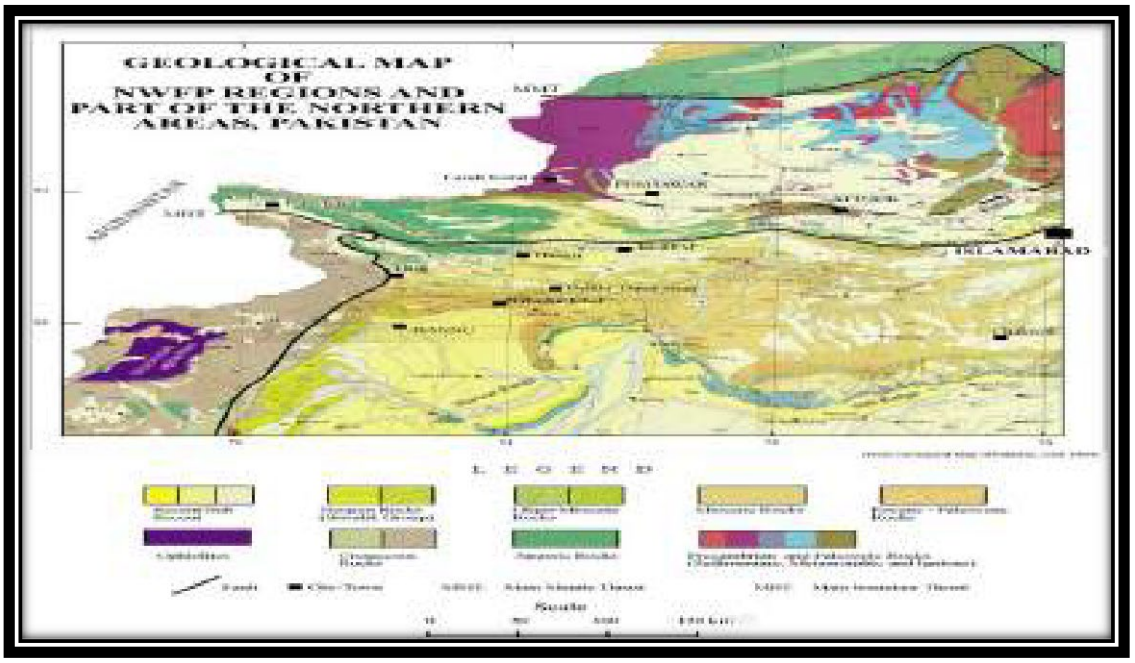


Figure 4.2: Geological map of Northern Areas of Pakistan

4.2.2 Hydrology

The project area lies at the moderate slope with upward and downward steep slopes of the hill side on overburden of 3 m to 9 m thick. The overburden is underlain by Murree formation comprising alternate beds of sandstone and siltstone having varying thickness with shale as dominant rock. The beds of sandstone and siltstone are highly disturbed due to tectonically activities in the past. The outcrops of sandstone, silty sandstone and shale can be observed at places in the project area. The general strike of the area is north-east and dip ranges from 26 degree to 43 degree towards south east.

Underground Water

The ground water table in project area is 10-15 m deep. A supplemental network of

municipal and private wells as deep as 200 meters (m) produces ground water primarily from quaternary alluvial gravels. The strata of the subproject area are water bearing and alluvial deposits, giving groundwater potential throughout the locality. The local population is generally reliant on supply from the hand pumps. The chemical quality of ground water varies in different areas and at different depths. Potable water is available in the area. Irrigation supplies are perennial and tube wells have been installed to make up the deficiencies. Table 4.2 shows the number of diesel and electric Tube wells installed in district.

Table 4.2: Diesel and Electric Tube wells

Total Number of Wells	Government	Private
18,823.0	58.0	18,765.0

The chemical quality of groundwater is:

- Generally fresh in the area along the rivers: and
- Brackish/ saline in the central parts of the Doabs

One of the reasons of poor groundwater quality at shallow depth in the area is water logging in the past. Whereas, different impervious thick clay layers at depth up to 450 ft. separate the shallow aquifer from the fresh groundwater aquifer at depth. Therefore, the groundwater quality in the project area improves with depth.

Surface Water/Wet Lands

The Soan River along with their tributaries are the main sources of ground water recharge and surface water supplies in the area. The Kurang and Soan Rivers are dammed at Rawal and Sambli Lakes, respectively, to supply water for the semi-urban area. The water supply system of district Rawalpindi is shown in figure 4.3 below

4.2.3 Seismicity

Seismic Zoning Map of Pakistan showing Proposed Project site area is presented as Figure – 4.4, indicating zones according to the Building Code of Pakistan - 2007. The project site is located at District Rawalpindi, the project site falls in Seismic Zone 2A according to the Seismic Zoning Map of Pakistan. Zone 2A (moderate limit of high damage) represents peak ground acceleration (PGA) from 0.8 to 1.6g.

Figure – 4.5 presents the WHO Seismic hazard map of Pakistan prepared for Peak Ground Acceleration (PGA) for 500 years return period, with intensity level at “medium category”.

Figure 4.3: Water supply system in Rawalpindi

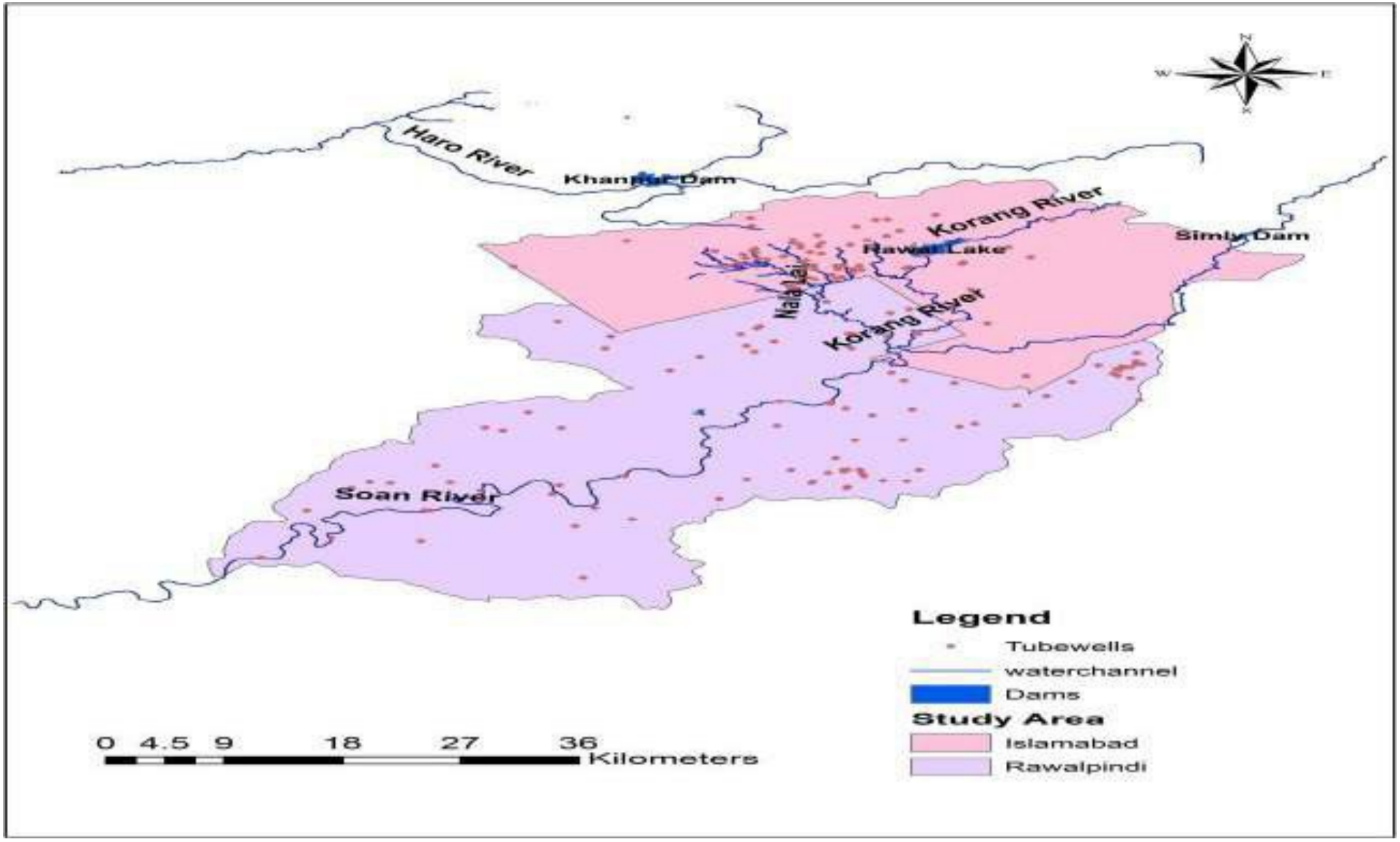


Figure 4.4: Seismic Zoning Map of Pakistan

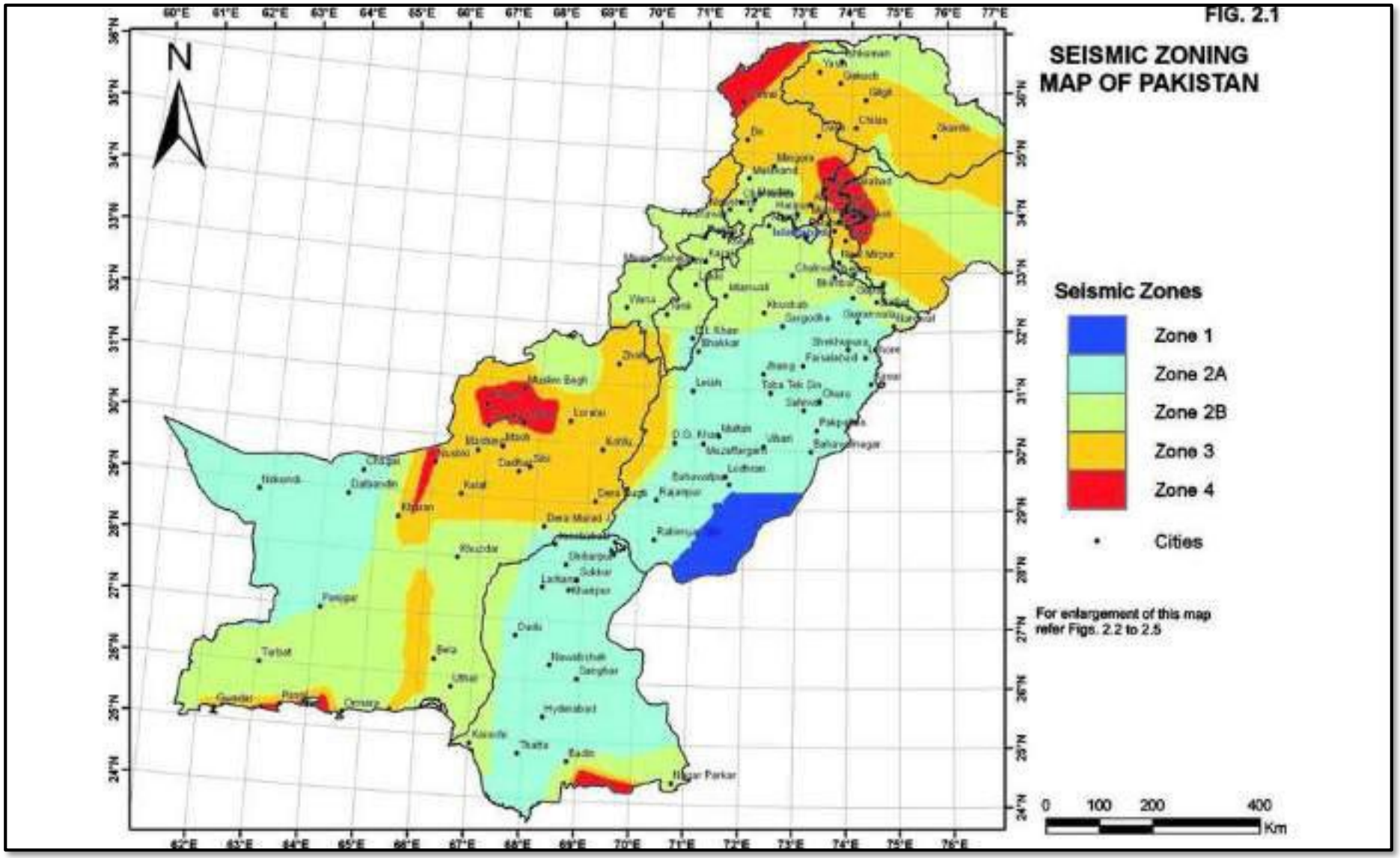
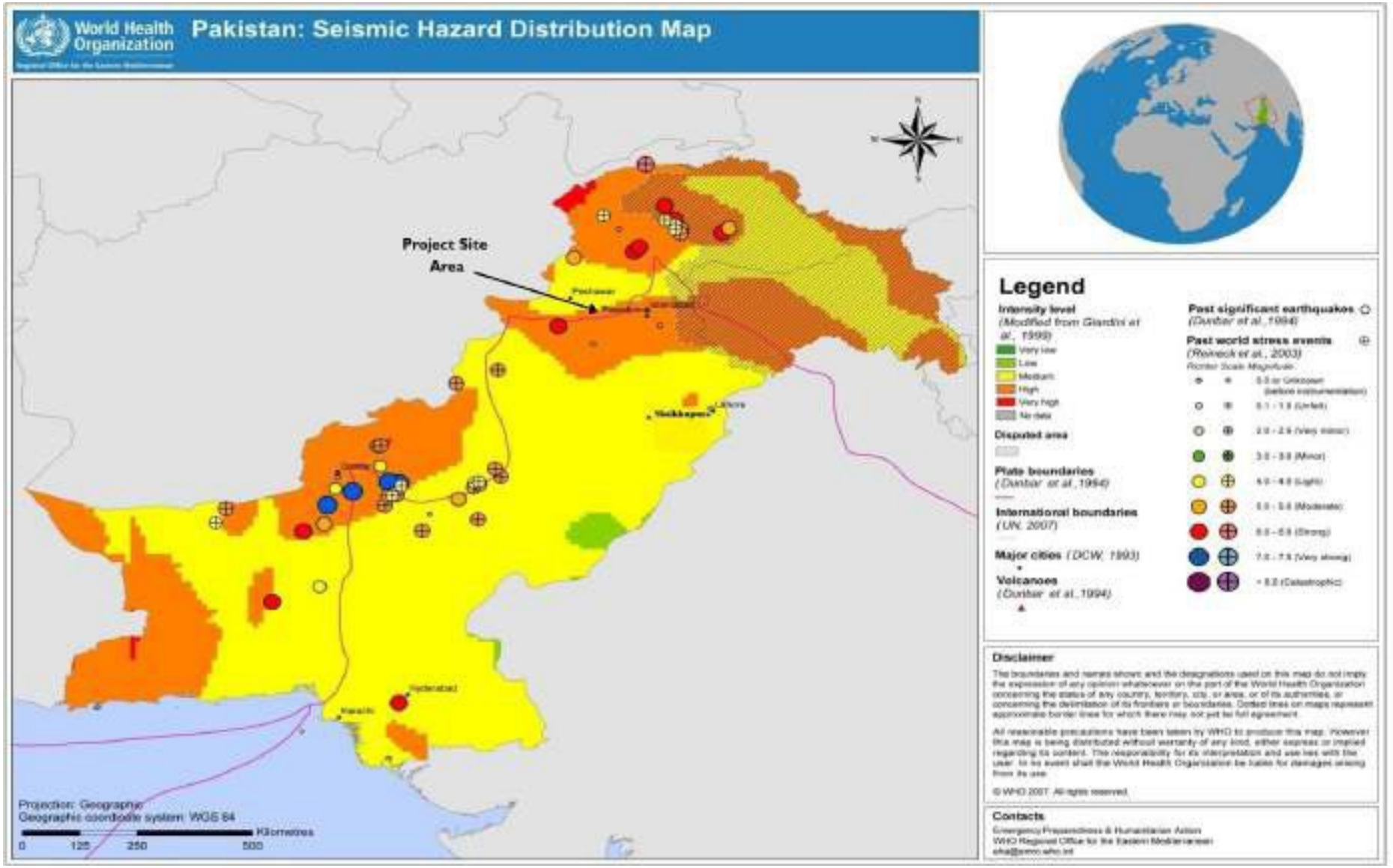


Figure 4.5: WHO Seismic hazard map of Pakistan



4.2.4 Climate

Pakistan is situated on the western margin of one of the main regions of the world—the monsoon region. Due to this, the climate of the country is more Continental than that of the other parts of Subcontinent.

