

FAISAL RESIDENCIA

SECTOR E-17, ISLAMABAD



ENVIRONMENT IMPACT ASSESSMET (EIA)



PREPARED BY
ADVANCED ENVIRONMENTAL SOLUTIONS

OFF- 20, 2ND FLOOR, FAISAL PLAZA, KASHMIR ROAD, SADAR, RAWALPINDI CANTT
CELL # 0322-5575524, 0333-5575524

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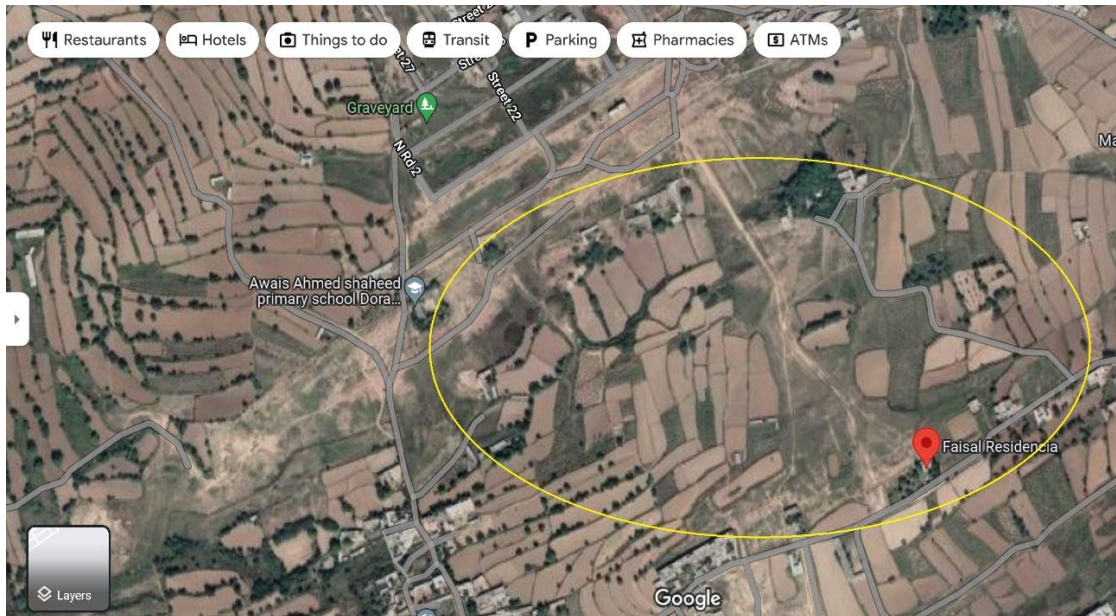
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SECTION 1 INTRODUCTION

1.0 Introduction of the Project

Mr. Khan Ahmed Saleem Director of M/s ZEDEM International (Pvt) Ltd. has planned to launch a housing scheme named as "Faisal Residencia" in Sector E-17, Islamabad. This project is located at Sector E-17, Islamabad. Currently the proposed project is under planning.

The Faisal Residencia will be built in accordance with the modalities and procedures being followed by private housing schemes in Islamabad.



LOCATION MAP

Figure 1.1: Location of the Project Area

1.1 Project Background

ZEDEM International (Pvt) Ltd. is one of the largest real estate developers. ZEDEM International has a valuable contribution in building a new face in real estate sector and recently planned to launch housing society namely "Faisal Residencia" at Sector E-17, Islamabad. The town planning is done by firm namely "Town Planning Centre (TPC)", Mr. Sajjad Ahmed the Town Planner.

ZEDEM International (Pvt) Ltd. has past experience of developing projects like “Faisal Town” at District Rawalpindi, providing world class living standards to its members.

1.2 Objectives of the Project

Islamabad is an expanding city with the growing need of world class facilities and services. It is the main axis of Pakistan for almost all the national and international activities. The main objective of the proposed project is to provide world class facilities to the residents and also to the community of Rawalpindi, Islamabad and the surrounding areas which will add to upgrade the existing state of affairs of Islamabad, the Capital of Pakistan. To cope with the challenges of ever changing world criteria, it is necessary to keep our standards in line with international prerequisites. The proposed project will add a valuable contribution and present a new face to Islamabad and in turn to Pakistan.

1.3 Screening of the Project

EIA is mandatory according to the Section 12 clause (1) of the Pakistan Environmental Protection Act (PEPA, 1997) for all the developmental interventions. According to Pak-EPA (Review of IEE/EIA Regulations, 2000), the proposed project (Faisal Residencia) falls under Category H (Urban Development and tourism) of schedule II, which states that “Any urban development or tourism development projects with total cost more than Rs. 50 million” require the EIA study.

1.4 Objectives of the EIA Study

The overall objectives of this Environmental Studies are to promote such development activities, which are environmentally friendly and sustainable. The specific objectives of this EIA study include:

- Review of legislative and policy framework related to environmental and social aspects of EIA such as environmental legislations, policies, and environmental approvals for the developing projects and national environmental quality standards (NEQS) etc. ;
- Review of baseline environmental conditions using both primary and secondary sources of information;
- Review of biophysical and socio-economic conditions in the project area.
- Identifying environmental impacts both during construction and operation phases of the project and suggest suitable mitigation measures; and
- Developing environmental management plan (EMP) identifying roles and responsibilities of the institutions involved in the implementation of the project

1.5 Scope of the Study

The scope of this study includes the “preparation of the Environmental Impact Assessment (EIA) Report for the Faisal Residencia, Islamabad”. For the preparation of this Report, both primary and secondary data have been utilized.

1.6 Project Area

The Project area of the Faisal Residencia is located at Sector E-17 Islamabad.

1.7 Standards and Guidelines

Environmental Issues and control in Pakistan are governed by the Pakistan Environmental Protection Act, 1997, provide a brief of policy and legal framework relevant to this EIA study. Pakistan Environmental Assessment Procedures and Review of IEE and EIA Regulations, 2000 also have been taken into account, while preparing the EIA Report.

1.8 Time Period for the Project

The EIA study awarded to Advanced Environmental Solutions on December 1st, 2022 and total time period for the study is 1.5 months, to be completed up to January 15th, 2023. Table below shows Time Schedule of the Project.

S. No.	Description	Year
1	Project Planning	2022
2	Construction Scheduled	2023
3	Construction completed	2030

1.9 Approach and Methodology

The methodology adopted for carrying out this Environmental Impact Assessment is based on the guidelines of the Pak-EPA. The salient features of each activity are provided in the following paragraphs:

Task 1: Desk Review of the Project Documents, Relevant Policies and Guidelines etc. and Interaction with the Client and other Line Agencies

The Consultant mobilized its Project Team for collection and review of all relevant policies of the Government of Pakistan (GoP) on environmental issues. All available national publications and data on environment such as GoP's National Environment Policy (2005), National Conservation Strategy (1992), Pakistan Environmental Assessment Procedures (1997) etc. were consulted.

The Consultant simultaneously started interaction with the client and also remained in contact as and when required. At the same time, all other line agencies including government and non-government organizations were also consulted.

Task 2: Survey of Biophysical and Socio-economic Parameters

The survey of biophysical and socio-economic parameters includes collection of baseline data in the Project Area mainly consisting of the following parameters:

Physical Environment

- Climate
- Geology, Topography and Soil
- Hydrology
- Seismology
- Ground Water Quality
- Surface Water Quality
- Air Quality
- Noise and Vibration
- Solid Waste
- Terrestrial Flora and Fauna
- Protected Areas / Reserved Forests
- Rare / Endangered Species

Social Environment

- Demographic profile
- Settlement Pattern
- Housing patterns
- Economic Features
- Public facilities
- Physical and cultural heritage
- Recreational sites

The following tools / data are used for establishing the environmental and social profile of the Project Area:

Site Reconnaissance: The survey was conducted with the purpose to have a familiarity with the Project Area and to develop the study tools related to the features of the Area.

Collection of Data from Primary Source: The primary data was collected by developing various study parameters keeping in view the nature of the EIA study. The data was collected by applying the various study tools / techniques.

Collection of Data from Secondary Sources: The available published information related to the Project Area, relevant policies and guidelines prepared by various government organizations were obtained and reviewed. This review provided a base to go head.

Impact Assessment: The information related to bio-physical and socio-economic components was collected to assess the possible changes due to the proposed construction of the project. The impacts were assessed both in qualitative and quantitative forms like changes in various environmental parameters, variations in those parameters and consequences of those variations. All the possible efforts are made to control changes in those variations and defining the possible mitigation measures.

Public Consultation: Public Consultation was also held to effectively involve the potential stakeholders in the preparation of this EIA Report.

Documentation: Based on all the above activities related to EIA process of Pak-EPA, this EIA Report is prepared.

1.9 Components of the Report

This EIA Report consists of the following eight Sections:

- | | |
|-----------|---|
| Section 1 | gives the introduction to the EIA Report; |
| Section 2 | discusses the salient features of the relevant Environmental Policies and Legislations; |
| Section 3 | provides the outlook of the project description; |
| Section 4 | discusses the biophysical environmental conditions of the project area; |

- Section 5 discusses the baseline social conditions of the project area;
- Section 6 is about findings of public consultation;
- Section 7 gives the detailed description of environmental impacts and their mitigation; and
- Section 8 provides outlook towards environmental management plan prepared for the project.

SECTION 2

INSTITUTIONAL, LEGISLATIVE AND POLICY FRAMEWORK RELATED TO IEE / EIA REQUIREMENTS

2.0 Organizations for Environmental Management

2.0.1 Federal Government Institutions

Headed by a federal minister, the Ministry of Environment, Local Government and Rural Development is the main government organization responsible for protection of environment and resource conservation. The Ministry works in collaboration with the Pakistan Environmental Protection Council (PEPC) and the Federal and Provincial Environmental Protection Agencies formed under PEPA 1997 (In Punjab, formerly it was Environmental Agency but now it is Environmental Protection Department i.e. EPD-Punjab). The PEPC and Pak-EPA (Federal Environmental Protection Agency) are primarily responsible for administering the provisions of the PEPA, 1997. The PEPC oversees the functioning of the Pak-EPA (Federal Environmental Protection Agency).

The Federal Government has formed the PEPC. Its members include the President of Pakistan, or a person appointed by the President, as the Chairperson; the Minister of the Ministry of Environment as the Vice-Chairperson; Governors of the Provinces; Ministers In-charge of the Ministry of Environment in the Provinces (there is Ministry of Environment in each province); Secretary to the Federal Government in-charge of the Ministry of Environment, (Federal Secretary); Director General Federal EPA (Pak-EPA); Heads of federal and provincial environmental protection departments; environmentalists and community representatives including Scientists. The functions and powers of the Council include formulation of National Environmental Policy, enforcement PEPA 1997, approval of the NEQS, incorporation of environmental considerations into National Development Plans and Policies and to provide guidelines for the protection and conservation of biodiversity in general and for the conservation of renewable and non-renewable resources.

The Federal Government has also formed the Federal EPA (Pak-EPA), which is headed by a Director General and has wide ranging functions given in PEPA 1997. These include preparation and co-ordination of National Environmental Policy for approval by PEPC, administering and implementing PEPA 1997 and preparation, revision or establishment of NEQS.

Federal EPA has over all jurisdictions over Environmental Impact Assessment or Initial Environmental Examination (EIA/IEE) issues. Federal jurisdiction is applicable to the projects as under:

- On federal land;
- Military projects
- Involving trans-country impacts; and
- Bearing trans-province impacts.

For all other cases, the concerned provincial Responsible Authority shall have jurisdiction. Federal EPA reserves the rights to review any Environmental Report at any time and to suspend the powers it has delegated to any Responsible Authority if it believes those powers have not been properly used. **Figure 2.1** shows the organizational chart of Pakistan Environmental Protection Agency.

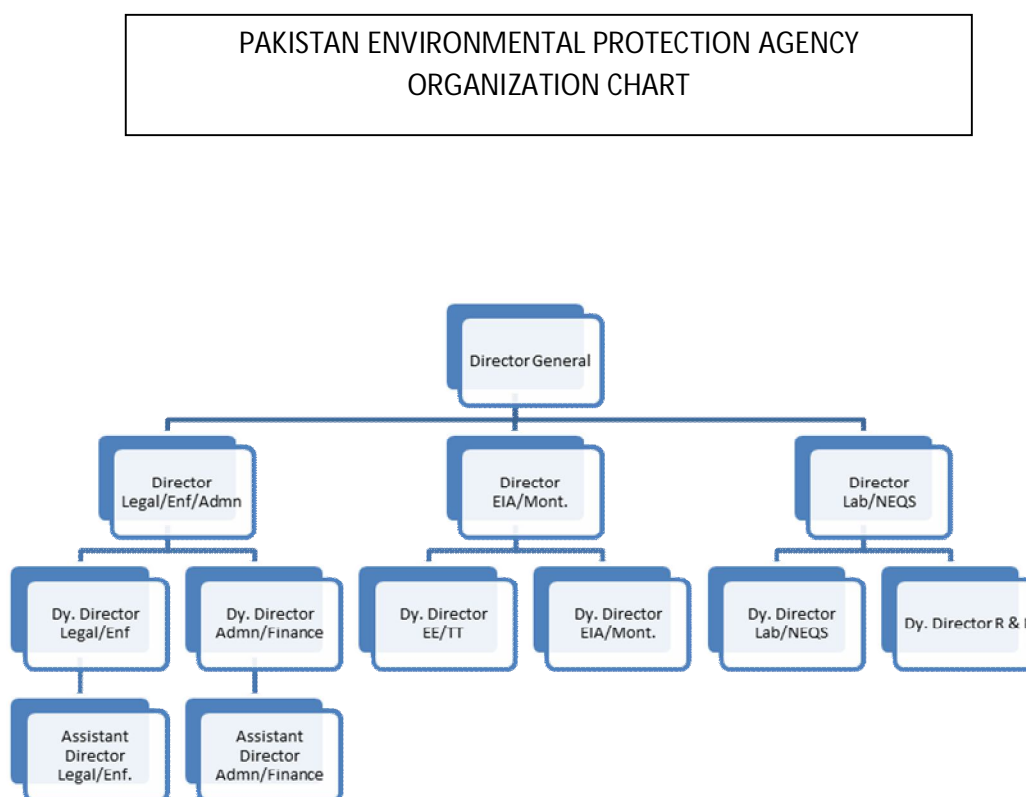


Figure 2.1: Organizational Chart of Pakistan Environmental Protection Agency

2.02 Provincial Government Institutions

Each provincial government has its own environmental protection institution responsible for pollution control. The provincial Environmental Protection Agencies or Environmental Protection Departments (EPAs/EPDs) are the provincial counterparts of the federal EPA, which is authorized to delegate powers to its provincial

counterparts. The Provincial Environmental Protection Agencies are formed by the respective provincial governments. A Director General who exercises powers delegated to him by the concerned provincial government heads the provincial EPA. The reports covering IEEs and EIAs are submitted to the concerned provincial EPAs for approval.