Seasonal climatic conditions inter alia other environmental issues must be considered for the design and execution of a project. The climate as an influencing factor affecting the project and other engineering structures are the mean physical and chemical conditions including air, temperature, precipitation and humidity. However, to determine the overall effect of the climatic stresses, daily and seasonal temperature changes, site altitude, direct solar radiation, and precipitation must be considered.

The climate of the project area is classified as sub-humid to sub-tropical continental, receiving rainfall from both monsoon and western disturbances.

Temperature

The project area has hot summer and cold winters. In Murree, the mean maximum temperature ranges from 10.2 ºC to 28.6 ºC and the mean minimum temperature ranges from -2 ºC to 1.1 ºC (July, 2020 to June 2021). **Table 4.3** shows the mean maximum average temperature and mean minimum average temperature from April, 2020 to March, 2021 respectively.

Table 4.3: Month-wise Mean Min. & Max. Temperature (°C)

Mean Temp.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min.	-1.6	0.3	4.1	8.8	13.1	16.7	18.7	18.1	14.7	9.2	4.3	0.2
Max.	10.9	12.3	17	22.1	26.8	28.6	26.6	25.8	24.8	22	17.5	13.8

Source: www.Climatdata.Org

Humidity

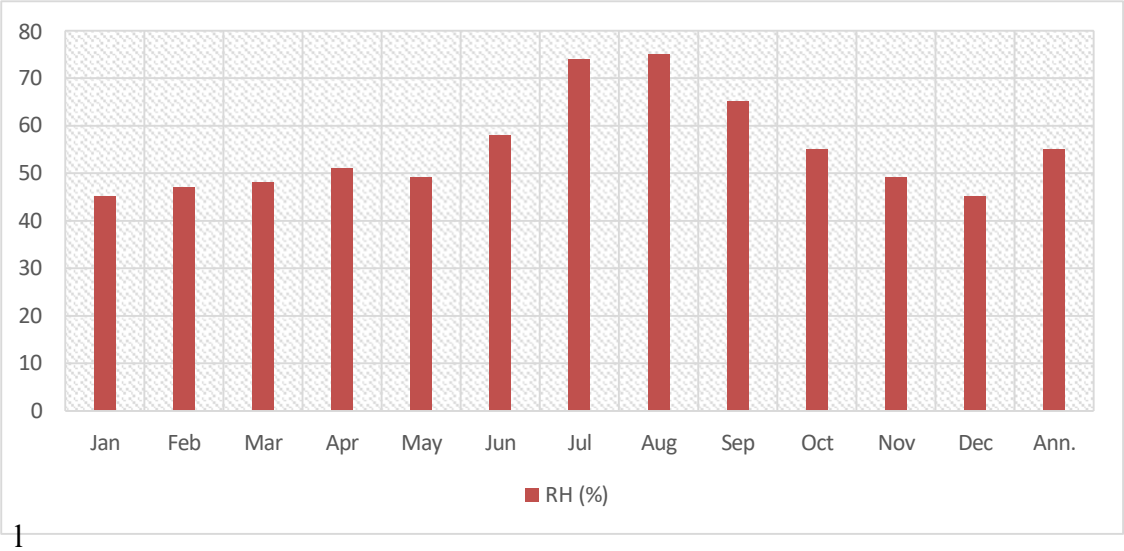
The humidity variation in the year 2021 from January to July in project area ranges from 45% to 75%. Month-wise relative humidity values are shown in Table 4.4.

Table 4.4: Month-wise Relative Humidity

RH (%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
	62	64	61	57	50	56	78	82	73	61	60	60	61

Source: Climatedata.org, 2021 (Website).

Figure 4.5: Month-wise Relative Humidity



1

Climate in region is warm and temperate. When compared with winter, the summers have much more rainfall. The rainfalls mainly occurred during the months of July, which is commonly known as monsoon month. The wettest month (with the highest rainfall) is July (251mm). The driest month (with the lowest rainfall) is November (44mm). Month-wise total rainfall is presented in table 4.5.

Table 4.5: Month-wise Total Rainfall (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Rain-fall	111	189	208	155	92	118	251	220	111	48	44	69	941

Source: Climatedata.org 2021 (website).

Wind Direction

The predominant wind direction is from South-West (SW) to North-East (NE) directions. The average and maximum wind speed for District Rawalpindi is indicated

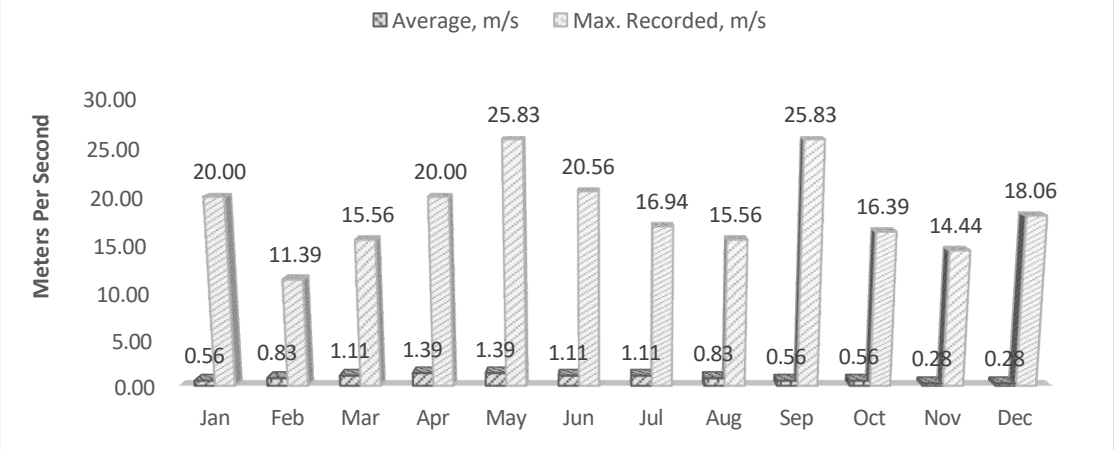


Figure 4.6: Average and Maximum Wind Speed

ECOLOGICAL RESOURCES

4.2.5 Biodiversity

Mainly a country's wilderness areas and scenic landscapes with their associated flora and fauna form natural capital of a country. The contribution of the "Natural capital" is recognized at three distinct levels including genera, species, and community-habitat and ecosystem. Pakistan comprises of a total of nine major ecological zones and the term has relevance for each of Pakistan's administrative units—district, province, and particularly country. The greater the number of genera, species and habitats and ecosystems present within these units, the greater is the Biodiversity. It is in this background that the biodiversity of the area is discussed below:

4.2.6 Forestry (Flora)

Since the project site is situated in the semi-urban region of District Rawalpindi therefore, there is no likelihood of any forest or any type of flora worth mentioning around the project.

Plantation, grasses and shrubs along road, rail, and canal and river side exist. Tree species found in the project area include Shisham (DalbergiaSisoo), Alustonia, Neem (AzaddrachtaIndica), Keekar (Acacia Nilotica), Bottle Palm and Rubber Plant (FicusElastica). Additionally, the Bar jungle has almost disappeared owing to colonization and extension of canal irrigation. Karil (Capparis aphylla) is commonly met with but is no-where bigger than shrub. Jand a much-prized tree for its firewood and charcoal is becoming a Varity. Van which has also become rare is kept for its shade. Shisham Kikar along canal banks has developed into fine big trees. There is no locality without a rich growth of trees mainly Piple, Bohar, Eucalyptus, Popular and Sharin. However, the execution of the project does not involve cutting of the trees.

Main Fruits

The commonly occurring main fruits of the area are Mango, Apple, Plums, Apricot, Grapes, Banana, Citrus, Guava and Peach.

Crops

Rice; Maize and Sugarcane are the major crops being grown during the kharif (summer) and Wheat; Gram; Barley and Rabi Fodder are the major crops being grown during the rabi (winter) seasons.

Vegetables

The commonly available vegetables of the area are: Carrots, radish, ladyfinger, cauliflower, cabbage, turnip, red and green chilli, spinach, peas, pumpkins, bitter gold, and tomatoes.

4.2.7 Wildlife (Fauna)

The project is to be sited within the semi-urban area of Rawalpindi District; therefore, there is no likelihood of any wildlife, game reserves or else around the project site. On very limited scale the following native birds like sparrows, pigeons, crows, doves, rats, lizards, snakes, etc., are found here and there, like in all Punjab.

4.2.8 Fisheries and Aquatic Biology

The project site is in the semi-urban setting which is far away from rivers. Swan River, Haro River and Jehlum River are some of the major rivers that flow in the district. The fish production has been increasing day by day in the district which is playing a vital role in the economy of the country. However, there are no worth mentioning sources of fishery in the form of fresh water fishery or fishing ponds or else in the area of influence of the project.

4.3 SOCIOECONOMIC ENVIRONMENT

4.3.1 Population & Communities:

The project lies in the Tehsil Murree of District Rawalpindi. According to District Census Report (DCR) of Rawalpindi, 1998, the total population of Tehsil Murree was 176,426 as enumerated in March, 1998 with an intercensal percentage increase of 0.68 since March, 1981 when it was 157,136 souls. The average growth rate was 1.56 percent during this period. The total areas of Tehsil are 434 square kilometers which gives population density of 406.5.

A large number of people in the area belong to the poor segment of the society. A segment of the people belongs to middle class, while there are a fairly large number of the people who live below the poverty line. Awareness about importance of education is growing and the same is reflected by the large number of students in educational institutes within the city and in other cities of learning. Easy access to print and electronic media are also playing great role in modifying life style. Most of the population belongs to villages. With this background and large cross section of the urban population still stick to social customs of the old past. Old traditional life style is being followed in almost all walks of life. Elders belong to respected group and they play vital role in decision making. Most of the old generation is uneducated. Old customs are loved and practiced. Arranged marriages are liked and they are quite successful. Joint family system prevails. The people especially in villages are very hospitable.

The field surveys have shown that the settlement pattern of the project area and its vicinity is mostly semi-urban with some partially urban settlements exist in the close vicinity of the project site. The urban population was 21,375 or 12.1 percent of the

total population of the Tehsil Murree. Similarly, the rural population was 155,051 or 87.9 percent of the total population. The population located in the project area is divided in main caste groups, such as Abbasi, Rehmani, Gujjar, Jatt etc. The field survey (including interviews, focus group discussions, census, and village profile) was carried out to collect the socioeconomic data from the project affected people as well as other general population to accomplish the baseline information, which will provide the basis for subsequent monitoring and evaluation studies.

The demographic features include the information on household's profile, gender composition, occupations, and literacy status of the population residing in the project area. The information relating to the demographic profile of the people in the project area are described below.

Family Size and Gender Composition

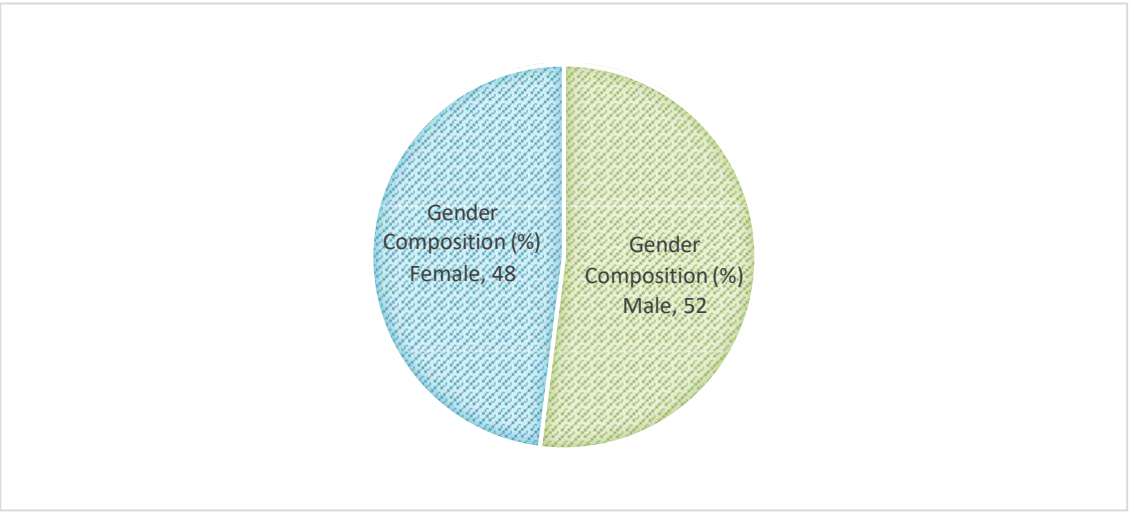
Based on the field survey of sample affected people/ local population, the average family size computed to be 6.2, out of which the proportion of male and female members is 52.0% & 48.0 % respectively as shown in Table 4.6 and Figure 4.7.

Table 4.6: Average Family Size & Gender Composition

Average family Size (No.)		
Gender Composition (%)	Male	Female
6.2	52.0	41.0

Source: Pakistan Bureau of Statistic

Figure 4.7: Gender Composition

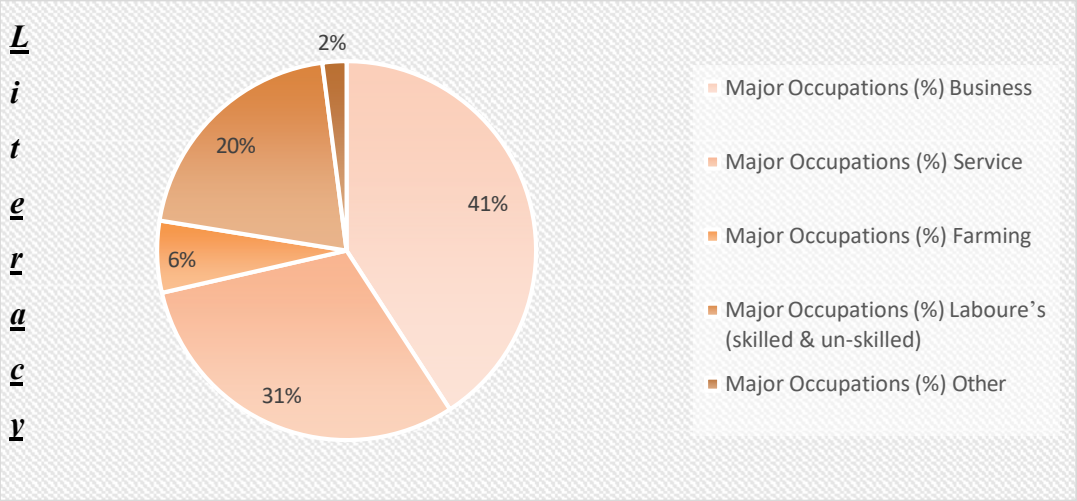


In the vicinity of the project area, the sample populations are involved in different occupations in order to meet their living expenditure. Out of total sample population, 50.8 percent are involved in self business-like shops/ stores, while 29.6 percent are employed in various services. About 5.12 percent population is involved in farming activities. The percent of labor both skilled and un-skilled of the area is 10.41, while 5.05 percent are daily-wage laborers and others respectively. Table 4.7 and Figure 4.8 shows the major occupations of the sample population resided in vicinity of the project area.

Table 4.7: Major Occupations of the Sample Population

Major Occupations (%)				
Business	Service	Farming	Laboure's (skilled & un-skilled)	Other
40.82	30.60	6.12	20.41	2.05

Figure 4.8: Major Occupations of Sample Population



Status

There is two college in the vicinity of the project site area namely Lawrence college and Cadet College Murree. The general disparity in education exists in low-income communities.

The field survey has shown that on the whole, in the vicinity of the project site, the average literacy rate of the local population estimated as 61.98%. The percentage of literacy rate among males and females residing in the vicinity of the project area is computed to be 68.53% and 52.55% respectively. The literacy rate of male and female population in project vicinity, urban and rural area is shown in table 4.8 and educational institute present nearby is shown in table 4.9.

Table 4.8: Average Literacy Rate of the Sample Households

Literacy rate	Male	Female

Project vicinity	68.53%	52.55%
Urban	60.41%	39.59%
Rural	80.67%	19.33%
Overall District	65.8%	34.2%

Note: This is the average literacy rate of population resided in the vicinity of project site.

Table 4.9: Educational Institutes nearby Project Area

School Name	Location	Distance from Project Site
Lawrence College Murree	Murree	~4km
Cadet College Murree	Murree	~7km

Average Household Expenditure

The annual expenditure and pattern of expenditure provides an indication for assessing standard of living of a household. The expenditure on food items includes cereals, pulses, flour, sugar, cooking oil/ ghee, milk etc., while the non-food items including the expenditure on education, medical treatment, clothes, shoes, cosmetics.

The proportion of expenditure incurred on food and non-food items is 70% and 30% respectively.

4.3.2 Industries

The project area is not so far developed in industrial terms. The project site is located in an area where no major industries are present.