For public works, responsibility for IEE management & review and granting or refusing environmental approval, will be vested in the Planning and Development Departments (referred as P&Ds) responsible for economic and development planning at federal and provincial levels.

2.0.3 Local Government Institutions

At the district level District Environment Officer (DEO) is the responsible person to look after the environmental issues in all the sectors. The issues identified by the DEO are referred to the provincial government for legal proceedings. The DEO can take action against any development activity contributing in the environmental degradation of the country.

2.1 ENVIRONMENTAL LEGISLATION AND POLICIES

The development of statutory and other instruments for environmental protection has steadily gained priority in Pakistan since late 1970s.

2.2 PAKISTAN ENVIRONMENTAL PROTECTION ORDINANCE, 1983

The Pakistan Environmental Protection Ordinance, 1983 (PEPO 1983) was the first piece of legislation designed specifically for the protection of the environment. The promulgation of this ordinance was followed, in 1984 by the establishment of the Pakistan Environmental Protection Agency, the primary government institution dealing with environmental issues. Significant work on developing environmental policy was carried out in late 1980s, which culminated in the drafting of Pakistan National Conservation Strategy. Provincial environment protection agencies were also established at about the same time.

2.3 NATIONAL CONSERVATION STRATEGY (NCS), 1992

The Pakistan National Conservation Strategy (NCS) is the principal policy document for environment issues in the country that was developed and approved by the Government of Pakistan on March 1, 1992. The NCS works on a ten-year planning and

implementation cycle. It deals with fourteen (14) core areas, which are stated hereunder:

- i. maintaining soils in crop land;
- ii. increasing irrigation efficiency;
- iii. protecting water sheds;
- iv. supporting forestry and plantations;
- v. restoring rangelands and improving livestock;
- vi. protecting water bodies and sustaining fisheries;
- vii. conserving biodiversity;
- viii. increasing energy efficiency;
- ix. developing and deploying material and energy renewable;
- x. preventing / abating pollution;
- xi. managing urban wastes;
- xii. supporting institutions for common resources;
- xiii. integrating population and environmental programs; and
- xiv. Preserving the cultural heritage.

Based on the NCS, policies are being framed for institutional strengthening and human resource development for environmental protection, especially at the local and provincial level.

The NCS is a policy document that deals with the core environmental issues in Pakistan at macro level and recommends an action plan to address these issues. Project specified mitigation prescriptions cannot be expected in NCS document, however, the principles of environment protection, conservation and management provided in the NCS document have to be used as guidelines during the planning and execution of projects.

As a signatory to the Convention on Biological Diversity in 1992, it was also felt necessary for Pakistan to develop a national strategy for the conservation of biodiversity. Accordingly, the Government of Pakistan constituted a Biodiversity Working Group, under the auspices of the Ministry of Environment, to develop a Biodiversity Action Plan (BAP) for the country, which was completed after an extensive consultative process. The plan, which has been designed to complement the NCS and the proposed provincial conservation strategies, identifies the causes of biodiversity loss in Pakistan and suggests a series of proposals for action to conserve biodiversity in the country. PEPC has approved the action plan and steering committees at federal and provincial levels have been formed to implement it.

BAP recognizes that at project level Environmental Impact Assessment (EIA) is used as a tool to identify environmental impacts of a proposed project and to plan for reducing adverse impacts. BAP further stipulates that an EIA should be initiated at an early stage in project development cycle and that public participation in review of potential effects is important.

2.4 PAKISTAN ENVIRONMENTAL PROTECTION ACT (PEPA) OF 1997

A comprehensive legislation was evolved over-time to prepare and implement national environmental policies. It is entitled as “the Pakistan Environmental Protection Act, 1997 (PEPA 1997)”. The PEPA 1997 was enacted repealing PEPO 1983. The PEPA 1997 provides the framework for implementation of National Conservation Strategy, protection and conservation of species, wildlife habitats and biodiversity, conservation of renewable resources, establishment of Environmental Tribunals, appointment of Environmental Magistrates, Initial Environmental Examinations (IEE), Environmental Impact Assessment (EIA), and promotion of public education and awareness of environmental issues through mass media.

The PEPA, 1997 is the basic legislative tool empowering the Government to frame regulations for the protection of the environment. The act is applicable to a board range of issues and extends to air, water, soil, marine and noise pollution, as well as to the handling of hazardous wastes. Penalties have been prescribed for those contravening the provisions of the Act.

The following are the key features of the law that have a direct bearing on development project:

Section 11(1) states that “Subject to the provisions of this Act and the rules and regulations made there under, no person shall discharge or emit, or allow the discharge or emission of, any effluent or waste or air pollutant or noise in an amount, concentration or level which is in excess of the National Environmental Quality Standards”. The Pakistan Environmental Protection Agency (Pak-EPA), the body mainly responsible for enforcing the PAPA, 1997, has published National Environmental Quality Standards (NEQS).

Section 12(1) requires that “No proponent of a project shall commence construction or operation unless he has filed with the Federal Agency an Initial Environmental Examination (IEE) or, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained from the federal agency approval in respect thereof”.

Section 12(2)(b) The Federal Agency shall review the Environmental Impact Assessment report and accord its approval subject to such conditions as it may deem fit to impose or require that the Environmental Impact Assessment be re-submitted after such modifications as may be stipulated, or reject the project as being contrary to environmental objectives.

Thus, for a development project, it is required as per the regulations, that an EIA/IEE report be submitted to the Pak-EPA, and approval obtained before undertaking any construction activity.

Section 14 requires that “Subject to the provisions of this act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle, or import any hazardous substance except (a) under a license issued by the Federal Agency and in such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement, or other instrument to which Pakistan is a party”. Enforcement of this clause requires the Pak-EPA to issue regulations regarding licensing procedures and to define ‘hazardous substance’.

2.5 NATIONAL ENVIRONMENTAL QUALITY STANDARDS

In order to control the Environmental Pollution, the Government of Pakistan has laid down National Environmental Quality Standards (NEQS), 2000 for municipal and industrial liquid effluents, industrial gaseous emissions, motor vehicle exhaust and noise.

The NEQS were first promulgated in 1993 and have been amended in 1995 and 2000. The standards specify the following:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea.
- Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources; and
- Maximum allowable concentration of pollutants (2 parameters) in gaseous emissions from vehicle exhausts and noise emission from vehicles.

2.6 PAKISTAN (FEDERAL) EPA ENVIRONMENTAL ASSESSMENT PROCEDURES

Federal EPA has published a set of environmental guidelines for conducting environmental assessments and the environmental management of different types of development projects. The guidelines that are applicable to various development projects are listed below, followed by comments on their relevance:

- **Policy and Procedures of Filling, Review and Approval of Environmental Assessments, Pakistan Environmental Protection Agency, September 1997.** These guidelines define the policy context and the administrative procedures that govern the environmental assessment process, up to the approval of the environmental report. The section on administrative procedures has been superseded by the IEE/EIA Regulations, 2000.

- **Guidelines for the Preparation and Review of Environmental Reports, Pakistan Environmental Protection Agency, 1997.** The guidelines on the preparation and review of environmental reports specify the following for project components:
 - The nature of the information to be included in environmental reports;
 - The minimum qualifications of the EIA conductors appointed;
 - The need to incorporate suitable mitigation measures at every stage of project implementation; and
 - The need to specify monitoring procedures.
 - The terms of reference for the reports are to be prepared by the project proponents themselves. The report must contain baseline data on the project area, detailed assessment thereof, and mitigation measures.
- **Guidelines for Public Consultation, Pakistan Environmental Protection Agency, May, 1997.** These guidelines deal with possible approaches to public consultation and techniques for designing an effective program of consultation of that reaches out of all major stakeholders and ensures the incorporation of their concerns in any impacts assessment study.

2.7 PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (REVIEW OF IEE AND EIA) REGULATIONS, 2000

In exercise of the powers referred by the section 33 of the Pakistan Environmental Protection Act, 1997, Pakistan Environmental Protection Agency with the approval of, the Federal Government made the rules, namely: - Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

These regulations clearly defines the categories of the projects requiring an IEE/EIA, review fees by EPA, filing process of the environmental reports, public participation, decisions by EPA, conditions of approval, compliance reports and monitoring of the Environmental parameters, As per IEE/EIA Regulations, 2000 the review time period required for IEE is 45 days and for EIA is 90 days.

2.8 NATIONAL ENVIRONMENTAL POLICY, 2005

The National Environmental Policy provides an over reaching framework for addressing the Environmental issues facing Pakistan, particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio-diversity, decertification, natural disasters, and climate

change. It also provides directions for addressing the cross-sectored issues as well the underlined causes of Environmental degradation and meeting International obligations.

The National Environmental policy, while recognizing the goals and objectives of National Conservation Strategy, National Environmental Plan and other existing environment related national policies, strategies and action plans provides broad guidelines to the Federal Government, Provincial Government, Federally Administrative Territories and local Governments for addressing environmental concerns and ensuring effective management of their environmental resources.

The Provincial, AJK, Northern Areas, and Local Governments, however may devise their own strategies, plans and programs in pursuit of this policy.

Goal – The National Environmental Policy aims to protect, conserve and restore Pakistan's environment in order to improve the quality of life citizens through sustainable development.

Objectives – The objectives of the policy include: -

- Conservation, restoration and efficient management of environmental resources.
- Integration of environmental considerations in policy making and planning processes.
- Capacity building of Government Agencies and other stakeholders at all levels for better environmental management.
- Meeting International obligations effectively in line with the National aspirations.
- Creation of demand for environment through mass awareness and community mobilization.

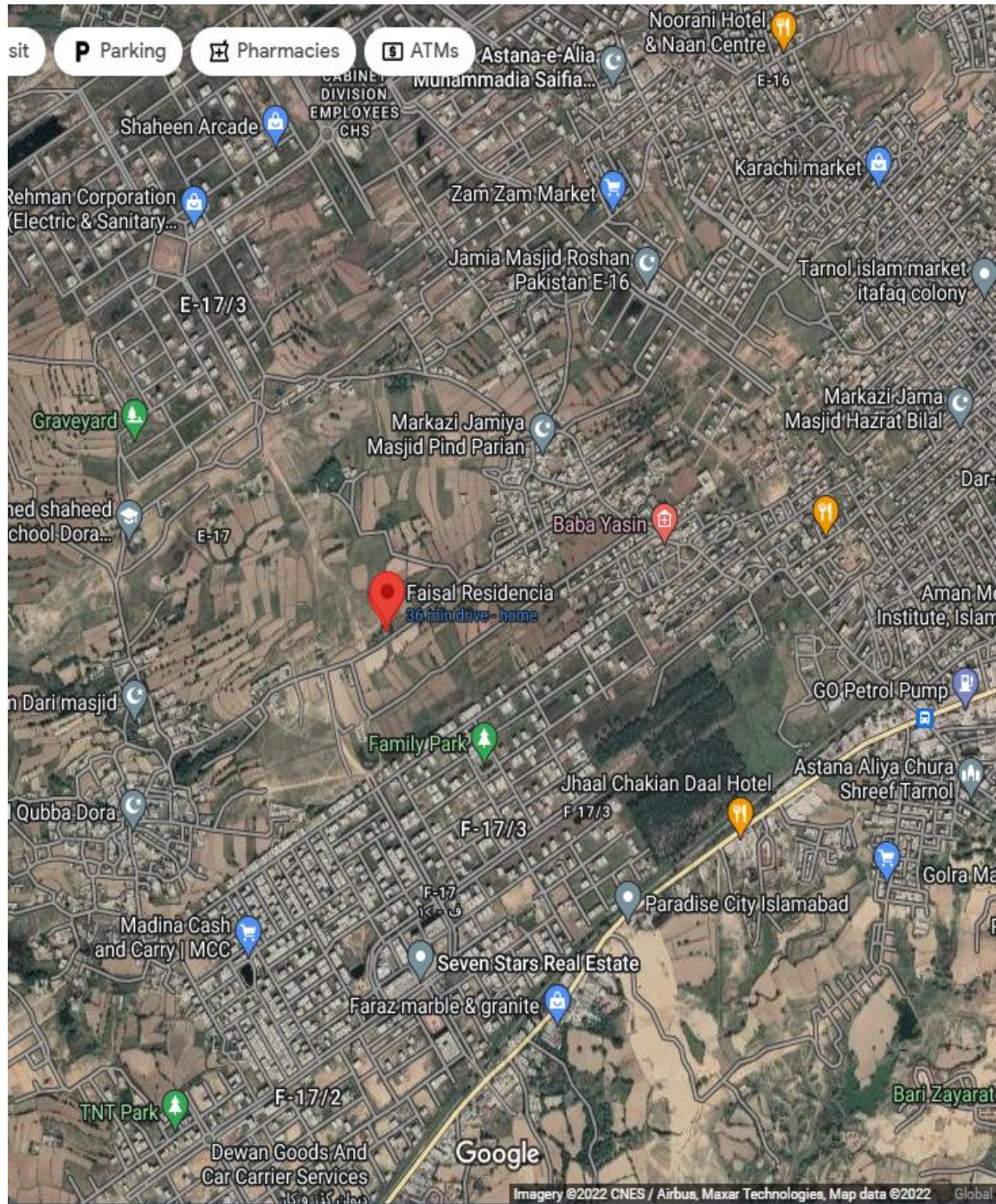
SECTION 3 PROJECT DESCRIPTION

3.0 General

The FAISAL RESIDENCIA, Islamabad is located at Sector E-17, Islamabad. The scheme has been planned to be launched primarily with the objective to provide housing plots to its members as well as general public at low cost. Currently the proposed project is under planning.