However, Murree is economically heavily dependent on tourism. Due to its geographical proximity to Islamabad , capital of Pakistan , Murree is one of the most visited places in the northern mountainous region of the country. Hotels and private apartments etc. is largely growing industry in Murree including Pearl Continental which is a five-star hotel and a nine-hole golf course.

4.3.3 Infrastructure

During the field survey, the availability/ or access to basic infrastructure/ services to the local population was recorded. In this context, it was observed that on the whole, all basic infrastructure/ facilities, i.e. education & health facilities, electricity, telephone/ cell, roads, fuel/ filling station etc. were available to almost all the 96% population resided in the vicinity of the project area.

The area is supplied electricity from the National Grid of Water and Power Development Authority. Almost all the bigger villages are connected through roads

and ultimately to Murree-Islamabad Expressway. Even small connecting roads are available. Variety of private road transport in the form of cabs, wagons are available to reasonable extent.

4.3.4 Transportation: Roads, Rails, Airports, Navigable Rivers

Project site is easily accessible with Murree-Islamabad Expressway. Project site is less than 1 km away from N-75 expressway.

Nearest Railway station from project site is Rawalpindi Railway Station located at distance of about 50.4 km. New Islamabad International Airport is located at distance of about 55.9 km from project site. Rawalpindi is surrounded by Indus River, Korang River and Soan River. Map highlighting the transport network and irrigation channels of District Rawalpindi is presented as Figure 4.9.

4.3.5 Agriculture & Mineral Development

In Murree, agriculture depends entirely on rainfall and at some places on the mountain streams. People living there generally have extremely small land holdings maize is the staple Kharif crop, potato cultivation has also made considerable progress. In areas where water from the hills is available, vegetable are also grown. In the higher regions of Murree and Kotli Sattian apple trees and other fruit trees like pears, plumps, peaches are also grown. The area under fruit orchards is increasing every year. The walnut (Akhrot) is also common. The main rabi crops are wheat and barley, while maize and Bajra arc grown as Kharif crops.

Due to unfavorable conditions for agriculture, people of this District do not take interest in crop husbandry. The cultivators generally content themselves with sowing the seeds after shallow ploughing and bare rest to nature. The use of latest agriculture implements and fertilizers is not common except for cash crops like potato and orchards.

Punjab is also a mineral rich province with extensive mineral deposits of Coal, Iron, Gas, Petrol, Rock salt (with the second largest salt mine in the world), Dolomite, Gypsum, and Silica-sand. The Punjab Mineral Development Corporation is running over a hundred economically viable projects. Manufacturing includes machine products, cement, plastics, and various other goods.

4.3.6 Public Health

Due to good weather condition in the district, health of the population is generally better. Most of the people live in villages and they have better health than people living in urban areas. Small scale dispensaries are available at some villages of the

area. However, at Tehsil Murree better health facilities are available to public. A Tehsil Head Quarter Hospital is located at Guldana Road also caters for medical needs of the people of the area. By and large medical/ health facilities are not adequate.

4.3.7 Recreational Resources & Development

Different types of outdoor recreational facilities in Murree include the most famous sozo adventure park situated in lower topa Murree, Bagh-e-shaheedan, Valley Park, Kashmir point, Chattar park and PIA park. No worth mentioning recreational site except natural scenic beauty within the limit of project area as well as in the vicinity of the project area was noted during the field survey. Thus, there would not have any impact on the recreational activities of the local population/ community due to the implementation of this project.

4.3.8 Cultural & Aesthetic Values

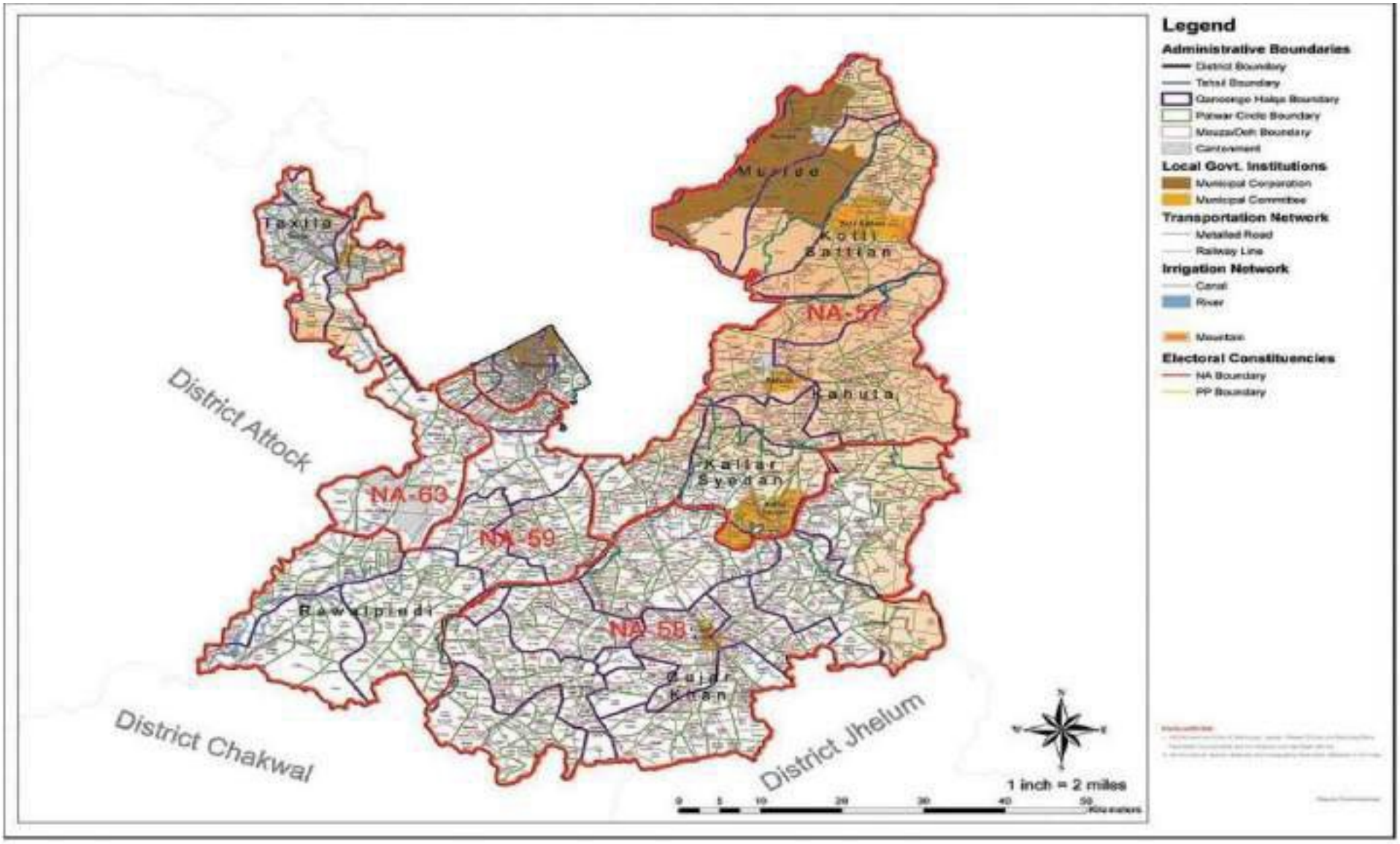
There is no worth mentioning cultural or other heritage around. Pahari is the local language of Murree. Urdu is the principal spoken language of the city and also most commonly used for official purpose. Pahari language is spoken by the ethnic pahari people who form main part of the population in the city. People typically wear warm clothes with dark and bright colors because of their tradition. The people of Murree can be seen in their traditional dresses like shalwar kameez, shawls and frocks with traditional caps. Religious harmony is also a major character of these communities. The semi-urban set up in the area may have a diversified impact on the socio-economic environment of the area.

4.3.9 Site Suitability

During the field survey of the project area, no indigenous people, affected women headed households and environmentally sensitive spot were observed in the project area as well as in the vicinity of the project area. Thus, there would not have any impact on the indigenous people and women headed households' due to the implementation of this project.

Environmentally speaking, the carrying capacity of the environment is not utilized. The project activity, under the proposed strict operational environmental controls, is not going to leave adverse impacts on all out environment.

Figure 4.9: Map of Transport Network & Irrigation Channels, Rawalpindi



4.4 BASELINE ENVIRONMENTAL QUALITY

4.4.1 Ambient Air Quality

The degradation of air quality in all the large cities is a major environmental concern these days. Air pollution levels in urban centers have either crossed safe limits given in the PEQS or have reached the threshold values. About 60 to 70 % of the deterioration in the air quality is due to the vehicular emissions. The parameters which have proved to be the major threat are particulate matter and concentration of oxides of nitrogen that are relatively higher in all the large cities of Punjab.

The proposed project area is mostly semi-urban area. Vehicular traffic is the major contributor for environmental pollution. The project sections pass through barely built-up area with residential, commercial and institutional establishments. The ambient air quality data with respect to PM (PM_{10}), SO_x, NO_x and CO was measured at specified sites. The data was collected during the month of July, 2021 by APEX Environment Laboratory Lahore. Standard methods of environmental monitoring were used for sampling and data analysis.

The result of the tests concludes that the values obtained for all of tested parameters are within permissible limits illustrated in tables below. Air Quality test report has been attached as **Annexure-IX** of this report.

Table 4.10: Monitoring results of PM at project site

Reference Point	PM (µg/m^3)
Eastern side of the proposed project site	45.73
Western side of the proposed project site	50.52
Northern side of the proposed project site	64.82
Southern side of the proposed project site	45.37
Centre side of the proposed project site	70.45
Punjab Ambient Air Quality Standards (PAAQS)	**500.0**

Table 4.11: Monitoring results of Ambient Gases at project site

Reference Point	SO_2 (µg/m^3)	NO_2 (µg/m^3)	CO (mg/m^3)
Eastern side of the proposed project site	25.9	42.8	0.24
Western side of the proposed project site	47.5	36.4	0.19
Northern side of the proposed project site	24.6	34.9	0.30
Southern side of the proposed project site	30.7	32.8	0.39

Centre side of the proposed project site	14.9	19.2	0.29
Punjab Ambient Air Quality Standards (PAAQS)	**120.0**	**80.0**	**5.0**

4.4.2 Ambient Noise Levels

Noise is generally used as an unwanted sound, or sound which produces unpleasant effects and discomfort on the ears. Noise is considered as environmental pollution, even though it is thought to have less damage on humans than water, air or land pollution. Generally, problems caused by noise pollution include stress, hearing loss, sleep disruption etc. During the construction phase of this scheme, noise can be generated from machinery used. Traffic movement in area is considered to be the major cause of noise pollution. The noise levels were monitored during day-time by APEX Environment Laboratory during month of November, 2020 noise levels were monitored with Noise Level Meter, Model OS-11.

On comparison of noise quality data with the limits specified for in ambient noise quality standards; it is evident that noise values at almost all sites are within permissible limits as presented in table below. Noise Quality test report has been attached as **Annexure-X** of this report

Table 4.12: Day time Monitoring results of Noise at project site

Reference Point	Min. dB(A)	Max. dB(A)
Eastern side of the proposed Project site	47.2	49.8
Western side of the proposed Project site	48.5	49.7
Northern side of the proposed Project site	45.4	46.2
Southern side of the proposed Project site	48.1	49.5
Centre side of the proposed Project site	48.6	50.2

4.4.3 Water Quality

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is commonly compared with a set of standards against which compliance can be assessed.

The water resource in the study area includes groundwater. The groundwater is extracted by means of wells, hand pumps and electric motors. All of tested parameters for drinking water quality are within permissible limits as shown in table below. The results of the water quality test reports have been attached as **Annexure-XI** of this report.

Table 4.13: Monitoring results of Groundwater at project site

Sr.#	Parameter	Unit	Result	PEQS
1	pH	--	7.2	6.5-8.5
2	Conductivity	Us/cm	738	NGVS
3	Iron	Mg/l	0.6	0.3
4	Total Dissolved Solids (TDS)	Mg/l	333	<1000
5	Chloride	Mg/l	43	<250
6	Total Hardness as $CaCO_3$	mg/l	208	<500
7	Calcium	mg/l	125	NGVS
8	Turbidity	ntu	0.21	<5 NTU
9	Fluoride	mg/l	0.25	≤1.5
10	Nitrate (NO_3)	mg/l	0.08	≤50
11	Nitrite(NO_2)	mg/l	0.26	≤3
12	Manganese	mg/l	BDL	≤0.5
13	Zinc	mg/l	BDL	5
14	Arsenic	mg/l	0.015	≤0.05
15	Copper(Cu)	mg/l	BDL	2
16	Chromium	mg/l	BDL	≤0.05
17	Potassium	mg/l	BDL	N.S

CHAPTER-5

PUBLIC CONSULTATION

5.1 GENERAL

This section deals with the public concerns about the said project. As already given in the previous sections, the said project is about Development and Construction of huts under the name of Construction of huts & commercial building.

Consultation with stakeholders is a tool for managing two-way communication between the project sponsor and the public. Its goal is to improve decision making and build understanding by actively involving individuals, groups and organizations which have a stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholder.

Consultation with the community and their active participation plays a vital role in successful implementation of the development projects. To identify the different types of stakeholders and ascertain their perception about the project, an impact assessment survey was conducted by keeping in view the requirement of *'Review of IEE/ EIA Regulations 2000'*. Stakeholders were consulted with the help of structured/ semi-structured tools. Informal group discussions were also held as an additional tool for obtaining feedback that are being discussed on the following pages.

Public consultations were carried out keeping in view the following main objectives:

- Sharing of information with stakeholders/ public on the proposed project activities and assess expected impacts.
- Understanding the stakeholder's concerns regarding the various aspects of the project, including the project technology, existing situation and the potential impacts of the project during construction and operational phase of the project.

The forums mentioned in subsequent sections were consulted. Written views and observations with particulars of people, environmental experts, and officials consulted is described comprehensively in table 5.1 and the proformas filled during consultation by all stated forums is appended as **Annexure-XII** of this document.

5.2 PROPONENTS' ENVIRONMENT MANAGEMENT TEAM

As stated in earlier sections, project is in its planning phase. Once the project comes in its construction phase, a team with representatives from key management functions will be developed to assess issues, aspects, opportunities and existing manufacturing process w.r.t environment. Therefore, it is too early to substantiate the stated inscription.

5.3 THE RESPONSIBLE AUTHORITY

Proponent is responsible for the environmental impacts of this project and has taken

commitment to implement the mitigation measures proposed in the Environmental Management Plan with subsequent review and approval conditions. Proponent ensured to use all practicable means consistent with other essential considerations to protect and preserve environmental quality.

5.4 OTHER DEPARTMENT & AGENCIES

About 4 people from different governmental departments such as Civil defense, RDA, PHA and Agricultural consulted for proposed project. The environmental concerns and suggestions made by the officials were listed out, discussed and suggestions were accordingly mentioned in the table 5.1.

5.5 ENVIRONMENTAL PRACTITIONERS & EXPERTS

The Environmental Experts has been informed with briefing on project interventions including its benefits. All of consulted experts asked questions to get information about different components of project. About 3 experts were consulted and their recommendations have been mentioned in table 5.1.

1. Adeel Pervaiz Sr. Manager Landfill LWMC
2. Dr. Fariha Arooj. Assistant Professor UVAS
3. Dr. Mujtaba Baqir. Lecturer GCU

5.6 AFFECTED & WIDER COMMUNITY

The people of the project area are pro project installation. They are of the view that the project will enhance the economic benefits. About 30 persons were consulted during the public survey and majority of people consulted were of view that this project will provide employment opportunity to locals of the area. They focused on a point to encourage such projects in order to increase economic development as well as to improve living standards of area. At the same time, they foresee that project management will feel their social, moral and legal obligation and bring in Environment Management Order whereby environment will not be tempered as mentioned in table 5.1.