3.1 Location of the Project

The proposed site for Project is located at 33°38'25.2"N and 72°52'40.5"E in Sector E-17, Islamabad. It is situated adjacent to Cabinet Division Employees Cooperative Housing Society Sector E17 & MPCHS Multi Professionals Cooperative Housing Society F 17 on the East, open land / Nala and Gulshan E Sehat E 18 on the West, Cabinet Division Employees Cooperative Housing Society Sector E17 on the North and MPCHS Multi Professionals Cooperative Housing Society F 17 on the South and Pind Parian and have access to Kohat Fateh Jang Road.



3.2 Cost of the Project

The construction cost of Faisal Residencia is estimated to be Rs. 1.83 Billion excluding the cost of land.

3.3 Alternatives Considered

This section covers the project alternatives which were examined for the proposed Housing Scheme in Sector E-17, Islamabad. An analysis of the 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 optimal 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.
3. Alternative technology.

3.3.1 No Development Option

The proposed project is development of Housing Scheme. This housing scheme will provide developed plots to members as well as general public. It will help in developing the area and will give quality living standards. The proposed project will provide additional income and gainful employment to the nearby population. The 'No-Project' option, if taken, will prevent the area from developing.

Other impacts of the 'No-Project' option would be loss in employment and infrastructure development in the project area, as the project is likely to create some jobs and improve the existing infrastructure of the area. From the environmental point of view, this option would result in a loss of opportunity in further improvement of the environmental management of the area, through generation of environmental baseline data, and the mitigation and monitoring plans.

3.3.2 Alternative Site Option – Site Selection Criteria

In reference to the Project Site alternatives, several lands were evaluated. The final selection of site was based on following criterion:

Disturbances to Urban Development:

Due to excessive construction activities and heavy traffic no any neighboring community will be disturbed as the project site is away from them and will be fenced.

Accessibility:

The site should be accessible from a permanent road to allow ready transportation for the residents of FAISAL RESIDENCIA.

Water Supply:

Availability of adequate water supply, which should also, meets drinking water standards.

Soil conditions for civil structure:

Suitability and stability of soil conditions required for the 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 IESCO/WAPDA for an uninterrupted supply of power, required for the society.

Conclusion:

In view of all above criteria, it was concluded to construct the society at Sector E-17, Islamabad.

The geographic position of the proposed project is very ideal which connects it to the transportation infrastructure of the country. The proposed project location is at Main Fateh Jang Road which is providing direct access to the M-1 Islamabad – Peshawar Motorway, Rawalpindi City as well as Islamabad. Remaining proposed site doesn't possess such a broad spectrum of commercial, industrial and management benefits.

3.3.3 Technology Alternatives

a) WASTE HANDLING

Only solid waste produce by the proposed project will be Domestic Solid Waste which could be easily disposed by transporting through own vehicles, to waste disposal site of CDA.

b) LIQUID WASTE WATER TREATMENT

Only liquid waste which will be produced by the proposed project will be domestic waste water, which will be first disposed in the Septic Tank and then treated in Sewerage Treatment Plant and then disposed in the natural flowing nullah nearby.

3.4 Project Administrative Jurisdiction

The proposed project falls in the administrative jurisdiction of Capital Development Authority (CDA).

3.5 Description of the Proposed Project

The FAISAL RESIDENCIA, Sector E-17, Islamabad site encompasses 1220.60 Kanals of land which will be developed for residential and commercial purpose. The FAISAL RESIDENCIA will consist of development of 1164 Plots for residential and 8 plots for blue area / commercial area, open space/parks, public building areas, grave yard, and roads etc. The Director, FAISAL RESIDENCIS will give plots to the allot tees, who will construct their houses individually. All construction activities have been carried out as per standards and specifications of modern construction techniques and the sponsor will ensure implementation of standards during houses construction.

The overall Housing Scheme will consist of:

- 1164 Plots on which houses will be constructed;
- Road Network; Main Avenue 135' 120' 100', Service Roads 60', Minor Roads 50' & Streets 40' wide;
- Surface water drainage;
- Sewerage network and Sewage Treatment Plant;
- Water supply Network including tube wells, overhead tanks and Water purification/filtration plant for drinking water;

- Electricity distribution network as per IESCO/WAPDA standards;
- Street lights;
- Sui-Gas distribution network as per SNGPL standard;
- Telecommunication network (underground);
- Mosque, Commercial Area, Public Building and
- Parks/Green areas.

3.5.1 Land Acquisition

The FAISAL RESIDENCIA already owns 1220.60 Kanals of land through direct purchase. Compensation to the land owner has been made at the time of purchase.

3.5.2 Number and Sizes of Plots

FAISAL RESIDENCIA will consist of:

Sr. No.	Plot size	Number of Plots
1	25 x 50	205
2	30 x 60	451
3	30 x 70	06
4	35 x 70	190
5	40 x 60	08
6	40 x 70	10
7	40 x 80	167
8	50 x 90	127
Total		1164

PLOT SCHEDULE IN BLUE AREA

Sr. No.	Plot size	Number of Plots
1	265 x 330	06
2	175 x 330	02
Total		08

3.5.3 Land Use

The total area of the FAISAL RESIDENCIA, ISLAMABAD will be developed as follows:

Sr. No.	Land Use	Area (Kanals)	Percentage	Planning Standards For Zone-II
1	Residential	495.76	48.49	Not more than 55%
2	Road	317.96	31.10	Not more than 23%
3	Commercial	51.12	5.00	Not more than 5%
4	Public Buildings	51.63	5.05	Not more than 5%
5	Park & Open Space	105.92	10.36	Not more than 10%
6	Total	1022.39	100.00	
7	Blue Area	198.21		
Grand Total		1220.60	100.00	

3.5.4 Time Schedule

The initial town planning which includes layout plan and broad scale design of Residential Area, Commercial Area, Car Parking Areas, Green Spaces, Graveyard, and public buildings has been done for the FAISAL RESIDENCIA. Overall Time schedule is given below:

S. No.	Description	Year
1	Project Planning	2022
2	Construction Scheduled	2023
3	Construction completed	2030

3.5.5 Design Criteria for Development

All the construction activities of the FAISAL RESIDENCIA Islamabad will be carried out according to the schedule and will be completed in time. The utility services that will be provided at the FAISAL RESIDENCIA include Water Supply System, Electricity Network, telecommunication System, Network of Roads & Streets, Water Purification/Filtration Plant, Sewerage Network and Sewage Treatment Plant.

Following design criteria is being followed by the FAISAL RESIDENCIA Islamabad for operation of the scheme:

A) Water Supply:

(Standards adopted from National Reference Manual on Planning & Infrastructure Standards (Environment & Urban Affairs Div.), Ministry of Housing & Works, Govt. of Pakistan).

SCHEME AREA	=	1220.60 Kanal
RESIDENTIAL AREA	=	495.76 Kanal
(i) Residential Plots	=	1164
(ii) Houses hold size	=	07 persons per h.h
(iii) Population	=	07X 1164 = 8148
(iv) Add 40 % extra	=	3259
(v) Total Population	=	3259 + 8148
	=	11407 persons
Gross Density per acre Acre		11407/ 152.57 = 74.76 persons /
Per capita Consumption	=	60 gpcd
Water Demand (11407 X 60)	=	684420 Gallons per Day I

■ Consumption For non- Residential area per acre/day

area per acre/day	=	1000 Gallons
non- Residential area	=	423.88 kanals
52.98 acre x 1000/ day	=	52980 Gallons / dayII

■ Educational Institutes

Primary School

8 gallons per capita per day
for 15% of total population
of the scheme. = 13688 Gallons per Day....III

Colleges

8 gallons per capita per day
for 5% of total population
of the scheme. = 4563 Gallons per Day.... IV

▣ **Mosque**

for 20% of population
@ 3 g/d/ namazee =6844 Gallons per Day.....V

▣ **Requirement for Commercial Area**

10 gpcd 20 % of population = 22814 Gallons per DayVI

▣ **Health Unit (For 100 Beds)**

100 Gallons / bed / day = 10000 Gallons per Day.....VII

Total Average Demand = I+II+III+IV+V +VI+VII

= **7,95,309** Gallons per Day

Maximum Demand (1.5 times) = 1192963 Gallons per Day.

Peak Demand (2 times) = 1590618 Gallons per Day.

Details Of Sources Of Water Supply :-**1. Proposed tube well sites**

VES - 01	=	3500 g/h
VES - 02	=	3500 g/h
VES - 03	=	3500 g/h
VES - 04	=	3500 g/h

$$\begin{aligned}
 & \text{VES - 05} &= & 3500 \text{ g/h} \\
 &= & 17500 \text{ g/h for 18 hours running.} \\
 &= & \mathbf{315000} \text{ g/dI}
 \end{aligned}$$

2. Water Reservoir/ Small Dam :-

$$\begin{aligned}
 & \text{(a). Area under Water Reservoir} &= & 5.30 \text{ kanal} \\
 & &= & 28832 \text{ Sft.} \\
 & \text{(b). Depth Water Reservoir} &= & 25 \text{ ft.} \\
 & \text{(c). Capacity} &= & 28832 \times 15 \\
 & &= & \mathbf{432480} \text{ Cft} \times 6.228 \\
 &= & \mathbf{2693485} \text{ gallons} \\
 & \text{(d). Expected Supply from Water Reservoir} &= & 20 \% \text{ of Capacity} \\
 & &= & \mathbf{538697} \text{ gallons..... II}
 \end{aligned}$$

3. Total Expected Yield :-

$$\begin{aligned}
 &= & \mathbf{(I + II)} \\
 &= & \mathbf{853697} \text{ g/d}
 \end{aligned}$$

Demand :-

$$\text{Average Daily Demand} = \mathbf{7,95,309} \text{ g/d.}$$

$$\begin{aligned}
 & \text{Surplus Supply :-} \\
 &= & \mathbf{(8,53,697) - (7,95,309)}
 \end{aligned}$$

$$= \mathbf{(58,388)} \text{ gallons}$$

B) Sanitary Sewerage System

$$\text{Per capita Consumption} = 60 \text{ gpcd}$$

$$\text{Water Demand (11407 X 60)} = 684420 \text{ Gallons per Day I}$$

■ **Consumption For non- Residential area per acre/day**

$$\text{area per acre/day} = 1000 \text{ Gallons}$$

$$\text{non- Residential area} = 423.88 \text{ kanals}$$

$$52.98 \text{ acre x } 1000 / \text{ day} = 52980 \text{ Gallons / dayII}$$

■ **Educational Institutes**

Primary School

8 gallons per capita per day
for 15% of total population
of the scheme.

$$= 13688 \text{ Gallons per Day....III}$$

Colleges

8 gallons per capita per day
for 5% of total population
of the scheme.

$$= 4563 \text{ Gallons per Day.... .IV}$$

■ **Mosque**

for 20% of population
@ 3 g/d/ namazee

$$= 6844 \text{ Gallons per Day....V}$$

■ **Requirement for Commercial Area**

$$10 \text{ gpcd } 20 \% \text{ of population} = 22814 \text{ Gallons per Day . .VI}$$

■ **Health Unit (For 100 Beds)**

$$100 \text{ Gallons / bed / day} = 10000 \text{ Gallons per Day...VII}$$

$$\text{Total Average Demand} = \text{I+II+III+IV+V +VI+VII}$$

$$= \mathbf{7,95,309 \text{ Gallons per Day}}$$

a) **SEWERAGE & SEWAGE DISPOSAL**

GENERAL

There exists no sanitary / sewerage system in the vicinity of the project area, therefore independent sewerage will be planned for the area.

The volume of sanitary sewage from an area depends upon the population, The characteristics of the area, water usage, and underground water conditions and material of joints etc. Per capita average daily sewage flow at 80% of water supply from residential area has been taken into account.

Sewage Collection System

Disposal of sewage from individual plots will be through house connections which will be lead into the main sewer lines through a series of lateral and sub-main sewer lines connected through manholes as detailed below.

- a. House Sewer Connection: - Each individual plot will be provided with a separate house sewer connection. This will start from within the plot premises and will terminate into a Manhole. Under no circumstances this sewer will have a smaller diameter than 6 inches. The house sewer connection will be located at the pre-designed point near the gate of plot.
- b. Lateral Sewers: - Lateral sewers will run across the streets connecting housesewer connections to the Main/Sub Main sewers running on the other side of the road. They will start and terminate through Manholes.
- c. Main/Sub Main sewers: - These will run on one side of the road collecting sewage from houses connections as well as laterals conveying sewage from the other side of the road in addition to this they will also convey sewage from other sub mains converging on to it. All connection will be made through Manhole.
- d. Sewerage Pipes: - All main / sub main / laterals / house connection pipe will be Pvc / Rcc pipes. These pipe will be bell and spigot types less house connection pipes, which will be connected with 'O' rings. Prior to the backfilling, each section will be plugged and tested under 5 feet head of water for a minimum of 1 hour.

SEWAGE FLOW

Average Flows

Average sewage flow expected from the project is as under:-

- Average Water Supply = Sum of Average daily water demands for domestic and institutional / commercial purpose.

- Average Water Demand = **795309** g / d
- Average Sewage Flow = 80% of Average Water Demand
- = **795309** x 0.80 = **636247** g / d
- Infiltration @ 10% = 63625 g / d
- Total sewage flow = 636247 g / d - (63625 g / d) = 572622 g/ d
- = 1.055 Cusec
- (1 cusec = 22,600 g/h
- 22,600 X 24 = 5,42,400 g/d)

Peak Flow

$$\begin{aligned}\text{Peak Flow} &= 2.0 \times 1.055 \\ &= 2.11 \text{ Cusecs}\end{aligned}$$

SEWAGE COLLECTION

Accounting for topography of the Area sewage would be collected at one point.

SEWAGE TREATMENT & DISPOSAL

Sewage from the housing Project will be concentrated at one point for primary treatment and after secondary treatment shall be disposed of in the natural drain passing near the scheme from West to South for disposing off the rain water flowing adjoining the site.

The treatment will be provided as under:

Preliminary

Preliminary treatment in the form of bar screens and grit Chamber is proposed (Septic Tanks).

Primary Treatment

Primary treatment up to 50 % would be in the form of Inhofe tanks.

Polishing of Effluent

The effluent from the Inhofe tanks is proposed to be polished by passing it through sand filter beds. During initial stage of development / colonization the effluent will be utilized within the housing for arboriculture / horticulture and when quantity of effluents exceeds the side use, the same will be disposed to the nala passing adjoining site.

STORM SEWAGE SYSTEM

- a. **Run off:** - For the purpose of calculation maximum rainfall intensity has been taken as 3 inches per hour. Run off has been calculated and details are as under.
- b. **Flow Direction:** - Based on the contour map flow direction will be specified.
- c. **Drainage System:** - As the lay of the ground permits easy and simple surface drainage, therefore the drainage system will be designed accordingly.
- d. **Disposal of Surface Runoff:** -Since natural nala pass along the site of **"FAISAL RESIDENCIA"** and the gradients are adequate for providing natural disposal, therefore surface runoff will be disposed of in this nala.

CONCLUSION

The entire sewerage system of **"FAISAL RESIDENCIA"** will be designed on the most modern methods and will pose no threat to the environment.

C) Solid Waste Management

General

Solid wastes are generally taken to include all non-gaseous non-liquid wastes resulting from the wide range of community, Commercial and industrial activities. Effective solution to the problems of the solid wastes collection, treatment, conversion, re-use and disposal is a basic health requirement, otherwise indiscriminate dumping of these wastes in a populated community will cause many serious health hazard problems.

QUANTITIES OF SOLID WASTE

The amount of solid waste generated by a community depend upon the socio – economic level of that community and such amounts by each person each day are increasing as a result of social, economic and technological changes. Considering the local socio – economic level of our urban communities such amounts are likely in the range of 0.5kg to 0.8kg per capita per day.

Total Population of FAISAL RESIDENCIA will be 11407. Therefore the minimum quantity of solid waste generated in the housing project will be as under:

- Population of the Housing Project = **11407**
- Minimum solid waste generated
Per capita per day = 0.5 kg/p/d

- Total quantity of solid waste
Generated at project area per day = **5704** kgs.

CHARACTERISTICS OF SOLID WASTE

The most significant Characteristics of Solid Waste are density, moisture, combustible and non – compatible contents and thermal values and each of these characteristics varies widely. The Characteristics are mainly affected by seasonal and local variable type of collection system, standard of living, extent and type of commerce and

industry involved, prevailing climate and other considerations. The density of solid waste is an important criterion in the content of planning for collection system. Its weight is reasonably estimated as 250 kgs per cubic meter.

SYSTEM OF SOLID WASTE MANAGEMENT

The System of Solid Waste Management can be divided in the following operations:

- Storage
- Collection
- Disposal

➤ Storage

The refuse will be temporarily stored in the special paper bags by inhabitants of each residential unit and will be placed outside the premises at a place designed in each house. The bags will be provided by the management of the housing project at reasonable cost. The size of the paper bag will be kept within the limits that it could be easily and functionally handled by the collection crew.

➤ Collection

a) Primary Collection Point (Dust bins / Bags):

The frequency of collection depends on the quantity of refuse and time of the year and other factors. For every ten houses, a fiberglass bucket / container shall be provided on Streets and Roads.

b) Secondary Collection Point (Filth Depot Plot) :

On daily basis the sanitation crew shall collect the waste from primary collection points and transport this to secondary collection point of the scheme which is located on the plot reserved for solid waste collection

➤ **Disposal Systems**

Refuse disposal methods include open dumping incineration, grinding and discharge into natural stream, sanitary fill, reduction and fermentation or biological digestion. Among these methods, three generally accepted methods after treatment and disposal of solid waste are: sanitary land filling, composting and incineration.

➤ **Sanitary Land Fill**

The sanitary land filling system of refuse disposal is simple, effective, inexpensive and most desirable under the local circumstances. A properly engineered, managed and controlled sanitary land filling operation can be successful and economical besides meeting public acceptance and health hazards and in addition is capable of reclaiming nonuse able land for recreational and other development.

➤ **Composting**

Composting is the aerobic thermophilic decomposition of solid wastes to produce a relatively hums like material with principle by – products, as carbon dioxide, water and heat. The end product is a good builder or Conditioner containing small amounts of major plants nutrients. The system is relatively costly.

➤ **Incineration**

Incineration are designed to burn refuse under control, nuisance free condition at relatively high temperatures which result in an inert organic - free residue that can be readily disposed of in a land fill.

ADOPTION OF METHODS FOR DISPOSAL OF MUNICIPAL WASTE

For the disposal of municipal waste above three systems will be adopted. The refuse collected at central filth depot will be stored out in three categories.

- Refuse suitable for preparation of compost
- Hospital waste
- Remaining

The refuse suitable for preparation of composting will be dumped at composting site and compost will be used in green areas of housing project.

The hospital waste will be incinerated and then mixed with remaining refuse to transport to the main sanitary fill site of CDA ISLAMABAD.

CONCLUSION

The entire solid waste management of “**FAISAL RESIDENCIA**” will be designed on the most modern methods and will pose no threat to the environment.

D) Transportation / Traffic Impact

- i) The site is well accessed by transportation and road network of region. Distant from congested and traffic jams of city centers, the proposed project shall enjoy tension free relevant activities in a more relaxed and open environment and shall share the burden of congested ailing and degenerated cities. It shall be destination of that segment of population which desire decent residence at minimum cost and at a reasonable distance from city.

- ii) Mixed residential activities (being a social responsibility of the urban development Sector) in new developments shall be encouraged by addition of this project in the Field. Initial years may attract people relevant to surrounding area but these will be In stabilized as the development in adjoining area matures. The Site Plan and Layout Plan indicates the local accessibility to the site and pattern of circulation system likely to be developed as a result of this residential Project.

- iii. Site location with respect to network and major regional destinations, beyond any doubt, is appropriate, benefitting the interest of the region at large and shall remain instrumental against wild urban sprawl. Convenient location, well accessed from the main network and at the same time strategic placement with respect to major traffic generators is likely to improve access to community mobility and economic growth and cause least negative impact on the transportation network around.

Expected Traffic Generation

- i. Comparison of traffic volumes cannot be done with high degree of accuracy, due to varying traffic data collection techniques and analyzing techniques. Based upon vehicle registration data a 6% growth rate is assumed in District Islamabad . Assumption of Growth rate in project area was established after detailed study. Analysis indicates that traffic congestion on Rawalpindi Fatehjang / Kohat Road has not saturated to an extent of concern and it can easily accommodate more traffic. Rapid development in surrounding and accessibility to Rawalpindi Fatehjang Road has increased by recent extension of metaled portions and improvement of Rawalpindi Fatehjang/ Kohat Road. Commercial areas other than Rawalpindi Fatehjang/ Kohat Road are also serving at non-saturation and study corridors in adjoining areas have restricted Right of Way (ROW). If maximum facilities are to be provided and maximum Right of Way to be utilized, the compound annual growth rate for the project should not be more than 10% for first ten years, i.e. 2022 to 2032, and 20% for year 2032 to 3042 for the scheme.

ii. **Traffic Projections:**

As per discussions with concerned officials 16 hours traffic counts were adjusted to 24 hours traffic volumes by an 6% increase which is derived from 24 hours one day traffic count. Traffic volumes on adjoining junctions with projection upto 10 ,15 and 20 years Growth rates in project area were applied as follows:

<u>Location</u>	<u>Year</u>	<u>Annual Growth Rate</u>	<u>Growth Factor</u>
District			
ISLAMABAD	2020 to 2023	6% (estimated)	1.65
	2023 to 2026	3% (estimated)	1.34
	2026 to 2029	2% (estimated)	1.10
	2029 to 2032	2% (estimated)	1.10
	2032 to 2035	2% (estimated)	1.10

(Seasonal factor for school holidays 10 %).

As per international practice of using ITE Standards and methodology being applied in most of similar cases, we have worked out the traffic likely to be generated by the year 2032. It is estimated that the project shall generate daily volumes as per table below:

Table # I	Distribution of daily vehicle journey for residential upto 2030	
S. No.	Usage	Vehicle journeys a day
1	Residences	45000
2	Ancillary	52000

- iii. As per our estimate it is expected that when the project becomes functional by the year 2030 and its clientage is fully established which is more likely to take time, say the year 2035, at that stage the project shall generate 37500 vehicle journeys a day. Since it shall be generating residential opportunities within the premises, around 10% of the trips would be internal and external trips shall be 35000 vehicles a day. Such a period of maturity of project shall be partially associated with full / saturated habitation of adjoining localities and partially on reliance of traffic attracted from city area.

The location of project at the edge of expanding / curtailed urban area suggests that its major clientage shall be from adjoining localities which shall not use private or

public transport for their visits, therefore, the ratio of users and non-users of vehicles shall be 75% and 25% respectively.

Appraisal Of Road Network Around

- i. Main approach to the project area which link it up with Rawalpindi Fatehjang / Kohat Road (G.T Road) which is dual carriageway serving as major link between Rawalpindi Fatehjang . Right of way of this road is 100 ft.
- ii. On the basis of above analysis we are justified to establish that current road network around and approaches to the project shall bear no stress as a result of

implementation of the project. The project shall add negligible and non-mentionable fraction to the present traffic flow and consequently no improvement of roads or junctions shall be needed.

Traffic Management Plan:

- a) The Traffic Management Plan describes procedures and protocols for site access, traffic routing and management, policy with respect to vehicles and transportation, Public safety is primary goal of this plan.

1. Site Access:

- (i) In the interest of site security and public safety, access to site will be controlled and monitored by usage of signs and gates where appropriate. Facilities that potentially present danger to persons or wildlife (such as electric sub-station and settling ponds) will be fenced or barricaded as appropriate to prevent access.
- (ii) Where necessary more frequently used routes CCTV Cameras will be installed at appropriate locations.
- (iii) Signage posted near all construction sites will be necessary.
- (iv) 40 km/ hr speed limit within or near the project site.
- (v) In accordance with the occupational health and safety regulations for public roads, usage of flashing devices on vehicles / machinery and equipment will be ensured who cross, travel on roads.

2. Speed Limits:

- (i) Speed limits will be enforced along the main and access roads (max. 40 km/ hr reduced to 20 km/ hr at blind corners and bridge crossings).
- (ii) Residents will be educated on safety including traffic protocols and speed limits during mandatory orientation.

3. Communications and Notification Protocols:

- (i) Traffic along main roads will be radio controlled. Road location/ travel direction signs /road abbreviations/ kilometer at appropriate locations. It will require only single lane closures. A public notice will be posted at multiple locations to communicate the residents of any new activity.

4. Traffic routing and volumes:

- (i) Commercial traffic will be redirected to ensure routing it around the community and potential impact to the community will be minimized.

E) Electrical Works

The design criterion for the electrical works will be in compliance with the requirements of IESCO/WAPDA. Street lights will be provided and their maintenance will also be carried out by the management of the FAISAL RESIDENCIA.

F) Sui Gas

Design criterion for lying Sui Gas will be as per SNGPL's requirement.

G) Telecommunication

Telephone facility will be provided by the PTCL. An underground cable will also be provided for electronic media.

H) Mosque, Community Centre, Commercial Area and Parks

There will be mosques, commercial centers and parks at the FAISAL RESIDENCIA.

There will be Khateeb, One Mo'azin, and One Farash in each mosque; all of them will be employed by the Management Committee of FAISAL RESIDENCIA.

The community centre will be used for functions and programs of residents of FAISAL RESIDENCIA.

3.5.6 Population of FAISAL RESIDENCIA Islamabad

To work out the total population of the **“FAISAL RESIDENCIA”** House hold size has been assumed to be 7- persons per household. It has been observed that about 1/3rd owners of the houses rent out their residence or portions of their houses. People coming for business and jobs should also be considered.

Therefore while proposing basic facilities and amenities in The scheme 40% excess population has been added to the original population of residential plots.

The total residential population and its density / acre is worked out as under:

SCHEME AREA	=	1220.60 Kanal
RESIDENTIAL AREA	=	495.76 Kanal
(i) Residential Plots	=	1164
(ii) Houses hold size	=	07 persons per h.h
(iii) Population	=	07X 1164 = 8148
(iv) Add 40 % extra	=	3259
(v) Total Population	=	3259 + 8148
	=	11407 persons

3.6 Proposed Schedule for Implementation

The construction of the proposed Project will be completed by 2030.

3.7 Vegetation

The area does not support any significance number of trees and is mostly uncultivable; the predominant vegetation is Sanatha shrub.

3.8 Restoration and Rehabilitation Plan

The proposed site is vacant with no any cultivation and infrastructure on it and only Sanatha shrub is present. Therefore, restoration and rehabilitation plan in this regard is not required.

SECTION-4

BIOPHYSICAL ENVIRONMENTAL BASELINE

4.0 General

The proposed Project has been studied with respect to physical, biological and socio-economic environmental conditions. The objectives of establishing baseline environmental profile include: (a) determine pre-project state of affairs which can be used to assess post-project environmental conditions – both for better and worse; and (b) provide maximum information to the proponent and decision-makers for informed decision making.