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Table 5.1: List of participants during stakeholder consultations & concerns

Sr.#	Date	Location/ Venue/ Address	Particulars of Participants	Feedback/ Concerns
Official Consultations				
1.	16-07-2025	Rawalpindi Development Authority, R.W.P.	Mr. Sadoon Basra [AD Engineering, RDA]	- It's a good initiative for economy empowerment of the area. This project augments jobs opportunity and security of the area. - Be ensuring during the development of project no harm to flora, fauna and no tree cutting involved.
2.	16-07-2025	Director General Agricultural (Field) Murree Rd., R.W.P.	Mr. Khalid Mahmood [Dy. Director Agriculture]	- Stated project shall not affect irrigation channels or stream. Agricultural land shall be protected to its intent rather using it for industrial purposes; as far as this could be considered.
3.	16-07-2025	Parks and Horticulture Authority, Islamabad	Mr. Faisal Ahmed [Assistant Director]	- Every new project must be planned with tasteful landscaping as living within aesthetically pleasing environment. New societies should promote tree planation as its enhanced scenery and protect from floods.
4.	16-07-2025	Punjab Fisheries Department Rawal Town near Rawal Chowk	Mr. M. Iftikhar [Dy. Director, Fisheries]	- Stated project shall not disrupt aquatic natural ecosystem (if any nearby). So we have no objection in the commencement of this project.
Environmental Experts				
5.	14-07-2025	Environmental Expert	Mr. Adeel Perviz	- No construction, preliminary or otherwise relating to the project shall be started until and unless the Environmental Approval has been issued by EPA.
6.	14-07-2025	UVAS, Data Ganj Bakhsh Town, Lahore	Dr. Fariha Arooj [Assis. Prof UVAS]	- The environmental reports must be available for better understanding to comment. - All mitigation measures must ensure by proponent while development of this project.
7.	14-07-2025	Govt. College University Lahore	Dr. Mujtaba Baqir [Lecturer, GCU]	- As Murree is declared as sensitive area, development projects must be supervised by proponent and concerned department.

				- Solid Waste should be handled properly on daily basis and proper drainage system for waste water must be designed keeping in view heavy rainfall.
Public Consultation				
1.	15-07-2025	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Rameez Abbasi [Property Dealer]	- As per description this seems to be good project & it is requested to provide maximum jobs to local community.
2.	15-07-2025	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Sajid [Labor]	- I have no issue on this project. It will provide opportunities for local residence.
3.	15-07-2025	Abbasi Muhala Shawala Murree	Mr. Adeel Abbasi [Sanitary worker]	- In order to support the underprivileged of locals, labour/ jobs must be provided to common people.
4.	15-07-2025	Ihata Noor Khan Tehsil Murree Dist. Rawalpindi	Mr. Saeed [Salesperson]	- No issues regarding the project except request for cleanliness of the area.
5.	15-07-2025	Village Kohi District Rwp.	Mr. Shamraiz [Local seller]	- Stated project is helpful to provide the employment opportunities and managing the life better.
6.	15-07-2025	Ihata Noor Khan	Mr. Usman [Security Guard]	- This factor has employed many locals and facilitating many local families.
7.	15-07-2025	Ihata Noor Khan	Mr. Naveed [Shopkeeper]	- Look as if good project and such project must be encouraged for increased opportunities of employment
8.	15-07-2025	Gorakhpur Village, PO Dahgal, Adyala Rd., R.W.P.	Mr. Waleed [Horse ride service provider]	- Its good project regarding provision of jobs.
9.	15-07-2025	Ihata Noor Khan	Mr. Awais [worker]	- It is requested to take care of cleanliness of area and have no issues regarding project.
10.	15-07-2025	Village Kohi District Rwp.	Mr. Fazil [shopkeeper]	- It's a good initiative for better of environment.
11.	15-07-2025	Ihata Noor Khan	Mr. Javeed [Shopkeeper]	- Seems upright project for job opportunities.
12.	15-07-2025	Village Kohi District Rwp.	Mr. Toqueer [Automobile Workshop]	- I have no issue on this project. Plots should be in range so that poor people can afford.
13.	15-07-2025	Ihata Noor Khan	Mr. Waheed [Student]	- As population of the country increasing day by day so such projects will provide good life style.

14.	15-07-2025	Village Kohi District Rwp.	Mr. Farhan [Worker in Petrol pump]	- I have no objection on this project.
15.	15-07-2025	Ihata Noor Khan	Mr.Noman Abbasi [Business Man]	- To meet the demands of residence such societies are ideal project. People demand better life style is these days. No issues regarding stated project.
16.	15-07-2025	Ihata Noor Khan	Mr. M. Javaid [Hotel Owner]	- This is a good project in area and no issues regarding project.
17.	15-07-2025	Mussyari Village R.W.P.	Mr. Gulzar [Shopkeeper]	- No issues regarding stated project. Its will provide many jobs to locals.
18.	15-07-2025	Ihata Noor Khan	Mr. Pervaiz Abbasi [Peon]	- Must ensure cleaning of the area. I have no issue on the development of the project.
19.	15-07-2025	Village Kohi District Rwp.	Mr. Arshad Mehmood [Worker]	- We don't have any kind of offence regarding the housing society.
20.	15-07-2025	Mussyari Village R.W.P.	Mr. Bilal Qasim [No work]	- Two other societies with uplift living standard also developing here. It will increase the beauty of the area.
21.	15-07-2025	Ihata Noor Khan	Ms. Ijaz Abbasi [Student]	- Near locality of society will benefit by attaining employed.
22.	15-07-2025	Ihata Noor Khan	Mr. Raja Hafeez [Shopkeeper]	- There isn't any kind of issue or problem due to society.
23.	15-07-2025	Adyala Road Murree	Mr. Umer Khan [Private Job]	- It's a good opportunity for having job during development. Many worker of different sector will get jobs.
24.	15-07-2025	Mussyari Village R.W.P.	Mr. Adeel Ahmad [Shopkeeper]	- I have no objection on the development of this project. .
25.	15-07-2025	Gorakhpur, Adyala Rd., R.W.P.	Mr. Nabil Qazi [property dealer]	- This society will benefit the locals with engaging local peoples of the area.
26.	15-07-2025	Ihata Noor Khan	Mr. Ahsan [business man]	- This area is better for living and if residency is lavish than it's a plus point for the people.
27.	15-07-2025	Gorakhpur, Adyala Rd., R.W.P.	Mr. M. Qasim [Business]	- Waste generated by society must be collected on regular basis.
28.	15-07-2025	Ihata Noor Khan	Mr. Abdullah	- There is decent trend setting up due to appartments. I

			[Shopkeeper]	have no problem on this project.
29.	15-07-2025	Mussyari Village R.W.P.	Mr. Akhtar [Business man]	- There isn't any problem to us or nearby due to this project.
30.	15-07-2025	Mussyari Village R.W.P.	Mrs. Adeel Sajid [Worker]	- I think no problem will generate to the local community.

CHAPTER-6

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

6.1 GENERAL

The potential environmental impacts have been studied related to design, location, construction and operational stages of the proposed project. Environmental protection measures are recommended to eliminate adverse environmental impacts or to reduce them to an acceptable level within the prevailing legislative and regulatory framework.

6.2 IMPACT ANALYSIS

Potential Environmental impacts associated with proposed study has been analyzed by a process wherein a group of experienced people with relevant experience were involved for identifying potential safety and operational problems associated with the design, maintenance or operation of a proposed project. They assessed different parts/ components of proposed project in critical view to environmental protection. Proposed project has been evaluated laterally and collectively about what impacts might be expected to arise with the proposed project. Impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

- Magnitude
  - Type of impact (direct, indirect, cumulative)
- Immediacy
  - Temporal extent (during construction, after construction)
  - Spatial extent (local, widespread)
- Sustainability and Reversibility
  - Mitigability (fully, partially)
  - Monitoring (fully, partially)

Furthermore, ***consultative meetings*** were held for impact analysis with EIA team members and proponent of the project. Risk rating factors were the main agenda of these meetings for each environmental inventory element. Final outputs are presented in following sections below.

6.3 METHODOLOGY FOR IMPACT IDENTIFICATION

Screening of the potential impacts associated with the proposed project activities was carried out with help of Checklist and Leopold Matrix methods specifically tailored for this project.

6.3.1 Checklist

This lists significant environmental effects known to have occurred in past relevant development projects. This is arranged to permit (i) ready screening out of non-pertinent items by checking the column 'No significant effects' and (ii) ready grading of significant environmental effects by degree of effect. The checklist presented as Table 6.1 shows checklist of environmental parameters & its consequences for Construction of huts & commercial building on khewat no. 09, khatooni no. 18, khasra no. 593, charhan, tehsil Murree, district Rawalpindi.

6.3.2 Leopold Matrix

With the help of this matrix, interaction of various project activities with various components/aspects of the environment was identified. This interaction was then categorized with respect to its severity of impacts, as follows:

- Low : L
- Medium: M
- High: H
- Positive Impact: P
- No Impact: N

With the help of the above ranking, less important/ severe impacts were screened out from the ones which were more important, needing further discussion as presented in table 6.2.

6.4 IMPACT CHARACTERIZATION

Subsequent to the impact screening, various characteristics of the potential impacts including spatial extent (local, regional, global), nature (direct/indirect), temporal extent (temporary, permanent), reversibility, severity, sensitivity of receptors and significance of impacts were determined.

Impacts characterization associated to project activities/ operational phase and their explanation is presented in table 6.3.

Table 6.1: Checklist for Environmental Consequences

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
1) Earth Resources							
1.1	Excavation and leveling	✓				Minor	Excavation of insignificant level will be carried out for the basement of proposed retail outlet.
Geological hazards							
	Faults		✓				The building structure will be designed to withstand the seismic action (load) without local or general collapse.
	Landslides			✓			Proposed project area comprising on hard rock. There are no chances of land sliding as other societies' are also existing.
	Un-engineered fill			✓			
1.2	Earthquake consideration	✓				Minor	The proposed structure will be designed to withstand seismic loads in accordance with the Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007 to ensure the safety of the building during such an event. The significance of this impact is minor as the proposed building will be constructed as per the applicable building code for Rawalpindi and adjoining areas
1.3	Contaminated soils		✓				Possibility of soil contamination due to oil spills from generators, vehicle workshops, and accidental spills. The chances of soil contamination are close to negligible.
1.4	Contaminated surface or groundwater		✓				The chances of groundwater contamination are close to negligible as the proposed site is an area where no major activity generating excessive effluent exists.
1.5	Borrow pits		✓				Borrow pits (if any), will be restored after completion of the construction activities.
1.6	Loss of high-quality farmlands			✓			Proposed project area is declared as residential area. Half area of the proposed project is open land with tree and grass.
1.7	Site drainage	✓				Minor	A surface drainage system will be designed to cater the needs of the project site.
2) Air Quality							
Substantial increase in onsite air pollutant emission-construction phase							
	Dust emissions during construction	✓				Moderate	Dust emissions during construction will be mitigated by applying

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
2.1	activities						measures as per EMP.
	Emissions from vehicles and machinery		✓			Minor	Emissions from vehicles and machinery used during the construction phase will be mitigated by adoption of measures as presented in EMP.
	Substantial increase in odor during construction		✓				Paint, polishing, pesticide spray would produce odor. Safe Use Action Plan will be implemented and further impacts will be mitigated by using proper mitigation measures as per EMP.
Substantial increase in onsite air pollutant emission-operation phase							
2.2	Emissions from generators		✓				Proposed project activity would involve use of generator of 25 kVA capacity during load-shedding hours. Therefore, proper mitigation measures for use of generator would be adopted as per EMP to avoid deterioration of air quality.
	Increase in odor			✓			
	Violation of applicable air pollutant emissions or ambient concentration standards	✓					To limit air emissions from proposed facility, it must be properly operated and carefully maintained.
	Consideration of indoor air quality	✓					apartments will be designed according to the RDA rules and regulation. There must be proper ventilation.
3) Water Resources and Quality							
3.1	River, stream or lake onsite or around the project site			✓			
3.2	Provision of safe drinking water during operational phase				✓		Water needs will be fulfilled by groundwater which is found safe for drinking after monitoring results appended as **Annexure-XI.**
3.3	Presence of any wetland of national importance (like game reserve, wildlife sanctuary etc.) or international significance (like Ramsar site etc) located within or around the proposed project site			✓			
3.4	Discharges to surface or groundwater			✓			
3.5	Onsite bulk storage of liquid fuels or hazardous materials.		✓				Minor quantity of daily usage fuel, paints etc. may be stored on padded floor with impermeable lining or as per regulated SOPs.
3.6	Site Drainage.			✓			The sewerage from the proposed facility will be disposed off after due treatment in proposed 3 stage septic tanks. Small diameter sewer line

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
							collecting the sewage flow from the proposed center will be combined with the external nearby sewer drain at an appropriate point keeping in view the diameter and invert level etc.
4) Cultural resources							
4.1	Pre-hisotric, historic or paleontological resources within or around the proposed construction site.			✓			
4.2	Any gazetted or notified archaeological site located within or around the project site			✓			
4.3	Any cultural, religious site located around the project site.			✓			
4.4	Site/ facility with unique cultural or ethnic values.			✓			
5) Biological resources							
5.1	Vegetation removal			✓			Proposed project does not involve any vegetation removal/ tree cutting. 3-5 trees coming in premises of project which will be preserved.
5.2	Construction in wetlands or riparian areas			✓			
5.3	Use of pesticide/ rodenticide/ insecticide	✓				Minor	Anti-termite treatment will be used according to Regulation 22 CFR 216.3 (b) (a through l). Only registered pesticide from USEPA will be used. Proper safety measures including use of Personal Protective Equipment (PPE) will be ensured. Selection, storage and application of pesticide will be recommended as per 2011 Pakistan Programmatic Umbrella PERSUAP.
5.4	Protected areas (wildlife sanctuary, national park) or within game reserve declared by provincial wildlife Ordinances/ Laws			✓			
5.5	Any rare, threatened or vulnerable wildlife or vegetation specie observed/reported in or near project site			✓			
5.6	Presence of core habitat for any key			✓			

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
	wildlife species, within or in close vicinity of project site (e.g, path of migratory birds)						
6) Planning and Land Use							
6.1	Potential conflict with adjacent land uses			✓			
6.2	Non-compliance with existing codes, plans, permits or design criteria			✓			
6.3	Potential impact on adjacent buildings due to construction of existing structures			✓			
6.4	Construction in public park or designated recreational areas			✓			
6.5	Create substantially annoying source of light or glare			✓			
6.6	Relocation of > 10 individuals for +6 months			✓			
6.7	Interrupt necessary utility or municipal services for more than 10 individuals for +6 months			✓			
6.8	Substantial loss/ inefficient use of mineral or nonrenewable resources			✓			
6.9	Increase in existing noise levels	✓					Noise will be generated during construction/ operational activities. To minimize the noise impact proper mitigation measures will be adopted as per EMP.
6.10	Non-compliance with building codes (structure failure)			✓			
7) Traffic, Transportation and Circulation							
7.1	Increase vehicle load or congestion on existing roads		✓				Main Murree-Islamabad expressway Road can bear load upto double excel truck however; restoration of any damage to road shall be paid by project proponent.
7.2	Onsite congestion due to fuel transporting vehicles.			✓			No.
8) Hazards, Workers Safety							

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
8.1	Substantially increase risk of fire, explosion, or hazardous chemical/ fuel/ petrol spill or leakages		✓				Any potential increase in risk of fire, explosion, or hazardous chemical/ fuel/ petrol release will be minimized onsite for handling any emergency situations as mentioned in EMP.
8.2	Accidents or human health hazard		✓				Risks of accidents and human health hazards will be avoided by putting caution signs and use of PPE during work hours as mentioned in EMP.
8.3	Workers safety	✓				Minor	Safety procedures will be ensured during construction, electrical installations and operational activities.
9) Hazardous waste							
9.1	Increase quantity of heavy metals			✓			
9.2	Bulk quantities of hazardous materials or fuel storage			✓			
9.3	Increase in hazardous waste		✓			Minor	All hazardous waste needs to be disposed properly via suitable disposal option.
10) Non-Hazardous waste							
10.1	Construction waste/ Municipal waste	✓				Minor	Impacts from construction/ municipal waste will be mitigated according to measures mentioned in EMP.
10.2	solid waste management	✓				Minor	Solid waste will be managed as per EMP.
11) Electrical and Mechanical Installations and Fixtures							
11.1	Presence of Halons, HCFC's in HVAC systems, refrigeration equipment and fire suppression equipment.			✓			
11.2	Presence of PCBs in electrical equipment.		✓				Electrical equipments free from PCBs must be installed.
11.3	Safety issues for using low quality cables and appliances.			✓			
12) Paints							
12.1	Presence of Lead and arsenic or any other banned chemical in the paints.		✓				Some paints may contain toxic substances such as arsenic[4]. Such paints will not be allowed to use.
13) Spills/ Leakages							
13.1	Leakages from generators & boiler		✓				Regular monitoring is required to prevent any leakages.

[4] TECHNICAL BULLETIN HEALTH EFFECTS INFORMATION; Oregon Department of Human Services, http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Monitoring/Documents/health/arsenic.pdf

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
13.2	Leakages from vehicles and fuel storage tanks			✓			
13.3	Petrol spills/ leakages		✓				Project management will apply strict rules on his workers and labor to ensure that no spill or leakages are caused. If spills/ leakages occur, it should be managed as per measures suggested in EMP.
14)	**Result**						
14.1	Substantial adverse impact			✓			
14.2	Adverse impact			✓			
14.3	Minimal impact	✓					Overall the project will have minimal impact.

Notes:
Y*: Yes, M*: May be, N*: No, B*: Beneficial
** Impacts: Minor, Moderate, Major

Table 6.2: Leopold Matrix – Impacts for Construction of proposed project.

Environmental component / Project Component	PHYSICAL ENVIRONMENT										BIOLOGICAL ENVIRONMENT									SOICAL ENVIRONMENT							
	Climate	Geology	Seismicity	Soils contamination	Land use	Surface Water	Groundwater	Air Quality	Slope Failure	Noise	Aquatic Ecosystem	Wetland Ecosystem	Trees	Endangered Species (Plants & animals)	Migratory Species	Birds and Animals	Plants	Wildlife	Disease Vectors	Public/ Workers Health	Flow of Road Traffic	Employment	Structures and Infrastructure	Health & Safety hazards	Cultural & Religious Values	Tourism & Recreation	Disruption of Businesses
Location of proposed project	L	N	H	L	L	N	N	N	H	N	N	N	N	N	N	N	N	N	N	N	N	P	N	N	N	P	N
Design phase of proposed project	L	N	H	N	L	N	N	N	H	N	N	N	N	N	N	N	N	N	N	N	N	P	P	N	N	P	N
Construction of Apartments	M	L	H	M	L	N	N	M	H	M	N	N	N	N	N	N	N	N	M	M	L	P	P	M	N	P	N
Operational Phase of project	N	N	M	N	L	N	N	N	M	L	N	N	N	N	N	N	L	N	N	N	N	P	P	N	N	P	N

**Key: P: Positive Impact; N: No Impact; L: Low Impact; M: Medium Impact; H: High Impact*

Table 6.3: Impact Characterization

Environmental Impacts → / Categories ↓	Health & Safety Hazard	Soil Contamination	Water Quality	Air Quality	Explanation
Nature	Direct	Direct	Direct	Direct	**Direct:** The environmental parameters are directly affected by the Project construction or operation. **Indirect:** The environmental parameter changes as a result of alteration in another parameter.
Duration of Impact	Long term	Short term	Short term	Short term	**Short-term:** The impacts that last only during the construction of the proposed Project e.g., noise from the construction activities. **Medium-term:** lasting for a period of few months to a year the project before naturally reverting to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil. **Long term:** lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
Geographical Extent	Local	Local	Local	Local	The geographical extent may be local or regional (spatial dimension)
Project Phases	On going	On going	On going	On going	Pre-construction (designing), Construction and Operational. Impacts are ongoing only during construction phase
Reversibility of impacts	Temporary	Temporary	Temporary	Temporary	**Temporary:** The impacts that don't cross ecosystem threshold value of resilience. **Permanent:** The impacts that exceed ecosystem threshold value of resilience i.e., community that cannot come back to its original stage without external aid.
Likelihood of the Impact	Certain	Likely	Likely	Likely	**Certain:** Impact anticipated occurring under extreme circumstances. **Likely:** Impact will probably occur under less extreme circumstances. **Possibly:** Impact may possibly occur during different stages of the project. **Unlikely:** Impact could occur during many stages of the project. **Rare:** Impact may occur but only under exceptional circumstances.
Impact Consequence Severity	Major	Minor	Minor	Minor	**Major:** When an activity causes irreversible damage to a unique environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on socio-economic activities of significance or regional level. **Moderate:** When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or

					distribution over one generation of a population of flora or fauna; has short-term effects (period of months) on socio-economic activities of significance on regional level. **Minor:** When an activity causes short-term (period of few months) reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term (period of months) effects on socio-economic activities of local significance. **Negligible:** When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.
Significance of Impact	Medium	Low	Low	Low	Impact may be categorized as high, medium, or low. Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with legislative of statutory requirements.

6.5 IMPACT SIGNIFICANCE

Subsequent to screening and characterization, impacts of significant importance are described below:

- Health hazard for staff, workers, and nearby communities caused by not following PPEs, as well as improper construction activities and use of construction equipment and machineries
- Safety hazards caused by various stages of construction activities as well as natural disasters (earthquake, slope failures, landslides etc.)
- Seismic Hazards by natural cause
- Air quality deterioration by use of construction machineries/ vehicle exhaust, dust emissions, odor due to paint, polishing and pesticide spray

These impacts and their mitigation measures are discussed in detail below at each stage of proposed project activities.

Based on the above screening and evaluation process the following determination (check all that apply) is recommended. It is assessed that proposed project has minimal adverse impacts after proper implementation of mitigation measures proposed for each associated activity.

	The activity contains. . .	**(equivalent regulation)**
☐	Very low risk sub-activities	categorical exclusion(s)
☐	After environmental review, sub-activities determined to have **no significant adverse impacts**	negative determination(s)
☑	After environmental review, sub-activities determined to have **no significant adverse impacts, given appropriate mitigation and monitoring.**	negative determination(s) with conditions
☐	After environmental review, sub-activities determined to have **significant adverse impacts**	positive determination(s)

6.6 Mitigation & Impact Assessment

Anticipated Environmental Impacts of proposed project of construction of huts & commercial building on khewat no. 09, khatooni no. 18, khasra no. 593, charhan, tehsil Murree, district Rawalpindi are determined. Upon consequent, relevant mitigatory measures have been suggested and presented in table 6.4 below.

Table 6.4: Mitigation and Impact Assessment

Sr. #	PROJECT ACTIVITY	DESCRIPTION*			MITIGATION MEASURES**
		When	*Where*	*How*	
1. Earth Resources					
1.1.	Excavation & Leveling	»Construction phase	»Proposed Project site	»Excavation will be carried out for the basement of proposed building.	»Excavated soil should be stockpiled at appropriate locations. Adequate enclosures to be provided for such storage, to avoid blowing away by wind and run off with storm water. »Use of security fences or hazard tapes to warn and control the access of unauthorized persons to the excavated site. »Weekly monitoring during excavation & reporting by HSE manager of construction contractor.
1.2.	Earthquake consideration	»Planning/ designing phase	»On site	»The building structure will be designed to withstand the seismic action (load) without local or general collapse. »Significance of Impact is minor	»The design specification will be followed to withstand seismic loads in accordance with the Uniform Building Code (UBC) - 1997 and Building Code of Pakistan (BCP), Seismic Provisions - 2007, as required by local codes and standards for high degree of structural competence, reliability and ease of construction[5]. »It will be executed and managed at planning & design phase by design contractor.
1.3.	Soil contamination	»Construction & Operational Phase	»On site	»Improper handling of construction material by construction workers; »Inadequate handling & disposal of contaminated soil.	»Impart proper training to their workforce in the storage and handling of obnoxious materials that can potentially cause soil contamination by construction contractor. It must be monitored and implemented by HSE manager of construction contractor. »Implement mitigation measures suggested under sub-section 6.9.2 & 6.10.3.
1.4.	Loss of trees/ vegetation	»Construction Phase	»Project site	»No tree cutting is involved in stated project.	»It will be executed by project proponent.
1.5.	Land Use	»Planning, Construction	»On site	»Potential impact on adjacent buildings due to	»The construction contractor must ensures that all structure, equipment, materials and facilities used or created on site

[5] Structural design at present in Pakistan is designed as per UBC-97 and ACI 318-02M because of the local techniques, procedures, technologies and material available for concrete and other construction material. The building Codes BCP, SP-2007, Design of Concrete Structures by Arthur H. Nilson, Design of Reinforced Concrete by M. C. Cormac, Foundation Analysis and Design by J.E. Bowles will also be followed in due course of time upon availability of advanced materials and techniques in Pakistan

			& Operational Phase		construction of proposed facility; it is anticipated to be minor; »Aesthetic value of the area might get impaired.	for/ or during construction activities are removed. »Tree plantation must be encouraged in and around project site for enhanced aesthetics of the area.
2. Air Quality						
2.1.	Dust Emissions		»Construction phase	»On site	»Due to construction activities, dust will be generated.	»Sprinkling of water to suppress dust emissions. »Periodic Environmental monitoring in specific to air quality will be carried out by HSE manager of construction contractor.
2.2.	Emissions from vehicles/ generator stack/ chemical fumes from fuel storage tanks		»Designing, Construction & Operational Phase	»On & Off site	»Vehicles washing, servicing and repairing works onsite »Flue gas emissions from generator & fuel storage tanks if not maintained properly	»Use of properly maintained and tuned vehicles/ equipment/ generators onsite to avoid air and soil pollution. »Properly designed and maintained ventilation as it is one of the more effective ways of reducing exposure to harmful chemicals in the form of fumes. »Implement mitigation measures suggested under sub-section 6.9.5 & 6.10.5. »Periodic Environmental monitoring in specific to air quality will be carried out by HSE manager of construction contractor. »Besides, it will be taken care to operate processes and activities to minimize emission hazardous to health of proposed project by Design Contractor & Project Proponent.
2.3.	Increase in odor		»During operational phase	»On site	»Odor from petrol storage tanks/ fueling or defueling area.	»Proposed facility must be properly ventilated & designed. »It will be executed by construction contractor and ensure compliance to use of PPEs by workers while handling petrol. »HSE manager will monitor use of PPEs by workers on daily basis.
3. Water Quality						
3.1.	Surface/ Ground water Contamination		»Construction & Operational Phase	»On & off site	»Improper sanitation system for construction as well as operational workers.	»Proper sanitary system must be provide to construction workers on temporary bases during construction phase. »The chances of water contamination are close to negligible as no major activity generating excessive effluent exists. »It will be executed by construction contractor during construction phase & project management during operational

					phase. »Implement mitigation measures suggested under sub-sections 6.9.4 & 6.10.4.
4. *Traffic, Transportation, Circulation*					
4.1.	Congestion on existing road	»Construction Phase	»On site	»Traffic jams or congestion on road by the movement of construction/ raw material/ vehicles during the peak traffic hours.	»Traffic jams or congestion on road will be eliminated by avoiding the movement of vehicles during the peak traffic hours »Allocation of proper place for vehicles will be carried out to avoid congestion and haphazard movement of vehicles onsite. »Daily monitoring by HSE manager of construction contractor to ensure pedestrian/ operator's safety and their ability to complete the task without incident.
5. *Solid Waste*					
5.1.	Municipal waste	»Construction & Operational Phase	»On Site	»Garbage produced by workers; »Hideous littering by workers engaged for operational activities.	»Measures should be adopted for safe and environment friendly disposal of all generated solid and liquid wastes. It is recommended that workers must restrict their activities within the project premises. »Orientation trainings will be provided to the workers for identification, segregation & management of solid waste during construction & operational phase. »Weekly monitoring and inspection of waste management related facilities and activities in order to ensure compliance as per applicable rules & regulations by project management. »Maintain records of training.
5.2.	Hazardous waste	»Operational Phase	»On site	»Regular and thorough management of hazardous waste which is absolutely essential for efficient operation.	»Monthly monitoring & inspection of haz. waste management activities directly resulting from executing the project process by project management during operational phase. »Implement mitigation measures suggested under sub-section 6.10.9.
6. Health & Safety					
6.1.	Accidents/ human health hazards	»Construction Phase	»On site	»Construction activities will pose certain negative impacts on workers.	»Ensure safe working practices are observed at all times while carrying out work activities by construction contractor. »All accidents, whether to themselves, others or property must immediately be reported to project management.

					»Site specific HSE Plan must be used as a guide to assist the Contractor working on this project. »HSE manager by Construction Contractor will be responsible for periodic site safety inspections. »Implement mitigation measures suggested under sub-section 6.9.10.
6.2.	Noise/ Vibrations	»Construction Phase	»On site & On duty	»Construction activities such excavation, use of heavy machinery etc. may generate noise; »Use of unnecessary horns by drivers of construction/ fuel transporting vehicles; »Noise will also arise from generators operational during load-shedding hours.	»Drivers must be aware of their code of conduct and avoid use of unnecessary horns. »Implement mitigation measures suggested under sub-sections 6.9.6. & 6.10.6. »Minimum number of vehicle must be used for construction material to mitigate noise and exhaust emissions. »Daily monitoring by HSE manager of construction contractor to check compliance as per PEQS during construction phase. »Noise from generators must be curtailed within limiting values set by PEQS via engineering control.
6.4.	Emergency Response	»Design, & Construction Phase	»On site & On duty	»There are always chances of fire risks/ another hazard of worth considering (explosion, petrol spills, earthquakes etc.)	»Operating procedures must be in place to minimize the fire danger at the site. » It must be executed and monitored by project proponent in close liaison with design contractor of stated facility.
7. *Material Storage and others*					
7.1.	Construction Material Storage	»Construction phase	»On site	»Poor housekeeping leads to injuring of workers.	» Stockpiles shall not be situated such that they obstruct natural pathways » Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site » If stockpiles are exposed to windy conditions or heavy rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases

						» All substances required for vehicle/ machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site » Hazardous substances / materials are to be transported in sealed containers or bags » Spraying of herbicides / pesticides shall not take place under windy conditions
7.2.	Spills/ leakages		»Construction Phase	»Project area	»Spills/ leakage may result due to improper handling of paints, fuels, solvents, cements, chemicals etc.		»Ensure proper handling and storage of chemicals/ paints/ fuels etc. and should be marked to highlight their content. »Workers must be aware of their code of work. »Compliance to above stated as well as to use of PPEs by workers must be monitored by HSE manager of Construction Contractor during construction phase and project management during operational phase.
7.3.	Use of pesticides/ insecticides		»Construction Phase	»Project area	»Use of mosquito repellent sprays/ fumigation to disinfect and control pest/ disease vectors.		»Mosquito repellent sprays/ fumigation should be carried out as per project safety plan. All safety measures including use of PPE must be ensured. »HSE manager will monitor compliance to use of PPEs during pesticide spray.
7.4	Biological Hazards		»Construction phase	»Project site	»Excavation for the foundation of apartments		» Proposed project site does not involve cutting of any trees » Plantation of maximum number of trees. » Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. » Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna. » Contractor staff should be given clear instructions that they should not hunt any birds/ animal in the project area/ site » Barriers/ fencing/ or boundary wall should be installed

						at project site to protect movement of animals at the project site during constructions. » Proper disposal of organic waste (if any) generated during the construction stage to avoid rodents and other insects' generation.

** It contains when problem will occur and when, where & how it will be occur.*
*** It suggests whys of achieving mitigation measures [changing in planning and design/ improved monitoring and management practices/ compensation in money terms/ replacement, relocation & rehabilitation*

Moreover, assessed impacts and their mitigation measures are discussed in detail at each stage of proposed project activities as described below.

6.7 IMPACTS DUE TO PROJECT LOCATION

The project envisages Construction and development of huts under the name of Construction of huts & commercial building., located at khewat no 09, khatooni no 18, khasra no 593, Charhan, tehsil Murree, district Rawalpindi. The possible environmental impacts due to project location are described below.

6.7.1 Land Acquisition & Change in Land Use Pattern

As mentioned above the proposed project site is situated in area where no worth mentioning activity with special reference to environment is involved hence no significant adverse impact will happen. The adjacent land value will be increased by this project.

Mitigation

No.

6.7.2 Environmental Sensitive Areas

There is not any environmentally sensitive or critical zone in or around the project site.

Mitigation

Not required.

6.7.3 Historical, Archeological or Cultural Sites

There are no cultural resources, historical place or archeological sites such as ancient monuments, forts, sculpture, etc. to be destructed.

Mitigation

Not required.

6.7.4 Existing Infrastructure

Infrastructure like roads, electricity, telephone, natural gas and drainage system is already present in the area. As existing planning and design standards are suited to local conditions, hence, there will not be any unnecessarily wasteful of land.

Mitigation

Not required.

6.8 DESIGN RELATED IMPACTS

The construction plan of Apartments is taking all the consideration of all engineering details, their soundness and else as desired under the rules and regulations “Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007” for such

constructions. This will automatically take care of the soundness of the building and its design. The present EIA Report testifies that there will not be any environmental problems at all, due to project design.

In view of these considerations no environmental problems are foreseen in the context of design. However, the possible impacts of proposed project have been considered and their mitigation measures justified in Environmental Impact Assessment.

Mitigation

No.

6.8.1 Drainage Pattern

Drainage system is available around the project site for waste water disposal. The project site is located in near Murree-Islamabad Expressway and there is open drain present nearby project site. All the waste water (constituting sewage only) from the proposed facility will be disposed into this drain after due treatment in 3 stage septic tanks.

Mitigation

As there is no significant impact on drainage pattern, so, no mitigation is required.

6.8.2 Seismic Hazard

The proposed project is situated in Seismic Zone 3. In this zone intermittent earthquakes with fundamental periods greater than 1.0 second may cause damage to structures.

Mitigation

The structure of the proposed apartments has been designed in accordance with Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007, so that the building may withstand moderate to large earthquakes.