In order to establish baseline conditions for the EIA study of Faisal Residencia, the information about the various environmental parameters was gathered from Government Departments, through review of previous and journals, and site visits. The Socio-Economic survey was conducted to get information about the socio-economic conditions of the communities living in the Project Area. Different tools such as questionnaire and focus group discussions were used to solicit their view points (including concerns and suggestions) about the proposed project.

4.1 Islamabad

Islamabad Capital Territory is the capital and the ninth largest city in the country which is spread over an area of 906 sq. km., and is divided into three segments; namely, (i) Islamabad Urban Area, including institutional and industrial area, covering 220 sq. km. (ii) Islamabad Park is occupying 220 sq. km., and (iii) Islamabad rural area are measuring 446 sq. km.

Islamabad Capital Territory is divided into eight zones: Administrative Zone, Commercial District, Educational Sector, Industrial Sector, Diplomatic Enclave, Residential Areas, Rural Areas and Green Area. Islamabad city is divided into five

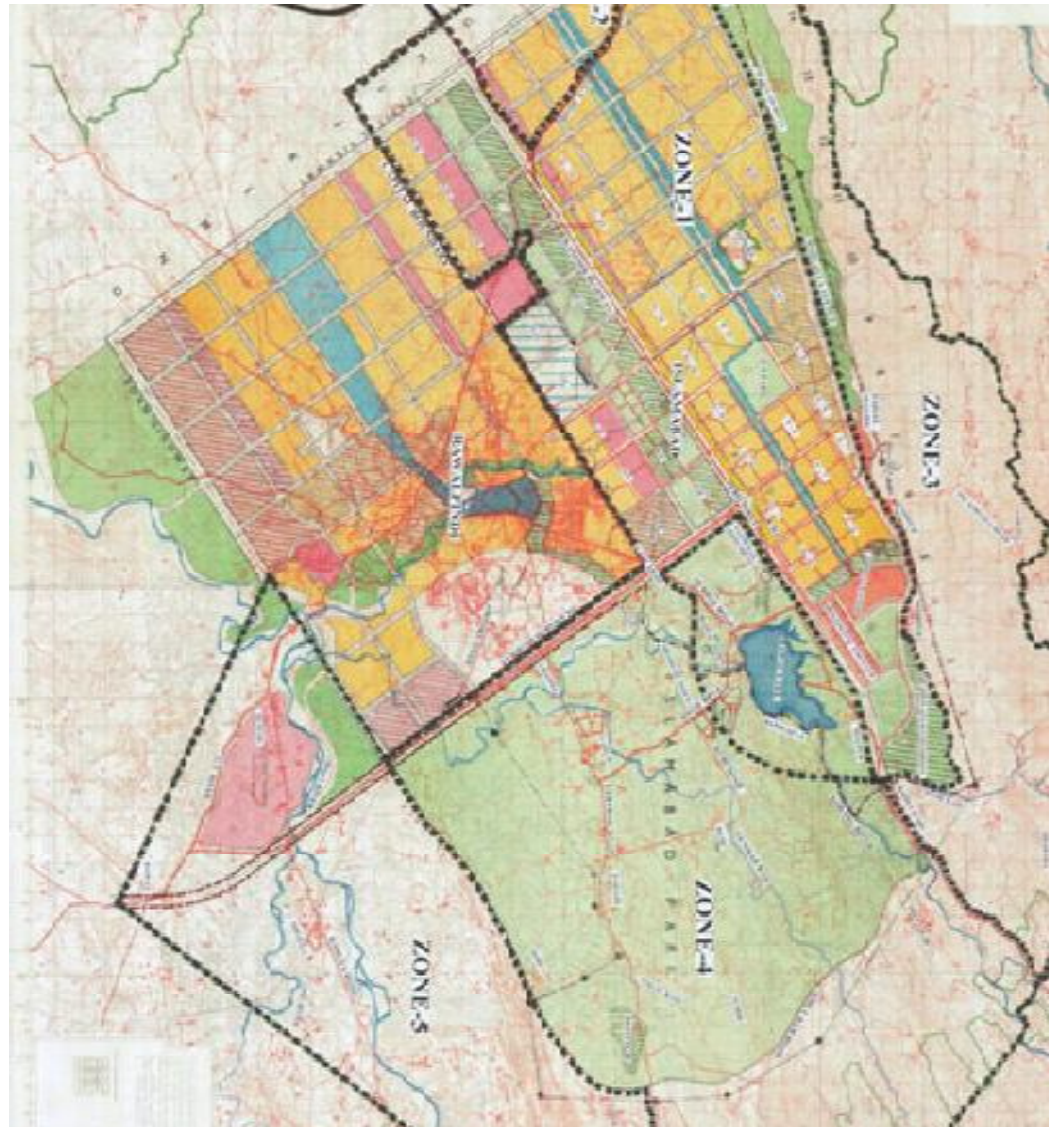
major zones: Zone I, Zone II, Zone III, Zone IV, and Zone V. The rural area of Islamabad encompasses 132 villages and administratively consists of 12 Union Councils. Islamabad has been planned in parallel belts with Administrative Sector, Diplomatic Enclave, Public Building Area, Residential Sectors, a Commercial area called the Blue Area and Industrial areas.

Islamabad is located at 33.43°N 73.04°E, at the northern edge of the Potohar Plateau and at the foot of the Margalla Hills in Islamabad Capital Territory. Its elevation is 540

meters (1,770 ft.). The modern capital and the ancient Gakhar city of Rawalpindi stand side by side and are commonly referred to as the Twin Cities, where no exact boundary exists between the two cities.

To the northeast of the city lies the hill station of Murree and to the north lies the Haripur District of Khyber Pakhtunkhwa. Kahuta lies on the southeast, Taxila, Wah Cantt, and Attock District to the northwest, Gujar Khan, Rawat, and Mandrah on the southeast, and the metropolis of Rawalpindi to the south and southwest. Islamabad is located 120 kilometres (75 mi) SSW of Muzaffarabad, 185 kilometres (115 mi) east of Peshawar, 295 kilometres (183 mi) NNE of Lahore, and 300 kilometres (190 mi) WSW of Srinagar, the capital of Indian Kashmir.

The city of Islamabad expands on an area of 906 square kilometres. A further 2,717 square kilometres area is known as the Specified Area, with the Margalla Hills in the north and northeast. The southern portion of the city is an undulating plain. It is drained by the Kurang River, on which Rawal Dam is located.



4.2 Physical Environment

The physical environment includes topography, geology, and soils, seismology, climate, surface water, ground water ambient air quality and noise levels.

4.2.1 Topography

Islamabad is located at the edge of the Potohar Plateau and at the foot of the Margalla Hills in Islamabad Capital Territory. The Potohar Plateau has an uneven table and land is gradually rising in elevation from 500 to 600 meters above the sea level, and the highest point is 1,600 meters above mean sea level. The land gradually slopes towards the South. The land is composed either of alluvium (clay or silt) or of gravel caps. The plains are formed of alluvial deposits laid by the past and the present river systems of varying thickness. A large part of the area is undulating, and at various places, it is badly dissected by gullies and ravines. The Korang stream has been dammed at a place named Rawal to form the Rawal Lake. Another dam has been built on the Soan River to form the Simly Lake. The Potohar plateau is a well-defined physiographic unit of Pakistan between the Indus basin plain and the foothills of Himalayas. It covers about 11,200 km² area bounded by Kala Chitta and Margalla hills in the North and the Salt Range in the South, Indus River in the West and Jhelum River in the East. The plateau has the level to undulating topography with scattered gullies and gorges created through active water erosion.

The topography of Islamabad consists of plains and mountains. The northern part of the metropolitan area comprises mountains terrain of the Margalla Hills, and Rawal Lake lies in the northeast just below the hills. The southern portion of this city is an undulating plain drained by Korang River followed by its tributaries. Towards east is a relatively flat area with bare soil and settlements.

The Project area seems plain with no any river or mountains near it. Kohat Fateh Jang Road is located near the site.



Topography Map of the Project Area

4.2.2 Geology and Soils

The Potohar region has a complex geological history of mountain formation, alluvial-depositions, and erosion cycles. Limestone is the characteristic rock of Margalla range. In age, it ranges from the Jurassic to Triassic. It is usually reddish or bluish-white in colour, mixed or alternating with its beds of red or bluish clay or shades or sandstones. Adiala, Dhamial - Loibher forests are situated over alluvial deposits. The deposits contain small sized rounded pebbles of sandstone, quartzite or granite and sand mixed or alternating with clayey deposits. They have been described as alluvial deposits, but it is equally probable that they have a glacial origin.

The ridges and valleys in the area are formed by alluvial deposits from the hills that have been buried in the ridges of sandstone and covered by interbedded sandy silt and limestone gravel. Most of the urbanization in the region is primarily focused on the Piedmont bench area dissected more into south side. The southern area which comprises sandstone, mudstone and conglomerate of the Siwalik Group of Neogene to Pleistocene crop out along the many steep-sided stream valleys that dissect the land. The northern edge of which extends southwards is predominantly Piedmont bench. Landforms of the area can be further divided into land formed by erosion and landforms constructed by the deposition of sediments. Different soil types and landforms with a range of slopes and active geological processes may limit the suitability of the land for the various purpose.

4.2.3 Land Use

Patterns of land use in Islamabad have evolved through years and have been influenced by environmental and physical factors such as landforms, climate, and water availability as well as human factors such as population size, growth, economic demands and cultural practices or customs.

Natural vegetation includes scrub, forest, and plantation which are about 38.15% in Islamabad in the year 2016. Bare soil covers more than 46%. The built-up area covers 15.14% of the total while water is only 0.44%.

Table: Temporal Variation of Land use

Sr. No	Class	Area in Percentages (%)			
		1990	2000	2010	2016
1	Permanent Vegetation	24.27	34.35	36.199	38.15
2	Urban Area	03.70	3.84	7.125	15.144
3	Bare Soil	71.42	61.34	56.2	46.26
4	Water	0.60	0.46	0.45	0.44

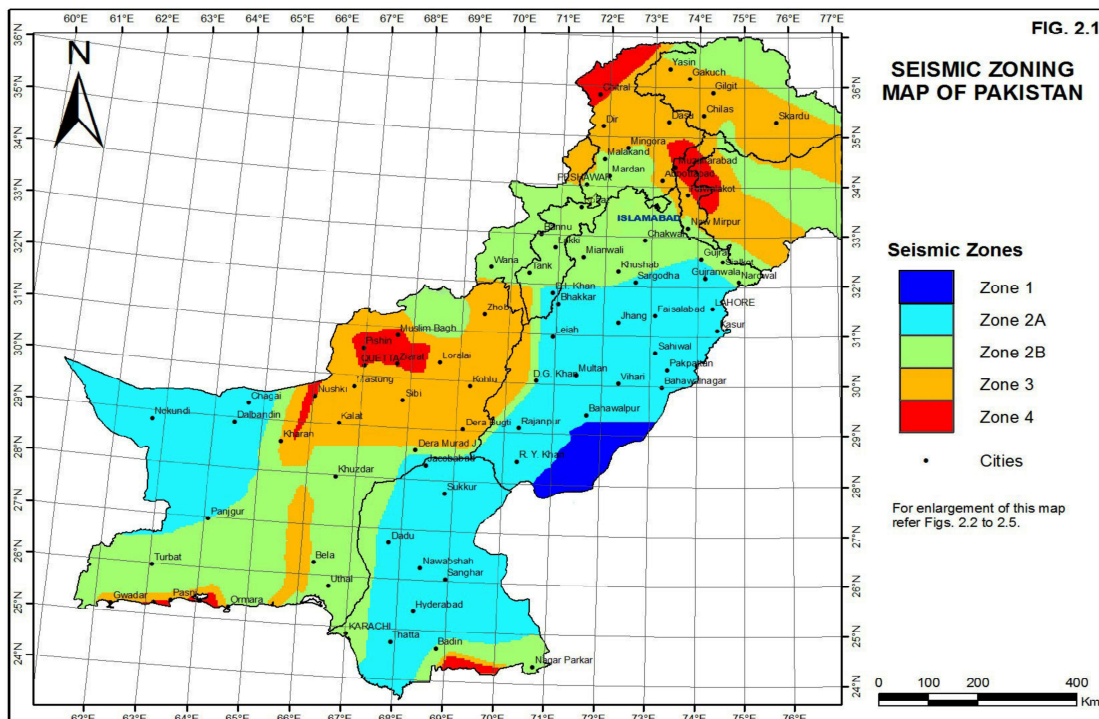
Source: DIGITAL ENVIRONMENTAL ATLAS OF ISLAMABAD: Establishment of Geometric Centre for Climate Change and Sustainable Development Pakistan environmental Protection Agency Ministry of Climate Change

4.2.4 Seismic Risk

Islamabad region can be divided into three major structural zones. The mountainous north including Margalla Hills is complexly folded and thrust along the Hazara Fault Zone. Southwards the mountains are a sloping piedmont bench that is truncated in sandstone and shale. The Soan River flows along the axis of Soan syncline. Islamabad lies just at the edge of Hazara Fault Zone that consists of an arc of thrust and folded rocks about 25km wide and 150 km long that is convex to the south and extends west-southward away from the Himalayan syntaxis. There are many thrust sheets in Islamabad area, some of these thrust faults are in front of Margalla Hills which extends north of Fatehjang and form Kala Chita Range.

4.2.5 Major Earthquakes

The Islamabad region lies in a tectonically active zone, where earthquakes have been frequent in the recent geological history due to faulting and folding of the structure. Geological past shows that there were many activities of earthquakes in the past in the region. The Soan syncline is an asymmetric, faulted fold of regional extent, plunging west southward. Although earthquake shaking is not confined to areas near surface faults, the risk of surface rupture is greater where the surface has been broken previously. Earthquakes in 2005 (7.6 magnitudes) resulted in immense destruction in Islamabad. Repeated earthquakes have been hitting the area almost every year.