6.8.3 Water Resources

Ground water will be extracted via installation of electric pumps. Major use of this ground water is for allied activities such as washroom/ official activities by workers.

Mitigation

- Ensure that projected use of ground water is within the capacity of natural system to replenish itself.
- Use indigenous vegetation that requires less water, drip irrigation or shaded plantings.
- Workers should strictly be advised not to misuse or waste ground water in any way.

6.8.4 Traffic Patterns

The main entrance to the project site is from the Murree-Islamabad Expressway Road. This road passing by the project site has high carrying capacity and there will be no need to construct a separate road for this project. The existing road will be utilized for all the traffic movement involved in this project.

Mitigation

Not required.

6.8.5 Emergency response

There are always chances of earthquakes and other manmade disasters such as fires due to electrical short-circuiting, overheating, forest fire etc. Besides, proposed building layout has been designed with inception of such considerations.

Mitigation

The following mitigation measures will be adopted to minimize or eliminate the emergency situations:

- The design of proposed project will also include emergency exits and open space for gathering which can be used during emergency situation.
- Adequate water distribution system will be designed, which could also supply adequate quantity of water for fire-fighting during emergency.
- Fire hydrants and firefighting extinguishers will be provided at locations where necessary.

6.9 IMPACTS DURING CONSTRUCTION STAGE

The potential environmental impacts of the proposed project along with the mitigation measures during the construction stage have been described as following:

6.9.1 Impacts on Topography

Civil work will be done for the construction of proposed facility so there will not any major changes in the existing topography of the project site. The changes due to the civil work will be of localized nature. There will be no significant changes off-site the project area.

Mitigation

Not required.

6.9.2 Impacts on Soils

The overall geology and soil quality of the project site is not expected to be adversely impacted due to the execution of the proposed project during the construction period. Furthermore, the main finding of Soil Investigation Report of proposed project site

has been prepared by Royal Geotech Company Office no.09 First floor, Poonch House, Adamjee Road Saddar Rawalpindi, has been appended as **Annexure-XIII** of this EIA report. Complete Soil investigation report will be share on the demand of EPA.

Mitigation

Vigorous plantation needs to take place at the project site so that soil becomes stabilized.

6.9.3 Impacts on Groundwater

As mentioned above very small level civil work will be undertaken for establishment of the said apartments so the water quality will not be disturbed too much extent.

Mitigation

- The workers will be provided with washrooms and toilets at site.
- Proper sanitary system will be developed on temporary bases.

6.9.4 Impacts on Surface Water

Excessive runoff, especially in rainy days, due to different activities to be carried out during construction phase can result in the increase of Total Dissolved Solids **(TDS)** and Total Suspended Solids **(TSS)** in small water channels. Similarly, untreated sewage can result in high value of Chemical Oxygen Demand **(COD)** and Biochemical Oxygen Demand **(BOD)** of surface water.

Mitigation

- The workers will be provided with washrooms and toilets at site.
- Proper sanitary system will be developed on temporary bases.
- Wastewater effluent from construction equipment, washing-yards should be passed through the primary treatment process to remove macro contaminants before discharging it into natural streams.

6.9.5 Impacts on Air Quality

Due to the construction activities like excavation, clearing, leveling, compaction, material transportation, earthing/ grounding etc. dust will be generated which will ultimately increase the Particulate Matter (PM) value in the area. Gaseous emissions from the heavy machinery and vehicles will also come out and this will affect the quality of ambient air. This may also pose health risk to the construction workers and residents who suffer from respiratory ailments.

Mitigation

- Periodic environmental monitoring and testing of emissions from vehicles should be carried out in order to keep the concentration of various pollutants including CO,

Noise & Smoke within the PEQS limiting value.

» Ambient gaseous monitoring for various pollutants like CO, NO_2, SO_2, PM_{10} etc. should also be carried out periodically.

» Periodic maintenance of the machinery will be carried out to reduce the concentration of emissions.

» Haul-trucks carrying earth, sand, aggregate etc. will be kept covered with tarpaulin to help contain construction materials and being transported within the body of each carrier between the sites.

» Tyres of the vehicles and heavy machinery will be washed and the waste water produced as a result of this activity will be reused after due treatment. This will reduce concentration of PM in the ambient air.

6.9.6 Noise

Project activities like compaction, use of heavy machinery during the clearing of the site and trolleys and trucks used for the transportation of materials will create some noise and vibration. The noise may affect the workers and residents of the surrounding communities of the project site.

Mitigation

» Engines of vehicles visiting the project site should be properly tuned-up.

» Use of heavy machinery should be restricted to daylight hours in order to minimize noise pollution and vibration arising from the construction site.

» To bring down noise levels within the PEQS limiting values, noise control measures should be taken such as provision of silencers on the heavy construction vehicles and sound insulation materials should be used as barriers.

» Wide zone of green plants will also help decrease sound levels.

» As the proposed project is going to be constructed in the area far away from residential communities. This will further reduce the exposure of noise to the surrounding communities.

6.9.7 Water Consumption

During the construction of project approximate quantity of water will be used and it will not exert any significant effect on water table.

Mitigation

Not required.

6.9.8 Waste Generation

During the construction of project waste will be generated such as debris waste including clay, sand, crush, stones, paper, plastic, wood pieces, iron and steel as

scarp, wires, rags, ropes etc., sewage and solid wastes from construction camp.

Mitigation

- Most of construction waste will be utilized on site to fill excavated sites or recycled; remaining of it will be properly disposed-off/ landfilled.
- Septic tanks will be constructed for the treatment of sewage waste from construction camps and other construction activities. After due primary treatment of sewerage in septic tanks, it will be disposed-off in drain passing nearby the project site.

6.9.9 Construction Debris

Each phase of the development will produce solid waste, the disposal of which, if not managed properly could have negative impacts on the site and surrounding area.

Mitigation

» A site waste management plan should be made the responsibility of the project contractor to provide for the designation of appropriate waste storage area on the site and a schedule for the timely collection and removal of construction debris to an approved dump site.

» Only small quality of the waste will be produced as no major excavation is involved in the project.

6.9.10 Health and Safety of Workers

The construction activities will impose certain negative impacts on health and safety of the workers; however, mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Implementation of the following measures will ensure health and safety of the workers during the proposed construction stage:

» The Contractor will ensure that the workers / laborers are trained in safety procedures for all relevant aspects of construction.

» Proponent of the Project will make regular checks to ensure that the contractor is following safety working procedures/ safety measures.

» Formal emergency procedures will be developed for proposed project site in case of an accident. First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contacted in case of any accident.

6.9.11 Impacts on Flora & Fauna

There are 3-5 trees coming in the vicinity of proposed project site which will be

preserved. The establishment of the proposed project will not affect the fauna of the area.

Mitigation

Following mitigation measures will be adopted to restore the environment as much as possible.

» Impact mitigation calls for protecting and restoring as much of the original condition on the development site as possible.

» In an effort to preserve the existing biodiversity, naturally occurring plants such as those used primarily by the birds for food and shelter should be planted for their survival. This would ensure that primarily native plants are used in the landscape plan thus minimizing the use of imported species and eliminating the introduction of potentially invasive species.

» Using bird feeder may encourage the displaced avifauna to remain in or return to the general vicinity, thus maintaining the existing biodiversity.

» The project contractor should be subject to punitive penalties for removal or damage of ecologically valuable trees designated for protection or relocation (if any).

6.9.12 Transportation of Construction Materials

Transportation of heavy machinery implies heavy traffic on the roads leading to the site with possible impacts to the surrounding area (dust, spillage, emissions and noise). Use of uncovered vehicles for transportation of construction materials can lead to inadvertent dispersal of materials during heavy rains or high winds during dry periods. This could have a negative impact on the residents of the surrounding.

Mitigation

» The construction activity will go on for a short period of time and there will be no worth mentioned impacts from this activity on the project area.

» Arrangements should be made with contractors to ensure that the vehicles used for transporting materials and machinery to the site are appropriately sealed and covered to minimize dust.

» Dust producing materials such as sand or cement should be stockpiled in low enclosures and covered, away from drainage areas where they could easily be washed away during rainfall.

6.9.13 Traffic Congestion

During the construction of the project, movement of heavy trucks and machinery will have only a minor impact on the traffic of main Murree-Islamabad Expressway Road as it is a wide road specially designed for this kind of heavy traffic.

Mitigation

No mitigation measures are required as this activity will be for a short period of time and the carrying capacity of main Murree-Islamabad Expressway Road is fair enough to accommodate this traffic for that much time period.

6.9.14 Employment Generation

During construction stage of the proposed project, about 35-40 workers / laborers will be engaged. This will be positive change.

Mitigation

Not required.

6.10 IMPACTS DURING OPERATIONAL PHASE

The potential environmental impacts of the proposed project along with the mitigation measures during the operational phase have been described as following:

6.10.1 Impacts on Climate

The operation of proposed project will not affect the climate of the area on overall.

Mitigation

Not required.

6.10.2 Change in land use

As mentioned earlier, the proposed project is about construction of huts & commercial building, and no worth mentioning activity related to environment is involved at this phase of project, hence no significant adverse impact will happen.

Mitigation

Not required.

6.10.3 Impacts on Soils

The overall geology and soil quality is not expected to be adversely impacted due to the execution of the proposed project activities.

Mitigation

Vigorous plantation needs to take place at the open vacant spots by project proponent so that soil becomes stabilized.

6.10.4 Effluent Generation

From the proposed project no process wastewater will be produced. Approximately 10 - 15 gallons/ day of wastewater will be generated from toilets/ washrooms. This water needs to take treatment before discharging.

Mitigation

» As there is no source of chemical contamination in the process water so the waste water to be generated will have no water contamination and the waste water quality

will meet the prescribed limits of PEQS-Pakistan.

» The sewerage water will be treated in three stage septic tank.

» The treated effluents will be used for sprinkling on the unpaved area, landscaped area, plants and vegetation within/ or around project site.

» The remaining effluent of nominal quantity will be discharged into nearby drain through submerged sewerage pipes.

» While laying sewage pipes, measures will be adopted to ensure that other pipes, wires or systems already existing in the route of the sewage pipes from the building to the main sewer line are not damaged.

» Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.

6.10.5 Air Quality Deterioration

While operational stage of the proposed project there is no impact on air quality is anticipated as in its operational phase, this project is clearly of residential nature.

Mitigation

Not required.

6.10.6 Noise and Vibration

There is no such significant impact of noise and vibration associated with operational phase of this proposed project.

Mitigation

Not required.

6.10.7 Water Consumption

About 1500-2000 gallons of water will be used per day by the proposed project during the regular operation. This quantity of water will not exert any negative impact on water table.

Mitigation

Not Required.

6.10.8 Solid Waste Generation

During the regular operation of the proposed project 40-50kg solid waste will be produced, only kitchen waste/ Municipal Solid Waste will be produced.

Mitigation

The solid waste above is recyclable. This solid waste will be disposed off in an environment-friendly manner in line with the local municipality and through a licensed contractor who should dispose of the solid waste at the designated site by the

local municipality.

6.10.9 Health and Safety of Workers

The project activities will not impose certain negative impacts on health and safety of the residents. However, no mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Not required.

6.10.10 Employment Generation

During the regular operational stage of the proposed project approximately 15-20 workers will be engaged. This will be a major positive impact.

Mitigation

Not required

6.10.11 Fire Risk

There is always a chance of fire at any kind of premises/ buildings. If the fire-fighting arrangements may not arrange this will be a major negative impact.

Mitigation

The following mitigation measures will be adopted during the regular operational stage of the proposed project:

- Emergency Exits
- Smoke Detectors
- Fire Extinguishers (DCP 05 cylinders, AFFF 03 cylinders, CO2 02 cylinders, DCP 02 Trolleys)
- Emergency Signs
- Floor Marking
- First Aid Boxes (02)
- Fire-fighting Kit

6.11 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Besides the concrete measures to be adopted as described above, the quality of environment will further be enhanced through the running of project in complete accordance with the 5RS Principles- Reduce, Reuse, Recycle, Refurbish and Retrofit. Good house-keeping will be the order of the day. Proposed apartments will increase the land value, aesthetic value of area and will provide the tourists with proper facilitated residence to enjoy their visits. During construction and regular operation of the project activity, persons will be employed. Local people will be preferred for employment. People of all categories will get employment during construction as well as operational phase of the project.

CHAPTER-7

ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.1 ENVIRONMENTAL MANAGEMENT

To implement the recommendations and suggestions for environmental protection included in Chapter 6, a comprehensive management plan is needed.

The objective of the Environmental Management Plan (EMP) is to address all the major environmental issues and provide framework for the implementation of the proposed mitigation measures during the proposed project activities. The proper implementation of the EMP will ensure that all the adverse environmental impacts identified in the EIA are adequately mitigated, either totally prevented or minimized to an acceptable level. The required actions to achieve those objectives will be successfully adopted by the concerned institutions or regulatory agencies. The implementation of EMP will be carefully coordinated with design and management program of the project to ensure that relevant mitigation measures are implemented at the most appropriate stage and resources are properly allocated to achieve the desired results.

The purpose of the EMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of: (i) providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

7.2 INSTITUTIONAL CAPACITY

7.2.1 Environmental Committee and its Responsibilities

Project Proponent will constitute an Environmental Management Committee including at least one qualified and experienced environmental scientist / engineer who will be responsible for the environmental management and supervisory affairs during the different stages of the project. This person can be hired by the management or can be on contract basis. The responsibilities of the EMC are as follows:

- To ensure implementation of all the proposed mitigation measures during different stages of the proposed project;
- To organize routine monitoring of water, air quality, noise etc.
- To develop operational guidelines and implementation schedule.
- Receiving complaints from people in the vicinity of the project and concerned institutions and assisting the local environmental authority including establishing

liaison with EPA.

- To ensure that project is being implemented in an environmentally friendly manner, causing least harm to the existing environment including flora and fauna, geology and soil, surface and ground water, air quality, existing utilities etc. as already discussed in Section 6.
- To look after the efficiency of Horticulture Committee (HC).

A team will be formed named as "Horticulture Committee" (HC) to attend the issues relating to cleanliness, up keeping, aesthetic beauty of the project site, general environment enhancement, tree plantation, vegetation's promotion, planting of flowers and ornamental trees on site.

Project proponent will be responsible for the execution of the project with coordination of the client. The proponent will be bound to follow the provisions of the contract documents especially about the environmental protection measures and apply good management techniques and methodology without damaging the existing environment. Obligation(s) of the proponent, to safeguard and mitigate adverse impacts and rehabilitate the environment will be addressed through environmental provisions in the contract document(s) as already highlighted in Chapter 6 and through adequate implementation at site.

7.3 TRAINING SCHEDULES

The management staff and labor of proposed project will be trained about the requirements of Environmental Management System, including but not limited to the environmental health and safety, efficient use of resources, emergency response, fire protection and safety / security issues etc.

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The project management will play a key role in this context.

Environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult to implement effective environmental protection measures. Domestic training program is proposed to train the staff. Training Plan has been formulated as part of EMP which is presented as Table 7.1 below:

Table 7.1: Staff Training Plan

Objective	Regular training & learning opportunities are an investment that helps employees to prosper their skills for their own and the organization's benefit.
Responsible	Proponent
In-Charge	Project Management
Trainer/ Facilitator	Internal and External Trainers
	[Sign here]

Training Schedule*:

Following training schedule will be adhered to train the workforce of construction of huts & commercial building, internally and by external trainers. Tool box talk will be the regular feature of this training plan on weekly basis.

Training Topics	**Month 1-4**	**Month 4-8**	**Month 9-12**
Environmental Compliance of applicable laws			
Safe Use of Machinery			
Code of Conduct			
Health & Safety			
Emergency Drill			
First Aid			
Handling of hazardous material and use of PPE			
Environmental Safeguards			

*Please note – orientation/trainings will continue to be conducted twice a year, per the mentioned schedule.

Training will continue to be provided at 8:00 a.m. The entire training sessions will last approximately 3.5 hours, but may take as long as 4 hours, depending on the number of people in attendance.

New staff should be made aware of this training/orientation session, at the time of hire.

7.4 IMPACTS & MITIGATION MEASURES

The EMP provides comprehensive mitigation and management measures for the following phases of the project:

7.4.1 Summary of Impact & Mitigation Measures

This section of EMP provides summary of management principles for the construction & operational phase of the project. The impacts on environment which are likely to be generated during execution of these phases are described in table 7.2.

7.4.2 Mitigation Plan for Construction & Operational Phase

This section of EMP provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and therefore, the contractor will be required to comply with the specifications to the satisfaction of the project Manager and Environmental Control Officer, in terms of the construction contract.

This section of EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedure and responsibilities are required from proponent within the operation and maintenance phase are satisfied.