4.2.6 Surface Water

Rawal Lake is a man-made water reservoir, located across Korang River at a distance of about 10 km from Rawalpindi. The Soan and Korang Rivers are the main streams draining in Islamabad area. Their primary tributaries are the Ling River, draining north-westward into the Soan; Gumreh Kas, draining westward into the Korang from the

area between the Korang and Soan, and Lei Nullah, draining southward into the Soan from the mountain front and urban areas. The Korang and Soan Rivers are dammed at Rawal and Simly Lakes, respectively, to supply water for the urban area.

4.2.7 Ground Water

Ground water quality of the project site is good and used for drinking and other domestic purposes. The commercial area comprises various buildings have Municipal Water supply from CDA. The groundwater level ranges from approximately 250 – 300 ft. at the project area. Water quality report of the area is attached as **Annex I** of this EIA report.

4.2.8 Traffic and Transportation

All major cities and towns are accessible through regular trains and bus services running mostly from the neighbouring city of Rawalpindi. Lahore, Faisalabad, Multan, Swat and Peshawar are linked to Islamabad through a network of motorways which has resulted in a significant reduction in travelling times between these cities. M-2 Motorway is 367 km long and connects Islamabad and Lahore. M-1 Motorway connects Islamabad with Peshawar and is 155 km long. Islamabad is linked to Rawalpindi through the Faizabad Interchange.

4.2.9 Climate

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

Islamabad has distinct seasons marked by the wide variation in temperature. The climate remains very salubrious from April to October, but the winters get very cold due to snowfall. The coldest months are December, January and February. The

hottest months are June and July. Rainfall in April and May is occasional, but the heaviest rain is in July and August.

The temperature of capital territory Islamabad ranges between -1°C to 46°C . The coldest month is January when the mean maximum temperature is 18.3°C and mean minimum is 3.8°C . From February to May the temperature rises at the rate of 5.0°C per month. The highest temperature reached in May when the mean maximum temperature remains 39°C .

4.2.10 Water Quality

The ground water is available in the area. For establishing baseline conditions, 3 groundwater samples was collected from bore at the site. Sample was analyzed in the laboratory. The laboratory test results are attached as **Annexure-I**.

Electrical Resistivity Report has been conducted regarding ground water which is attached as **Annexure II**.

4.2.11 Ambient Air Quality

The ambient air quality was monitored at three locations. The ambient air quality was monitored for priority pollutants such as CO, NO, NO₂, O₃, SO₂, PM₂₋₅, SPM and PM₁₀. The monitoring period was 24 hours at each sampling point. There results obtained are tabulated under. The detailed environmental monitoring report prepared by ES PAKLaboratory is also attached as **Annexure-III**.

Ambient Air Quality Monitoring

Sr #	Parameter	Limit Values (NEQS-24 Hours)	Concentration	Method / Equipment Used	Remarks
1	CO	5mg/ m ³ (8 hours)	2.8 mg/m ³	Non Dispersive Infrared Absorption (NDIR)	Within Prescribed Limits
2	SO ₂	120 µg/m ³	19.6 µg/m ³	UV Flouresence (UVF)	Within Prescribed Limits
3	O ₃	130 µg/m ³ (1 hour)	28.4 µg/m ³	Non Dispersive UV Absorption	Within Prescribed Limits

4	NO	40 µg/m ³	15.1 µg/m ³	Chemiluminescence Detection	Within Prescribed Limits
5	NO ₂	80 µg/m ³	29.7 µg/m ³	Chemiluminescence Detection	Within Prescribed Limits
6	PM _{2.5}	35 µg/m ³	27.4 µg/m ³	Particulate Sensor	Within Prescribed Limits
7	PM ₁₀	150 µg/m ³	137 µg/m ³	Particulate Sensor	Within Prescribed Limits
8	Suspended Particulate Matter (SPM)	500 µg/m ³	408 µg/m ³	High Volume Sampler (HVS)	Within Prescribed Limits

The above table indicates that the concentrations of CO, NO, NO₂, O₃, SO₂, PM_{2.5}, SPM and PM₁₀ are low at all points and well within limits specified by the Pak EPA.

4.2.12 Noise Level

Noise levels were monitored with the help of a portable digital sound meter at three locations for twenty four (24) hours with an interval of one second. The hourly average data was provided by ES Pak Laboratory. The minimum and maximum noise levels observed at the given locations are tabulated under. The detailed environmental monitoring report prepared by ES Pak Laboratory is also attached as **Annexure-IV**.

Noise Levels Measurement

Sr #	Measurement Point	Limit Values (NEQS)	Noise Level in dB(A) Leq	Remarks
1	Mid of Point 01 (GPS: (33.639096° N, 72.879228° E) Day Time	65 dB (A)	60 dB (A)	Within prescribed limits
2	Mid of Point 01 (GPS: (33.639096° N, 72.879228° E) Night Time	55 dB (A)	53 dB (A)	Within prescribed limits
3	Mid of Point 02 (GPS: (33.635628° N, 72.87871° E) Day Time	65 dB (A)	60 dB (A)	Within prescribed limits
4	Mid of Point 02 (GPS: (33.635628° N, 72.87871° E) Night Time	55 dB (A)	54 dB (A)	Within prescribed limits
5	Mid of Point 03 (GPS: (33.639766° N, 72.879829° E)	65 dB (A)	60 dB (A)	Within prescribed limits

	Day Time			
6	Mid of Point 03 (GPS: (33.639766° N, 72.879829° E) Night Time	55 dB (A)	53 dB (A)	Within prescribed limits

It is evident from the noise monitoring data that noise levels are on the higher side in the day time and lower in the night time.

4.3 Ecological Environment

The flora and fauna of the Himalayas varies with climate, rainfall, attitude, and soils. The climate ranges from tropical at the base of the mountains to permanent ice and snow at the highest elevations. The amount of yearly rainfall increases from west to east along the front of the range. This diversity of climate, attitude, rainfall and soil conditions generates a variety of distinct plant and animal communities.

4.3.1 Flora

The vegetation of project area around Islamabad is a representative of Dry Subtropical Scrub Forest which is dominated by *Acacia modesta* (Phulai), *Ziziphus mauritiana*(Ber); *Ziziphus nummularia* (Mullah), etc. Other associates existing in varying proportions include *Prosopis cineraria* (Jand), *Melia azadirachta* (Dharek); *Morus alba* (Mulberry-Shahtoot); *Dalbergia sissoo* (Tahli-Shisham); *Acacia nilotica*(Kiker). In the undergrowth *Cannabis sativa* (Bhang), *Calotropis procera* (Desi Ak), *Partheniumhysterophorous* (GandiBooti) and *Ocimumbacilicum* (Niazbo) are predominant.

Grasses

Sr. No	Local Name	Scientific Name
1	Dab	<i>Desmostachya bipinnata</i>
2	Maniara	<i>Pennisetum divisum</i>

4.3.2 Fauna

In its original form, the Dry Subtropical Scrub Forest constituting the habitat of wild fauna consists of a host of animals and birds. As the disturbance increased to a maximum level with complete inhabitation, wildlife abundance and diversity decreased to a minimum degree. Species still found include:

Mammals

Sr. No	Local Name	Scientific Name
1	Rat	<i>Rattus rattus</i>
2	Wild boar	<i>Sus sucrofacristatus</i>
3	Porcupine	<i>Hystrixindica</i>

Birds

Sr. No	Local Name	Scientific Name
1	Quail	<i>Coturnix coturnix</i>
2	House Sparrow	<i>Passer domesticus</i>
3	House Crow	<i>Corvus splendons</i>

Reptiles

Sr. No	Local Name	Scientific Name
1	Monitor lizard	<i>Varanus bengalensis</i>
2	Spin tailed lizard	<i>Uromastix hardwickii</i>

SECTION – 5

SOCIAL BASELINE

5.0 General

The Project Area is located at Sector E-17, Islamabad. It is having Cabinet Division Employees Cooperative Housing Society Sector E17&MPCHS Multi Professionals Cooperative Housing Society F 17 on the East, open land / Nala and Gulshan E Sehat E 18 on the West, Cabinet Division Employees Cooperative Housing Society Sector E17 on the North and MPCHS Multi Professionals Cooperative Housing Society F 17 on the South. Society is located at Rawalpindi Fateh Jang / Kohat Road.

5.1 Methodology

Social baseline was developed using both the primary and secondary sources of data. Social Survey was conducted in the nearby localities of Pind Parian, Cabinet Division Employees Cooperative Housing Society Sector E17&MPCHS Multi Professionals Cooperative Housing Society F 17 on the East, Gulshan E Sehat E 18 on the West, Cabinet Division Employees Cooperative Housing Society Sector E17 on the North and MPCHS Multi Professionals Cooperative Housing Society F 17 on the South to get primary information about the socio-economic status of these communities. For the purpose of social survey, structured interview schedule was used keeping in view the nature and level of the respondents, in which both open and close ended questions were used. During the survey 80 people were contacted to study the socioeconomic conditions of the nearby settlements. In addition, informal and formal group discussions were also held within these communities and with various potential NGOs to study their awareness, acceptance, concerns, preferences and perceptions about the development of the society. Tool used for social survey is attached as **Annexure-V**.

Documents related to historical records of population statistics like District Census Report of Islamabad / Rawalpindi (1998) was also used to get overall picture of the district population related to socioeconomic parameters.

5.2 Political and Administrative Setup

The Islamabad Capital Territory (ICT) Administration, generally known as ICT Administration or Islamabad Administration, is the civil administration as well as main law and order agency of the Federal Capital.

The local government authority of the city is the Islamabad Metropolitan Corporation (IMC) with some help from Capital Development Authority (CDA), which oversees the planning, development, construction, and administration of the city. The total area of the District Islamabad is 906.50 square kilometers.

5.3 Demography

5.3.1 Population Size, Growth and Distribution

Regionally the total population of the Islamabad is 11,98,000 as enumerated in 2022 with an intercensal percentage increase of 2.92% since 2021 when it was 11,64,000 souls. The total area of the district is 906.50 square kilometers, which gives population density of 1321 persons per square kilometer.

TABLE - 1: PROVISIONAL PROVINCE WISE POPULATION BY SEX AND RURAL/URBAN

CENSUS - 2017 PAKISTAN								
ADMINISTRATIVE UNITS	HOUSEHOLDS	POPULATION - 2017				POPULATION 1998	SEX RATIO 2017	1998 - 2017 AVERAGE ANNUAL GROWTH RATE
		MALE	FEMALE	TRANSGENDER	ALL SEXES			
1	2	3	4	5	6	7	8	9
PAKISTAN *	32,205,111	106,449,322	101,314,780	10,418	207,774,520	132,352,279	105.07	2.40
RURAL	20,012,797	67,300,171	64,886,593	2,767	132,189,531	86,855,233	103.72	2.23
URBAN	12,192,314	39,149,151	36,428,187	7,651	75,584,989	45,497,046	107.47	2.70
KHYBER PAKHTUNKHWA	3,845,168	15,467,645	15,054,813	913	30,523,371	17,743,645	102.74	2.89
RURAL	3,104,154	12,495,278	12,298,236	223	24,793,737	14,456,435	101.60	2.87
URBAN	741,014	2,972,367	2,756,577	690	5,729,634	3,287,210	107.83	2.96
FATA	558,379	2,556,292	2,445,357	27	5,001,676	3,176,331	104.54	2.41
RURAL	542,255	2,481,840	2,377,911	27	4,859,778	3,090,858	104.37	2.41
URBAN	16,124	74,452	67,446	0	141,898	85,473	110.39	2.70
PUNJAB	17,103,835	55,958,974	54,046,759	6,709	110,012,442	73,621,290	103.54	2.13
RURAL	10,714,102	35,197,990	34,425,030	2,124	69,625,144	49,490,394	102.25	1.81
URBAN	6,389,733	20,760,984	19,621,729	4,585	40,387,298	24,130,896	105.81	2.74
SINDH	8,585,610	24,927,046	22,956,478	2,527	47,886,051	30,439,893	108.58	2.41
RURAL	4,185,828	11,919,109	11,056,183	301	22,975,593	14,744,436	107.80	2.36
URBAN	4,399,782	13,007,937	11,900,295	2,226	24,910,458	15,695,457	109.31	2.46
BALUCHISTAN	1,775,937	6,483,653	5,860,646	109	12,344,408	6,565,885	110.63	3.37
RURAL	1,301,212	4,690,099	4,253,393	40	8,943,532	4,797,055	110.27	3.33
URBAN	474,725	1,793,554	1,607,253	69	3,400,876	1,768,830	111.59	3.49
ISLAMABAD	336,182	1,055,712	950,727	133	2,006,572	805,235	111.04	4.91
RURAL	165,246	515,855	475,840	52	991,747	276,055	108.41	6.95
URBAN	170,936	539,857	474,887	81	1,014,825	529,180	113.68	3.48

* 1. Total Population includes all persons residing in the country including Afghans & other Aliens residing with the local population

2. Population does not include Afghan Refugees living in Refugee villages

3. Total Population excluding Population of AJK & GB

5.3.2 Religion

Islam is the largest religion in the city, with 95.43% of the population following it. Christianity is the second largest religion is with 4.34% of the population following it. The Christians are concentrated mainly in the urban areas. Hinduism is followed by 0.04% of the population according to the 2017 census.

5.3.3 Mother Tongue

According to 2017 census, the mother tongue of the majority of the population is Punjabi at 52% (a decrease of 18% from the 1998 census), and a major dialect is Pothohari, 19% of the population are Pashto speakers, while an additional 12% speak Urdu, the national language, whereas the rest 17% speak other languages. Similarly according to 1998 census, the total migrant population of the city is 1 million, with the majority (691,977) coming from Punjab. Around 210,614 of the migrated population came from Sindh and rest from Khyber Pakhtunkhwa and Azad Kashmir. Smaller populations emigrated from Balochistan, and Gilgit–Baltistan.