7.5 Environmental Monitoring Program

It will be in the fitness of the things to operate this project under the Environmental Management Plan. Regular monitoring of all the significant environmental issues is essential to check the compliance status of EMP. The main objective of the monitoring will be;

- To verify the results of the environmental study with respects to the proposed project.
- To estimate the trends of concentrated values of the issues, which have been identified as critical and then planning the mitigating measures.
- To assess the efficiency of pollution control mechanism.
- To ensure that any additional parameters, other than those identified in the IEE report, do not turn critical after the commissioning of proposed project.

Environmental monitoring program for proposed project is described in table 7.3.

7.6 ENVIRONMENTAL BUDGET

The cost for environmental management and monitoring will be the part of contract of Contractor and Consultants respectively. However, a lump sum amount of PKR 0.5

million will be allocated by the project proponent as cost for environmental training, monitoring and tree plantation for a period of one year during construction and operation of the project. After that, monitoring program will be revised in consultation with EPA and cost will be revised accordingly.

Table 7.2: Summary of Mitigation & Impact Assessment

Activity	Environmental Impacts	Mitigation	Manifestation	Methods of Implementation
Construction Phase				
1. Air Quality	– Dust resulting from construction work – Use of heavy machinery can generate exhaust and dust emissions – Dispersion of particles from stockpiles during high velocity wind – Smoke from burning of waste materials or burning of firewood in the labor camp	- Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. - Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion - Periodic maintenance and management of all the construction machinery and vehicles - Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	During Construction Phase by Contractor with coordination of Proponent.	– Hiring of reputable contractor with sound knowledge of environment and HSE; – Regular inspection of storage material by competent person – Substantial training of Workers before commencement of work; – Monitor the performance of contractor/ workers.
2. Water Quality	Run-off water from construction area – Inappropriate disposal of waste. – Open sewerage water disposal on land can	– Use of spill prevention trays and impermeable sheets to avoid. – contamination of the water – Furthermore, septic tanks will be constructed which will be cemented to prevent the domestic water contamination	Construction Phase by Contractor with coordination of Proponent.	– Hiring of reputable contractor with sound knowledge of environment and HSE; – Regular inspection of site by competent person – Substantial training of Workers before commencement of work; – Monitor the performance of

	contaminate water quality and cause generation of mosquitoes and various other insects in the area. Leakage of oil and chemical materials from construction activity	– Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust) – Proper disposal of waste material on dumping sites to avoid leachate generation – Prohibit illegal dumping of waste – The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water source/s.		contractor/ workers.
3. Solid Waste	– Construction waste from construction activities – Domestic waste from workers – Hazardous waste such as dry batteries and chemicals etc.	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rule. – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No	During construction and operational phase	- Project proponent and Contractor

		waste or debris will be thrown in the river or other water bodies □ Contractor will prepare waste management plan related to construction activities; get its approval from RE and ensure its full implementation		
4. Noise	- Noise caused by construction machinery and vehicles used for mobilization of construction equipment and workers	– The contractor will strictly follow the NEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Proper maintenance of vehicles and construction equipment. – Minimize/avoid unnecessary use of pneumatic drills and other noisy machinery The personal protective equipment (PPE) will be provided to the construction workers and its usage will be made mandatory	□ In Construction Phase by Contractor with coordination of Proponent	- Regular inspection of machinery by contractor. - Proponent ensure contractor working without harming environment.
5. Material Management	- Improper store leads to environmental pollution. - Harm to soil in case of chemical/oil leakage - Worker health injury	– Stockpiles shall not be situated such that they obstruct natural pathways – Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site	□ In Construction Phase by Contractor	- Regular inspection of machinery by contractor. - Proponent ensure contractor working without harming environment.

		– If stockpiles are exposed to windy conditions or heavy rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases – All substances required for vehicle/ machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site – Hazardous substances / materials are to be transported in sealed containers or bags – Spraying of herbicides / pesticides shall not take place under windy conditions		
6. Biological Resources	– Removal of vegetation covers by cutting of trees, crops, herbs and shrubs – Fauna including birds and animals will be affected during excavation,	– Proposed project site does not involve cutting of any trees – Plantation of maximum number of trees. – Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. – Open fires should be prohibited in	□ Contractor and proponent responsibility to ensure safe environment.	- Regular inspection of machinery by contractor. - Proponent ensure contractor working without harming environment.

	movement of labor and carriage of goods and machinery	the area to avoid the hazard of fire and impact on nearby flora and fauna. – Contractor staff should be given clear instructions that they should not hunt any birds/ animal in the project area/ site – Barriers/ fencing/ or boundary wall should be installed at project site to protect movement of animals at the project site during constructions. – Proper disposal of organic waste (if any) generated during the construction stage to avoid rodents and other insects' generation.		

7. Seismicity		□ The design specification will be followed to withstand seismic loads in accordance with the Uniform Building Code (UBC) - 1997 and Building Code of Pakistan (BCP), Seismic Provisions - 2007, as required by local codes and standards[6] for high degree of structural competence, reliability and ease of construction.(See section 6.6.2)	□ Contractor with coordination of proponent and Engineer	- Building design should be according to Building code of Pakistan 2007.
8. Workers Health & Safety	- Poor housekeeping - Improper use of equipment - Unskilled staff - Lack of supervision	– Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation – Safety training to the workers – Safe driving training to the drivers – Adequate safety signs on site – Provide training regarding proper handling and use of chemicals/ paints – Install fire extinguishers at fire handling places	- Certified contractor and Proponent	- Proper training of workers. - Ensure worker have specific PPEs.

[6] *Structural design at present in Pakistan is designed as per UBC-97 and ACI 318-02M because of the local techniques, procedures, technologies and material available for concrete and other construction material. The building Codes BCP, SP-2007, Design of Concrete Structures by Arthur H. Nilson, Design of Reinforced Concrete by M. C. Cormac, Foundation Analysis and Design by J.E. Bowles will also be followed in due course of time upon availability of advanced materials and techniques in Pakistan.*

		– Any loss of public/ private property will be compensated by the contractor – Regular checks should be carried out to ensure a contractor's is following safe working procedures and practices.		
9. Socio-economic Impacts	- Disturbance to local community by construction work	– Contractor's activities and movement of staff to be restricted to designated construction areas – The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time – Disruption of access for local residents, commercial establishments, institutions, etc. must be minimized – Provide walkways and metal sheets where required to maintain access for public or vehicle – The site must be kept clean to minimize the visual impact of site – Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors	- Contractor with coordination of proponent and Engineer	- Hiring of reputable contractor with sound knowledge of environment and HSE; - Regular inspection of storage material by competent person - Substantial training of Workers before commencement of work; - Monitor the performance of contractor/ workers.

		□ Noisy activities must be restricted to the times given in the Project.		
10. Clearance of site from extra / surplus material and construction equipment	- Tree cutting, - damage to land - soil removal	– Timely removal of waste from the site to avoid congestion at work place. – Construction waste should be collected and disposed separately from other waste. – Contaminated soil (if generated) due to accidental spills will be removed and transported to suitable site for disposal. – Safe transportation of construction equipment from the site. – The contractor must ensures that all structure, equipment, materials and facilities used or created on site for/ or during construction activities are removed. – Empty/available space will be covered with grassy lawns in addition of parks establishment as component of this project. – Use of native vegetation as a part of landscape. Ornamental plant species like roses, jasmine, and seasonal flowers can be used in proposed landscaping, which is a	- Contractor with coordination of proponent and Engineer	- Hiring of reputable contractor with sound knowledge of environment and HSE; - Regular inspection of storage material by competent person - Substantial training of Workers before commencement of work; - Monitor the performance of contractor/ workers.

		common practice in this part.		
Operational Phase				
1. Air Quality	- No	□ During regular occupancy of the buildings, no activity is envisaged to take place which may generate dust of any significance. Under the policy of the management all care will be taken to keep the in residential activities environmentally sound and sustainable.	□	□ Ensure by proponent and EPA
2. Water Quality – Wastewater/ Sewerage	- No	– Sewerage after due treatment will be discharged to drain passing nearby site. – Adequate disposal system shall be made available and maintain the sewer lines both on site and off site. – Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer	□	□ Ensure by proponent and EPA
3. Waste □ Solid Waste/ Garbage	□ Open dumping leads to epidemic diseases	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – All wastes to be generated during	□	□ Ensure by proponent and EPA

		regular operations (occupancy) of the apartments shall be collected daily through locally placed wastes collecting bins. – Of these, wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles and like shall be sold in the market for reuse. Kitchen wastes including vegetables and fruits peels shall be disposed off into the wastes collection bins. Redundant electric gadgets, air coolers, electric fans, redundant furniture, house hold articles, office use equipment etc shall be sold in the markets (KABARIS). – The waste which is useless will be disposed of at appropriate and designated site – Prohibition of dumping of any contaminating material		

4. Noise & Vibration – Noise and vibration from water pumps etc. – Noise from vehicles used for mobilization of equipment/ raw material/ waste	□ No	– In order to avoid noise in the project area, vehicles shall be operated as avoid use of horns – No activity producing extra ordinary levels of noise will be allowed in the society as a policy matter. – Adequate basis of equipment to reduce the vibration – Adequate enclosure of equipment to reduce noise.	□	□ Ensure by proponent and EPA
5. Emergency Response	– In case of fire pollute environment. – Property loss.	□ The design of building/ apartments should include emergency exits and open space for gathering which can be used during emergency situation.	□	□ Ensure by proponent and EPA

Table 7.3: Environmental Management Plan.

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
Construction Phase					
1.	**Air Quality** – Dust resulting from construction – Use of heavy machinery can generate exhaust and dust emissions – Dispersion of particles from stockpiles during high velocity wind – Smoke from burning of waste materials or burning of firewood in the labor camp	Compliance with prescribed PEQS to control air pollution	– Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion – Periodic maintenance and management of all the machinery and vehicles – Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	Construction Contractor with coordination of Proponent	Proponent/ EPA
2.	**Water Quality** Run-off water from construction area – Drainage of wastewater on ground can contaminate the soil and groundwater. – Inappropriate disposal of waste. – Open sewerage water disposal on land can contaminate ground water and cause generation of mosquitoes and various other insects in the area. – Leakage of oil and chemical materials from construction	Control of groundwater or surface water pollution from construction activities	– Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater – Maximize the use of treated waste water on site (e.g. sprinkling purpose to control dust) – Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater – Prohibit illegal dumping of waste – The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water source/s. – Regular water quality monitoring according to determined sampling schedule; – The contractor shall ensure that construction debris do not find their way into the drainage system which can block	Construction Contractor with coordination of Proponent	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
	activity		them; Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/ retention pond.		
3.	**Waste** – Waste from construction activities – Domestic waste from workers	– Proper & safe handling and disposal of construction related waste – Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal – Implementation of waste management plan	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rules – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No waste or debris will be thrown in the river or other water bodies – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation	Construction Contractor with coordination of Proponent	Proponent/ EPA
4.	**Noise** Noise caused by construction machinery and vehicles used for mobilization of equipment and workers	Compliance with prescribed PEQS to control Noise pollution	– The contractor will strictly follow the PEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Provision of acoustic enclosures (hoods and shrouds) on generator – Proper maintenance of vehicles and construction equipment. – Minimize unnecessary use of pneumatic drills and other	Construction Contractor with coordination of Proponent	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
			noisy machinery - The personal protective equipment (PPE) will be provided to the workers and its usage will be made mandatory		
5.	**Biological Resources** – Removal of vegetation covers by cutting of trees, crops, herbs and shrubs – Fauna including birds and animals will be affected during excavation, movement of labor and carriage of goods and machinery	– Obligation to respect wildlife, Forest and Fisheries Laws. – Conserve biodiversity and its terrestrial as well as aquatic habitat	– Proposed project site does not involve cutting of any trees – Plantation of maximum number of trees. – Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. – Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna. – Proper disposal of organic waste (if any) generated to avoid rodents and other insects' generation.	Construction Contractor with coordination of proponent	Proponent/ EPA
7.	Staff Conduct	- Timely completion of project activities	- The Contractor must monitor the performance of workers to ensure that point relayed during their induction have been properly understood and being followed	Construction Contractor	Proponent/ EPA
8.	Leakages/ spills/ Paints/ Used oil	- Compliance with standards set forth by "Guidelines for Oil Spill Waste Minimization and Management" issued by International Petroleum Industry Environmental Conservation	– Contractor will apply strict rules on his workers and labor to ensure that no spill or leakages are caused – Chemical waste will be disposed of in approved disposal site. – PPE will be enforced to use during the handling and application of chemicals – The contractor will employ the general criteria for oil and leakage at construction sites, as per standards	Construction Contractor	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		Associate			
9.	Workers Health & Safety	Prevention of any possibility of work site accident /impact on worker's health	– Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation – Safety training to the workers – Safe driving training to the drivers – Adequate safety signs on site – Install fire extinguishers at fire handling places – Any loss of public/ private property will be compensated by the contractor – Regular checks should be carried out to ensure a contractor is following safe working procedures and practices.	Construction Contractor	Proponent/ EPA
10.	Socio-economic Impacts	– Prevention of conflicts among locals and make the project socially acceptable – Empowerment of locals to possible extent – Increase in employment and business opportunities for locals	– Contractor's activities and movement of staff to be restricted to designated and within industry – The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time – The site must be kept clean to minimize the visual impact of site – Noisy activities must be restricted to the times given in the Project Specification or General Conditions of contract – The Contractor are responsible for ongoing communication with those people that are interested in / affected by the projects – Employ local residents as much as possible	Construction Contractor with coordination of proponent	Proponent/ EPA
11.	Clearance of site from extra / surplus material	Restoration of site to a similar	Timely removal of waste from the site to avoid congestion at work place.	Construction Contractor	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	– Care will be taken during handling and disposal of waste. . – Avoid mixing of hazardous waste with non-hazardous waste. – Safe transportation of construction equipment from the site. – Empty/available space will be covered with grassy lawns & ornamental plant species like roses, jasmine, and seasonal flowers		
Operational Phase					
1.	**Air Quality Deterioration**	Compliance with Ambient air quality (PEQS) standards for control of ambient air pollution	During regular occupancy of the buildings, no activity is envisaged to take place which may generate dust of any significance. Under the policy of the management all care will be taken to keep the in residential activities environmentally sound and sustainable.	Project Manager	Project Proponent/ EPA
2.	**Water Quality** Wastewater/ Sewerage	Compliance with Wastewater standards	– Sewerage after due treatment will be discharged to drain passing nearby site. – Adequate disposal system shall be made available and maintain the sewer lines both on site and off site. – Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.	Project Manager	Project Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
3.	**Waste** Municipal Solid Waste	– Compliance with waste management rules – Prevention of inappropriate waste disposal	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – Wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles shall be sold in the market for reuse. – Prohibition of dumping of any contaminating material	Project Manager	Project Proponent/ EPA Punjab
4.	**Noise & Vibration** Noise and vibration from generators & water pump	Compliance with prescribed PEQS to control Noise pollution	– No activity producing extra ordinary levels of noise will be allowed – Adequate basis & enclosure of generator & water pumps to reduce the vibration & noise – Standby generator shall be curtailed within the limiting values of the Punjab Environmental Quality Standards.	Project Manager	Project Proponent/ EPA Punjab
5.	**Environment quality enhancement measures:** – Flowers and plants and trees – Aesthetic beauty of the buildings and the area	Enhanced land value and scenic beauty of the area	– Plantations in and around the proposed facility must be carried out. – Fountains or other such aesthetic measures must also be taken into consideration in order to increase the beauty of area. – All other necessary measures shall also be taken to maintain standards of cleanliness so that the buildings may add to the scenic/aesthetic beauty of the area around.	Project Manager in close liaison with project proponent	Project Proponent/ EPA Punjab

Table 7.5: Environmental Monitoring Plan.

Parameter/Receptor	Location	Monitoring Parameter	Monitoring and Reporting Frequency
Physical Environment			
Water Quality	▪ Ground Water ▪ Surface Water	Discrete grab sampling and laboratory testing of water samples.	▪ Sampling and laboratory testing should be done quarterly during construction stage and on annual basis during the operational stage. ▪ Discharges from the facility should be tested for temperature, pH and turbidity.
Air Quality (Dust emissions, vent emissions)	▪ Tracks along road ▪ Indoor air quality ▪ Inside workplace/ Fuel Storage Area	Ambient Particulate Matter, flue gas emissions, fumes Monitoring. Physical Inspection for petrol leakages or drippings.	▪ Ambient Air Monitoring should be conducted quarterly during construction stage and on annual basis during the operational stage.
Noise Levels	▪ Selected locations along the access	Noise in dB(A)	▪ Quarterly during the construction & annually during operational phase.
Pest Control	▪ Petrol Filling facility	Spray of pesticides and fumigation to avoid spread of vectors.	▪ Once in a year when needed during constructional phase of the project.
Ecological Environment			
Cutting of trees Tree plantation	In all Project Area during the execution of proposed project.	Landscaping.	▪ Monthly during construction phase monitoring and annually during the operational phase.
Socio-cultural Environment			
Inconvenience to community/ Public Health	All around the Project Area	Consultations with community to get feedback about inconvenience due to the constructional activities to perform their daily routine chores.	▪ Quarterly monitoring and reporting during the constructional period.

CHAPTER-8

RECOMMENDATIONS & CONCLUSIONS

8.1 RECOMMENDATIONS

The Environmental Impact Assessment (EIA) Report and survey results are finally evaluated to recommend the following:

- The present Environmental Impact Assessment (EIA) Report of Construction of Huts & Commercial Building on khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi.' meets the administrative and legal framework of the EPA Punjab.
- Care shall be given on the health and safety of workers during construction & operational phases of the project.
- The Proponent should assign trained staff for execution of proposed project activities.
- The Proponent should plant vigorously indigenous plants and trees in and around the project site.
- Consider Fire safety precautions to prevent or reduce the likelihood of a fire to break out.
- There should be adherence to safe working procedures to ensure health safety of workers.
- Mosquito repellent sprays/ fumigation should be carried out to keep facility disinfected and pest free and spread of disease vectors in control.

8.2 CONCLUSION

The EIA Report of Construction of Huts & Commercial Building, located at khewat No. 09, Khatooni No. 18, Khasra No. 593, Charhan, Tehsil Murree, District Rawalpindi – Pakistan is made to fulfill the legal requirement of Punjab Environmental Protection Act, 1997 [Amendment, 2012]. In order to address the potentially adverse impacts of the project, an EMP has been developed, which will further improve the environmental performance of the project. The EMP assigns roles and responsibilities, provide environmental guidelines and discuss the scope of Environmental Management Plan.

The EIA Report has thoroughly assessed all the potential environmental impacts associated with the project. The environmental impacts identified by the study are manageable. Project specific and practically suitable mitigation measures are recommended to mitigate the impacts. This EIA concludes that proposed project will not pose any major adverse environmental impacts on environment if the anticipated impacts are properly mitigated and the Environmental management Plan is properly implemented. It is environment friendly project as it fosters the economic, social and aesthetic values of country without any environment degradation. The project solves various environmental and social problems already raised by the poor health care system in the Pakistan. Therefore, the project under

consideration does not require any further environmental study; hence the EIA Report has been completed for the said project so the said project is recommended for the Environmental Approval and issuance of NOC from the EPA, Punjab.

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The following documents, reports were consulted during the preparation of this report.

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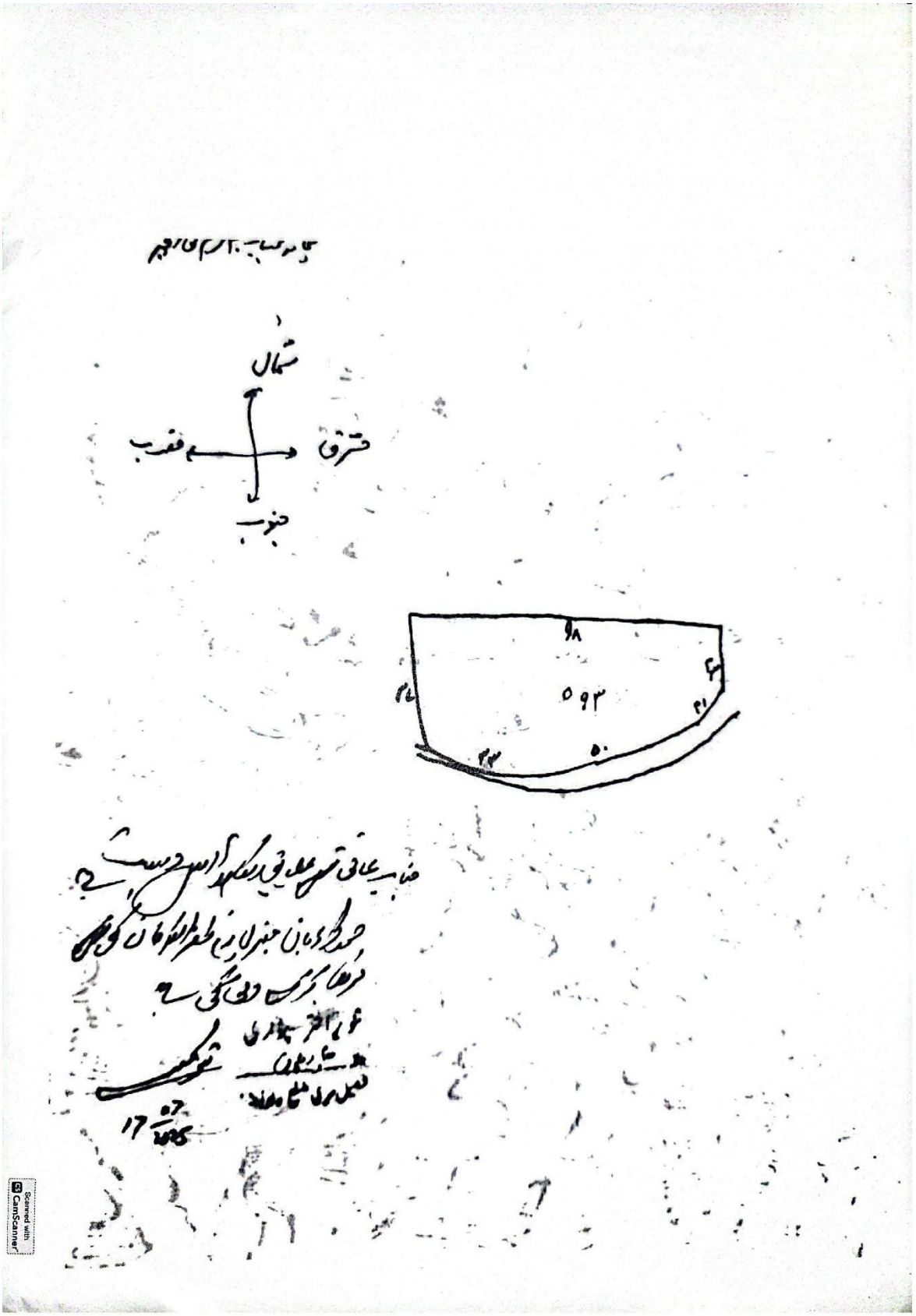
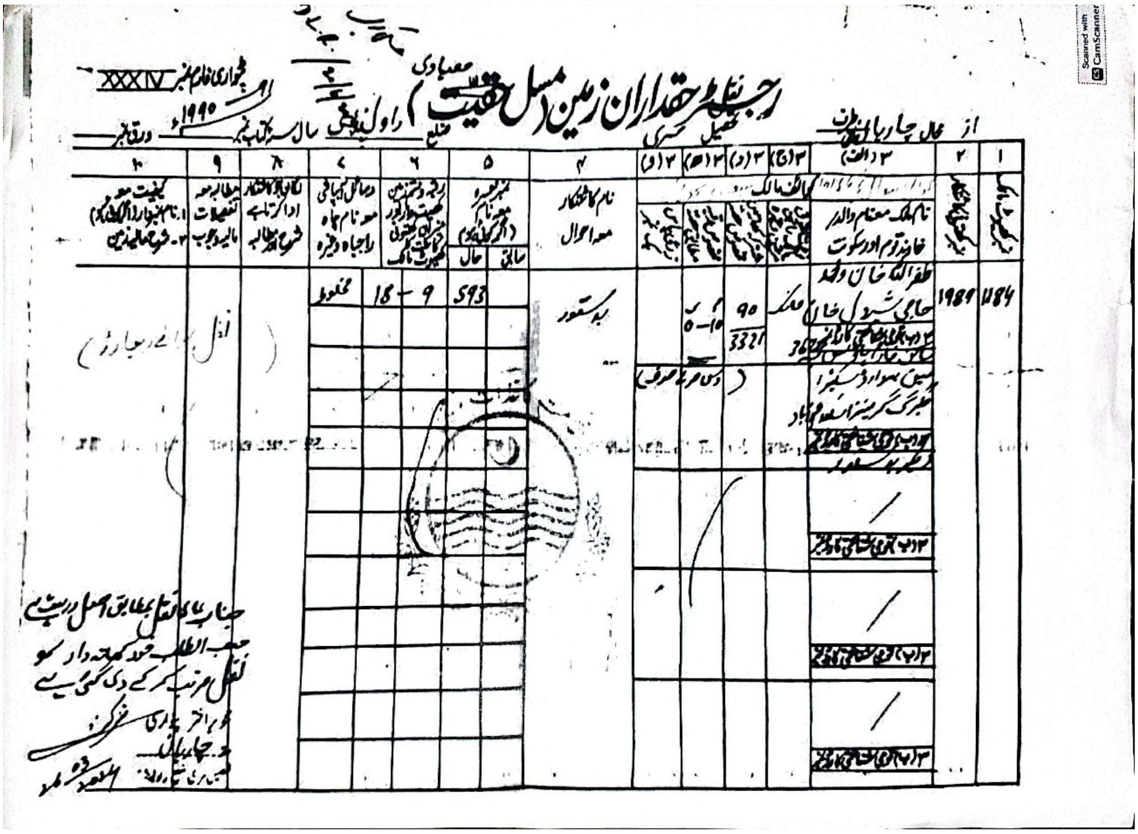
ANNEXURE-I

Land Ownership Documents (Aks-e-Shajra & Faed-e-Malkiyat)





رجسٹر حقداران زمین (مسل حقیت)

پٹواری فارم نمبر XXXIV

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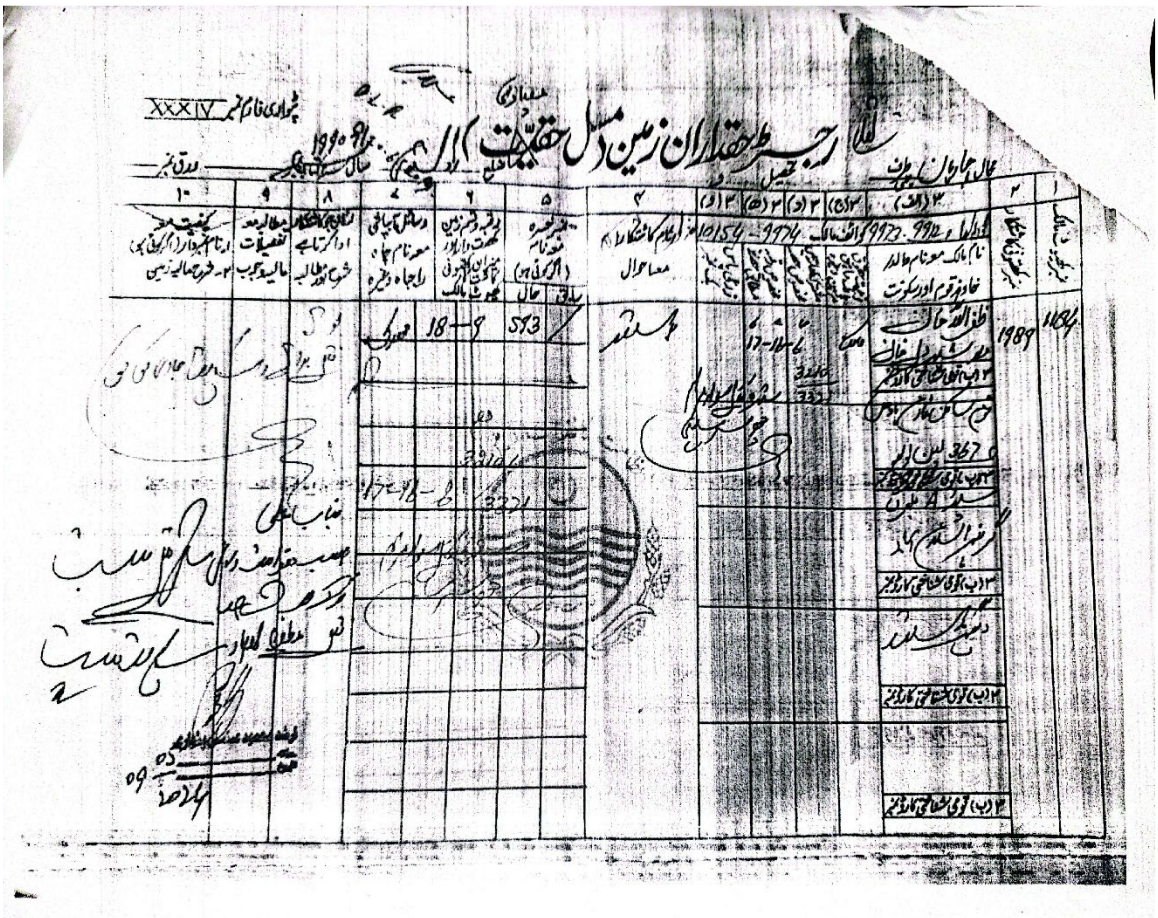

رجسٹر حقداران زمین (مسل حقیت)

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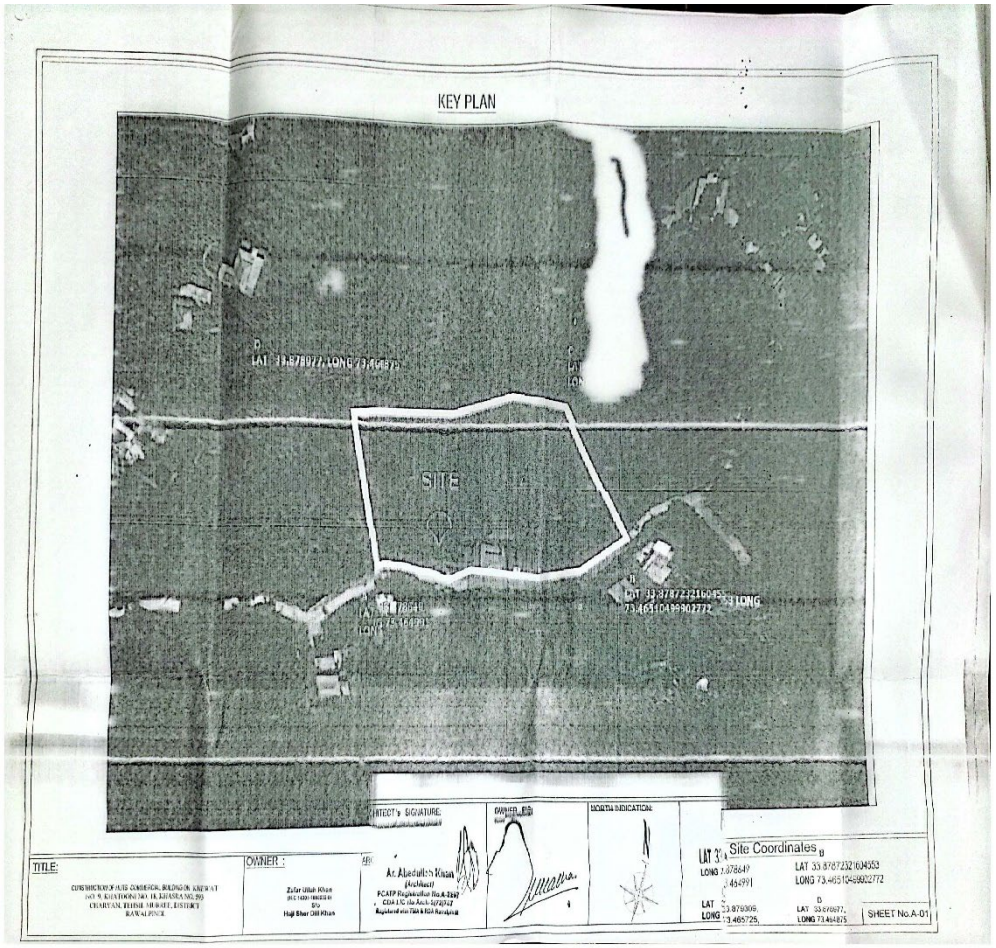
ANNEXURE-II

Layout Plan

ANNEXURE-III

Site Location Map



ANNEXURE-IV

List of Team Members Performing EIA Study

SR. NO.	PERSON NAME	DESIGNATION
1.	Mr. M Sami Ullah	Director
2.	Dr. Sidra	Environment Specialist
3.	Mr. Basharat	Environmentalist
4.	Malik Hannan Yousaf	Biodiversity Experts
5.	Mr. Awais	Environmental Engineer
6.	Mr. Abdul Haseeb	Field Officer

ANNEXURE-V

NOCs from other Govt. Departments

ANNEXURE-VI

Air Quality Monitoring

ANNEXURE-VII

Background Noise Monitoring

ANNEXURE-VIII

Water Quality Monitoring