5.3.4 Sex Ratio

TABLE - 1 AREA, POPULATION BY SEX, SEX RATIO, POPULATION DENSITY, URBAN PROPORTION, HOUSEHOLD SIZE AND ANNUAL GROWTH RATE

ADMN - UNIT	AREA (SQ. KM.)	POPULATION - 2017								POPULATION 1998	1998-2017 AVERAGE ANNUAL GROWTH RATE
		ALL SEXES	MALE	FEMALE	TRANS GENDER	SEX RATIO	POPULATION DENSITY PER SQ. KM.	URBAN PROPORTION	AVERAGE HOUSEHOLD SIZE		
1	2	3	4	5	6	7	8	9	10	11	12
ISLAMABAD DISTRICT	906	2,003,368	1,052,328	950,760	280	110.68	2211.22	50.37	5.86	805,235	4.90
RURAL		994,365	516,723	477,518	124	108.21			5.94	276,055	6.96
URBAN		1,009,003	535,605	473,242	156	113.18			5.78	529,180	3.45
ISLAMABAD TEHSIL	906	2,003,368	1,052,328	950,760	280	110.68	2211.22	50.37	5.86	805,235	4.90
RURAL		994,365	516,723	477,518	124	108.21			5.94	276,055	6.96
URBAN		1,009,003	535,605	473,242	156	113.18			5.78	529,180	3.45

5.3.5 Age Structure

Gender (C 2017)		Age Groups (C 2017)		Age Distribution (C 2017)	
Males	1,052,328	0-14 years	678,453	0-9 years	471,197
Females	950,760	15-64 years	1,251,528	10-19 years	403,237
Transgender	280	65+ years	73,387	20-29 years	382,600
				30-39 years	295,782
				40-49 years	194,053
				50-59 years	136,346
				60-69 years	76,268
				70+ years	43,885

5.4 Quality of Life

5.4.1 Literacy

A person is treated as literate if he can read newspaper or a journal of same standard and can write a simple letter in any language. Islamabad boasts the highest literacy rate in Pakistan at 98%, and has some of the most advanced educational institutes in the country. A large number of public and private sector educational institutes are present here. The higher education institutes in the capital are either federally chartered or administered by private organizations and almost all of them are recognized by the Higher Education Commission of Pakistan. High schools and colleges are either affiliated with the Federal Board of Intermediate and Secondary Education or with the UK universities education boards, O/A Levels, or IGCSE. According to Academy of Educational Planning and Management's report, in 2009 there were a total of 913 recognized institutions in Islamabad (31 pre-primary, 2 religious, 367 primary, 162 middle, 250 high, 75 higher secondary and intermediate colleges, and 26 degree colleges). There are seven teacher training institutes in Islamabad with a total enrolment of 604,633 students and 499 faculty.

The Gender Parity Index in Islamabad is 0.93 compared to the 0.95 national average. There are 178 boys only institutes, 175 girls only, and 551 mixed institutes in Islamabad. Total enrolment of students in all categories is 267,992; 138,272 for boys and 129,720 for girls. There are 16 recognized universities in Islamabad with a total enrolment of 372,974 students and 30,144 teachers. Most of the top ranked universities; National University of Sciences and Technology, COMSATS Institute of Information Technology and Pakistan Institute of Engineering & Applied Sciences, also have their headquarters in the capital. The world's second largest general university by enrolment, Allama Iqbal Open University is located in Islamabad for distance education. Other universities include Air University, Bahria University, Center for Advanced Studies in Engineering, Federal Urdu University of Arts, Science and Technology, Hamdard University, National University of Computer and Emerging Sciences, Capital University of Science & Technology, National Defence University, Shifa Tameer-e-Millat University, National University of Modern Languages, Iqra University, International Islamic University, Virtual University of Pakistan, Muhammad Ali Jinnah University, The University of Lahore, Abasyn University, and The Millennium University College.

During the survey it was observed that people of the Project Area are very much prone towards higher education of their children. **Table** shows the survey results analyzed for education level of the respondents. Out of the total survey respondents, only 04% were educated above intermediate level including college and university education. 20% were intermediate level, 19% were upto matric level but highest category was of illiterate people, which were 27.5%.

Table: 5.6 Education Levels of the Respondents

Sr #	Educational Level	Number	Percentage
1	Illiterate	22	27.5
2	Primary	10	12.5
3	Middle	14	17
4	Matric	15	19
5	Intermediate	16	20
6	Above Intermediate	3	04
Total		80	100

5.4.2 Professional Status

The Project Area is mostly plain with housing societies at its surrounding only scanty agriculture is present. The people in the surrounding societies normally resort to jobs at private and government sector, at pind parian people are mostly doing job and also attached to labour jobs outside the Project Area. A minor segment of the population of the Project Area has got jobs overseas.

During the social survey at surrounding areas, respondents were also asked about their occupational associations, and after analysis it was found that 20% of the total respondents were associated with labor, 5% with agriculture, 25% were shopkeepers and only 7% were teachers. **Table** shows the findings of the survey results.

Table : Professional status of the Respondents

Sr #	Professional Status	No. of Respondents	Percentage
1	Agriculture	16	5
2	Government Job	08	45
3	Shopkeeper's	20	20
4	Labor	30	20
5	Teachers	06	10
Total		80	100

5.4.3 Average Monthly Incomes

From the occupational affiliations of the respondents, it can be easily judged that affected communities belong to the income group of people whose income levels are medium. **Table** below depicts the analysis results of the surveyed data. It can be observed that majority (40%) of the respondents belong to income group of 30,000 – 50,000 and only 04% respondents were earning their incomes above 75,000. **Figure below** shows the activities related to social survey of the Project Area.



Social Survey in Process in the Project Area

Table 5.8: Income Level of the Respondents

Sr#	Income Level (Rs.)	No. of Respondents	Percentage
1	Less than 10,000	10	12
2	10,000 – 30, 000	27	34
3	30, 000 – 50, 000	32	40
4	50, 000 – 75, 000	08	10
5	75, 000 & above	03	04
Total		80	100

5.4.4 Economically Active Population

The economically active population is defined as the persons working, most of the time during the year preceding the cause date, looking for work, laid off and un-paid family helpers assisting their family.

5.4.5 Unemployment Rate

Unemployment rate is measured as ratio of looking for work and laid off in total economically active population comprising employed, looking for work, laid off and un-paid family workers, generally representing in percentage.

5.5 Housing Patterns

5.5.1 Construction Type of the Houses

Project Area being plain area with developed housing societies in its surrounding having modern houses in them, community living in Pind Parian have houses with pacca material. During the survey, it was found that 75% houses of the respondents were built of pacca material and 25% were residing in semi-pacca houses built up with locally available construction material. **Table below** shows the survey results.

Table: Construction Type of the Houses

Sr #	Type of Construction	No. of Respondents	Percentage
1	Pacca	60	75
2	Semi-pacca	20	25
3	Kacha	-	-
Total		80	100

5.5.2 Ownership Status of the Houses

Project Area being located inside the jurisdiction of the Islamabad City, so there are mostly developed houses in its periphery. In rural areas, the trend of giving the houses at rent is rarely found in the whole province. When respondents were asked about their ownership status of the houses, it was found after analysis that 100% respondents were residing in the self owned houses. Survey results are apparent from the **Table** given below.

Table 5.10: Ownership Status

Sr #	Status of House	No. of Respondents	Percentage
1	Self Owned	80	100
2	Rented	-	-
3	Free on Landlord Property	-	-
4	Relative House	-	-
Total		80	100

5.5.3 Time Period of Residence

Housing schemes at the project site surrounding are developed since last 20 years onward and residents are living there since 10 years. People are living at Pind Parian since long. During survey at pind parian, when people were discussed about their residence period in that area. It was found that they are living in that area since 30-40 years and have established their economic resources.

5.6 Public Facilities

5.6.1 Electricity

Predominant housing units (91.0%) are using electricity as source of light in the whole district both in rural and urban areas. In the villages, under study for this project electricity is available in the 100% houses.

5.6.2 Cooking Fuel

Sui Gas is available in the village and people are also using wood as cooking fuel. If we have a look on the whole district, more than half (52.9%) of the housing units are using gas as cooking fuel in their houses and remaining population is using wood, kerosene oil and other sources of fuel.

5.6.3 Medical Facilities

Project Site is located in Islamabad District and also at the bank of Rawalpindi District. There are advanced medical facilities present at the both districts.

Islamabad has the lowest rate of infant mortality in the country at 38 deaths per thousand compared to the national average of 78 deaths per thousand. Islamabad has both public and private medical centres. The largest hospital in Islamabad is Pakistan Institute of Medical Sciences (PIMS) hospital. It was established in 1985 as a teaching and doctor training institute. PIMS functions as a National Reference Center and provides specialised diagnostic and curative services. The hospital has 30 major medical departments. PIMS is divided into five administrative branches. Islamabad Hospital is the major component with a 592-bed facility and 22 medical and surgical specialties.

The Children's Hospital is a 230-bed hospital completed in 1985. It contains six major facilities: Surgical and Allied Specialties, Medical and Allied Specialties, Diagnostic Facilities, Operation Theatre, Critical Care (NICU, PICU, Isolation & Accident Emergency), and a Blood Bank. The Maternal and Child Health Care Center is a training institute with an attached hospital of 125 beds offering different clinical and operational services. PIMS consists of five academic institutes: Quaid-e-Azam Postgraduate Medical College, College of Nursing, College of Medical Technology, School of Nursing, and Mother and Child Health Center.

PAEC General Hospital and teaching institute, established in 2006, is affiliated with the Pakistan Atomic Energy Commission. The hospital consists of a 100-bed facility and 10 major departments: Obstetrics and Gynaecology, Paediatric, General Medicine, General Surgery, Intensive Care Unit/Coronary Care Unit, Orthopaedics, Ophthalmology, Pathology, Radiology,

and Dental Department. Shifa International Hospital is a teaching hospital in Islamabad that was founded in 1987 and became a public company in 1989. The hospital has 70 qualified consultants in almost all specialties, 150 IPD beds and OPD facilities in 35 different specialisations. According to the Federal Bureau of Statistics of the Government of Pakistan, in 2008 there were 12 hospitals, 76 dispensaries, and five maternity and child welfare centres in the city with a total of 5,158 beds.

5.6.4 Water Supply

Scarcity of water especially the potable water has remained a major predicament towards opening new sectors in Islamabad. Yet, undeterred by the water shortage, the population of the city is growing at a rate of 5.7 percent per year aggravating the water shortage.

Present population of 1.757 million is likely to increase to 4.443 million in 2050. In Islamabad, the main source of water are, the reservoirs built at Simly and Khanpur and few tube wells, as water aquifer in the capital territory is shallow and scattered.

A peak cumulative water production from these sources is 84 million gallons per day (MGD), which drops down to 62 MGD. The average demand is 176 MGD, while water shortage of 106 MGD, confronts most of the time of the year. The position in neighboring Rawalpindi city and cantonment is equally bad as it is solely dependent on Rawal Lake and sharing with CDA supplies from Khanpur Dam.

5.6.5 Commercial Banks

The nearest bank facility is available at Rawalpindi Fateh Jang / Kohat Road. People have to come there for their financial handlings of routine activities.

5.6.6 Communications

The Project Area is connected with Cabinet Division Employees Cooperative Housing Society at one side and connected with Pind Parian Road at its rear. The system of communication in Islamabad and Rawalpindi is very satisfactory. The Capital Development Authority's Engineering Wing under the Ministry of Transportation maintains over 2,000 kilometers (1,200 mi) of roadways organized into various classifications which crisscross the territory (mainly Islamabad).

The main line of the Pakistan Railways and the Grand Trunk Road parallel to the railways runs through the District Rawalpindi to various other cities like Peshawar, Kohat, Mianwali, Faisalabad, Lahore and Karachi.

5.7 Communities Acceptability about the Project

5.7.1 Awareness about the Project

Almost 100% respondents were aware of the construction of the proposed Project and none of the respondents was found who was unaware about the project. **Table** shows the awareness level of the respondents.

Table: Awareness about the Project

Sr#	Response	Number	Percentage
1	Those who know	80	100
2	Those who don't know	-	-
Total		80	100

5.7.2 Accessibility of the Project

After the sample survey it was observed that 81% respondents favored the construction of the Project while remaining 19% did not favor the Project implementation

Table: Acceptability of the Project

Sr#	Response	Number	Percentage
1	In Favor	65	81
2	Not in Favor	15	19
Total		80	100

5.7.3 Perceptions about the Project

Perceived Impacts during Construction Stage

Based on the sample survey and informal meetings conducted with the people of the Project Area, the various perceived impacts of the respondents during construction stage of the project are tabulated in **Table below** (multiple response), 20% of the respondents think that with the construction of the proposed project will cause duct

emissions, In nineteen percent (19%) cases, people expressed that construction activity at site will result in creating job opportunities for the local people. Eighteen percent (18%) perceive that it will produce noise and vibrations due to movement of heavy machinery which will result in disturbing the routine activities of the people of surrounding areas. In sixteen percent (16%) cases the respondents showed their serious concern that during construction, movement of the females going outside for daily routine chores activities will be disturbed. In 9% cases, respondents did not give any response regarding impacts of this proposed Project during construction.

Table: Impacts during Construction Stage

Sr #	Perceived Impacts	Frequency	Percentage (%)
1	Dust Emissions	45	20
2	Employment Opportunities	41	19
3	Noise and Vibration Problem	40	18
4	Movement Problem for the females in Their daily Routine Activities	35	16
5	Increased Commercial Activity	25	11
6	Debris Fall	15	07
7	No Response	20	09
Total		221*	100

*Multiple Responses

Perceived Impacts during Operation Stage

At the operational stage, **(Table multiple response)**, twenty two percent (22%) of the responses thought that construction of the proposed project would result in creating job opportunities for the local people. In nineteen percent (19%) cases respondents considered the increased commercial activity at the project site. During the operation stage, the females will have to face movement problems to do their routine chores. In 13% & 05% cases responses were that implementation of the Project will create movement problem for the people and traffic jams due to increased number of vehicles. In twenty six percent (26%) cases, the respondents did not give any response.

Table: Impacts during Operation Stage

Sr #	Impacts During Operational Stage	No. of Respondents	Percentage (%)
1	Employment Opportunities for the Local People	25	22
2	Increased Commercial Activity	21	19
3	Movement Problem for the Females	17	15
4	Livestock Movement Problems	14	13
5	Traffic Jams at the Entrance	05	05
6	No Response	31	26

Total	113*	100
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*Multi Responses

Protective Measures Suggested by the Respondents

Table below(multi response), shows the protective measures suggested by the respondents during the field survey. It is evident from the Table that out of total 160 responses, 28% responses highlighted the need to provide local people jobs on priority basis. 20% responses emphasized that dust and noise should be controlled by adopting the latest techniques. 09% considered that it is necessary to chalk out proper

management plan for traffic so that movement of the locals is disturbed at the minimum. Controlled excavation and construction at day time only was in 6% and 8% cases respectively, while 29% provided no response/suggestion.

Table: Protective Measures Suggested by the Respondents

Sr #	Measures Suggested	Frequency	Percentage (%)
1	Priority in Jobs for Local People	45	28
2	Dust and Noise Control	32	20
3	Controlled Movement of Traffic	15	09
4	Controlled Blasting	10	06
5	Construction at Day Time Only	12	08
6	No Response	46	29
Total		160	

*Multiple Responses

5.8 Physical and Cultural Heritage

Shrine

No any shrine is present at the Project site.

Mosques

There are also small mosques in nearby localities of the Project Area. Those mosques have been constructed by the local residents with the mutual contributions of the concerned communities. **Figure 5.5** shows the view of nearby mosque



Figure: View of mosque near the Project Area

Graveyards

There are many small level graveyards at nearby areas. The presence of shrines, mosques and graveyards has a very sensitive religious and cultural significance in our society.

5.9 Recreational Sites

Murree

It is the most accessible hill station in North Pakistan and is connected with very fine metalled roads from Rawalpindi and Islamabad. Besides the old Rawalpindi-Murree Highway, a new Highway through Project Area "Angoori" is being developed up to Murree. Magnificent views of the snow clad mountains of Kashmir can be seen during spring and autumn in Murree and its surroundings and gorgeous sunset and cloud effects are seen daily during the rainy season. The Places of interest include Bhurban, Kashmir Point, Pindi Point and Patriata Chairlift/Cable Cars.

Rawalpindi

The famous recreational sites in the Rawalpindi city are Ayub National Park and Liaquat Memorial Park (Company Bagh).

Islamabad

The key places of interest in Islamabad are the Margalla Hills, Shakarparian, Rawal Lake, Islamabad Park, Rose and Jasmine Garden, Murghazar Mini Zoo, Children's Park and Fatima Jinnah Park, etc.

5.10 Corporate Citizenship Values

Faisal Residencia firmly believes that their first responsibility is towards their team, clients and residents. This is the core of their citizenship values. This essentially means taking care of the immediate environment under and around their communities. Faisal Residencia Management is committed to enhance and restore communities and people in need.

Communities***Helping Those in Need***

- Different Trust, managed entirely by the society management has so far spent handsome amount on welfare activities in different fields;
- Also coordinating with a number of organizations and institutes nationwide;
- Management has been in the forefront during the recent devastating flood that our nation faces. Their support and relief teams were among the first few to reach out to the victims.

Healthy People Healthy Community

Regular medical camps are held by the management at different hospitals in Islamabad and Rawalpindi. These camps provide free or highly subsidized treatment as follows;

- Immunization of the children of the community for all infectious diseases;
- Sale of medicine at highly subsidized rates to the low-income stratum;
- Preventive literature distribution amongst residents for community awareness; and
- Round the clock medical emergency and ambulance service.

Education for Communal Balance & Harmony

- Schools operational in the vicinity of projects;
- College & University under consideration for higher education accessibility;
- Provision of co-curricular and extra-curricular facilities like sports grounds and game courts.

Graceful Lifestyle for All

- Civic amenities for the entire community including a convenient transport system, commercial facilities, recreational options;
- Uniform law and order through security patrols and a check on visitors; and
- Clean and maintained infrastructure with dependable utility supplies like electricity, gas, telephone and cable.

SECTION 6 PUBLIC CONSULTATION

6.0 General

Consultation with the 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 stakeholders.

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 perceptions about the construction of the Project an impact assessment survey was conducted. Stakeholders were consulted with the help of structured/semi-structured tools. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed on the following pages.

6.1 Objectives of the Public Consultation

Public consultation plays a vital role in studying the effects of the Project on the stakeholders and in the successful implementation and execution of the proposed projects. Public involvement is a compulsory feature of environmental assessment which leads to better and more acceptable decision-making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to a rise and to identify those which are not known or are unique to the construction of the proposed Project.

The important general objectives of the Consultation process are:

- Information dissemination, education and liaison;
- Identification of problems and needs;
- Collaborative problem solving;
- Reaction, comment and feedback on proposed Project; and
- Documenting mitigation measures proposed by the stakeholders.

6.2 Methodology

The consultants carried out public consultations at various locations around the proposed Project Site. The Stakeholders consultation during this phase of the work

targeted the Housing Societies at surrounding and Pind Parian, various NGOs and administrative and educational institutions in the Project Area. Following strategy was adopted for public consultation:

- Selection of the stakeholders for consultation, reconnaissance of the proposed Project Site and initial discussions with the residents, office workers, pedestrians and shopkeepers etc.
- Appraising the targeted stakeholders initially for the purpose of consultation and working out a schedule for holding regular consultation meetings;
- Meetings with the stakeholders through the participation of consultants, environmental and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc; and
- All the meetings were held in open atmosphere in which participants expressed their views freely.

6.3 Major Stakeholders identified

In the Project Area, all the possible stakeholders were identified during the survey. Following is the list of potential stakeholders in the Project Area.

- Local residents
- Teachers
- Shop owners
- Office Workers
- Laborers
- Pedestrians
- Mosque users
- Transport users
- Non-government organizations (NGOs)

6.4 Categories of Stakeholders Consulted

The stakeholders contacted during the survey belonged to different categories of people and institutions as below:

- Local residents
- Office Workers

- Shop Owners
- School Teachers
- Councilors
- NGOs

Schedule of consultations is given below in **Table**

Table 6.1: Schedule of Consultations

Sr #	Date	Venue	Contact Person
1	05-12-22	Pind Parian	Abdul Samad Khan Niazi
2	05-12-22	Pind Parian	Muzamil Khan
3	05-12-22	Pind Parian	Zeshan Ahmed
4	05-12-22	Cabinat Division Housing Society	Umer Farooq
5	05-12-22	Cabinat Division Housing Society	Shehbaz Malik
6	05-12-22	Cabinat Division Housing Society	Iftikhar Ahmed
7	05-12-22	Pind Parian	Faisal Nadeem
8	05-12-22	Pind Parian	Kamran Bhatti
9	05-12-22	Rawalpindi	Official of NCPC Foundation

6.5 Issues Discussed

Following issues were discussed during the stakeholder's consultation:

- Overall activities of the project and their possible impacts;
- Possible impacts on natural vegetation, flora and fauna;
- Possible mitigation measures;
- Beneficial factors and involvement opportunities of the local people in the set of activities of Project; and
- Management of traffic during construction and operational phase of the project.

Figure 6.1 shows a view of public consultation in the Project Area.



Figure 6.1: A view of public consultation in the Project Area

6.6 Findings of the overall Discussions

- The proposed project will result in change of the land use of the area;
- Construction of the project should be completed in the designated time frame;
- Project will cause intrusion upon the privacy of residents of the area because of construction of high rise project;
- There will be additional load on the water extraction, creating the problem of water shortage with the passage of time;
- There must be proper system for solid waste management and its final disposal;
- There must be proper disposal for the waste water generated;
- There will be increase in dust, noise and smoke emissions during construction;
- Proper parking area should be provided in the project design;
- The proposed project will help in the promotion of tourism;
- It will enhance the project accommodation facilities for visitors/tourists;
- There will be 24 hours hustle and bustle in the residential area due to the incoming and outgoing guests from the project building;
- Project will increase revenue generation for the Government;

- It will create employment opportunities for the local people;
- Local people should be given preference for employment in the proposed project;
- There will be disturbance in the ecological and biodiversity patterns of the project area;
- Proper management of traffic during construction and operation stages must be done to avoid disturbance to people;

Meetings were also held with officials of NCPC to discuss perceived impacts of such developmental activities taking place in the vicinity of Islamabad city. The recorded concerns as follows:

- The officials inquired about the facilities being planned for the treatment of waste water and handling of solid waste to be generated from the project;
- The Project as envisaged would cause the demolition of the natural vegetation and would result in adverse environmental impacts;
- The proposed project will impact negatively on ground water resources of the area;
- Biodiversity of the Project Area during the construction and operational phase will be affected greatly;
- Community development programs would be helpful to gratify some of the issues of the community;
- The proposed project will impact negatively to generate the solid waste during construction and operation;
- Proper management plans would help to reduce the environmental impacts of the proposed project;
- Improvement of the landscape of the project area to conserve the biodiversity of the area is necessary;
- Emphasis would be on plantation of indigenous plants.

On the positive side, in these meetings, the participants also considered that the construction of the proposed project will overcome the shortage of basic necessities, accommodation facilities, generate employment opportunities and revenue for the Government.

6.7 Address of Concerns

Efforts have been made in the preparation of this Environmental Impact Assessment Report to address all the concerns raised by the stakeholders during the consultation meetings. Proper management plans have been proposed in the relevant sections to deals with all the issues related to biodiversity conservation, management and disposal of solid waste, waste water disposal and safeguarding interests of the local people.

SECTION – 7 ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

7.0 General

This section presents likely positive and negative environmental impacts together with the proposed mitigation measures to prevent and/or alleviate them to the extent possible during the design, construction and operational phases of the proposed project.

7.1 Environmental Screening of the Proposed Project

For the proposed project, an Environmental Screening matrix was developed as part of the present EIA study focusing on the potential Environmental impacts of the project during construction and operation phases. The matrix examines the interaction of project activities with various components of the Environment. The impacts are broadly classified as physical, biological and social, and then each of these broad categories further divided into different aspects. The potential impacts thus predicted are characterized as follows:

High Negative (adverse) Impact,
Low Negative Impact,
Insignificant Impact,
High Positive (beneficial) Impact,
Low Positive Impact, and
No Impact.

The negative impacts predicted in this manner are the "unmitigated" impacts. Appropriate mitigation measures have been recommended as part of this EIA. The occurrence and severity of the potentially adverse impacts will be reduced as a

consequence of the incorporation of these mitigation measures into the project design/management.

The negative impacts screened through this process are discussed in the following sections:

7.2 Environmental Impact Characterization

During the Environmental Impact Assessment process, the predicted impacts were characterized. Various aspects of the impact characterization include:

- Nature (direct/indirect)
- Duration of Impact (short term, medium term, long term)
- Geographical Extent (local/regional)
- Timing (project phase)
- Reversibility of Impact (reversible/irreversible)
- Likelihood of the impact (certain/likely/unlikely/rare)
- Impact consequence severity (severe/moderate and mild)
- Significance of Impact (High/Medium/Low)

Subsequent to the characterization, appropriate mitigation measures were identified in order to minimize if not completely eliminate the adverse impact associated with project activities, finally, residual impacts were identified.

The impact characterization of the predicted impacts, mitigation measures and residual impacts are discussed below.

7.3 Project Siting

The impacts associated with the project siting are those, which relate to the placement of the FAISAL RESIDENCIA at the proposed location. These impacts are different from those, which are associated with the project's construction, and operation activities (discussed later in the section), in the sense that the construction and operation impacts are associated with the activities such as land clearing, waste disposal, whereas the siting impacts relate to the mere presence of a facility at the given location.

For the proposed project, the following two aspects of the project siting were considered:

- Visual Impacts
- Cumulative Impacts

These are discussed below.

7.3.1 Visual Impacts

The proposed housing estate will be constructed in an area, which has been able to maintain natural topography and greenery despite human habitation. The natural landscape has an aesthetic value, which is perhaps difficult to quantify, but is an important asset of the area. After the establishment of the estate, the built up area including roads, houses and other buildings will replace this natural landscape.

Mitigation Measures

The visual impacts can be minimized at different levels. First of all, the master plan of the estate should look to minimize the changes in the topography, landscape and damage to the natural vegetation. Secondly, the design of the subject project should be such that it blends well with the natural environment. The project is already surrounded by different Housing Societies and the nature of area is mostly plain. Lastly, the landscaping and re-vegetationshould be planned in a manner that the visual impact of the estate is minimized.

Residual Impacts

Despite of the mitigation measures proposed above, the visual impact of the proposed project cannot be completely eliminated.

7.3.2 Cumulative Impacts

There are several housing projects being planned or under implementation in the surroundings of the proposed site. The cumulative impacts of these projects could be significant, in terms of the aesthetic value of the entire area, soil erosion, Damage to the natural vegetation, waste disposal, water contamination and ground water depletion.

Mitigation Measures

Although the impacts of the proposed project have been addressed in this EIA on individual basis, the mitigation measures proposed do not address cumulative impacts. This issue should be addressed at the policy level, and the district, provincial and federal governments should issue policy in this respect.

7.4 Potential Impacts and Mitigation Measures during the Design Phase

7.4.1 Land Use

There will be very less impact on the land use because the proposed project site is plain with negligible amount of vegetation grown on it. Construction of the proposed project will not affect the land use rather it will enhance the land value in the nearby localities/settlements.

Mitigation:

The design of the proposed project will be prepared in a way that minimum land use is changed and maximum area will be allocated for the landscape. In addition, during the design stage the site activities will be controlled to avoid the change in land use.

7.4.2 Land Acquisition

The proposed land for construction of FAISAL RESIDENCIA is already owned by **M/s ZEDEM International (Pvt) Ltd.** is located at Sector E-17, Islamabad. The land owned is 1220.60 Kanals. Therefore, there is no negative impact related to land acquisition.

7.4.3 Sewerage Waste Water/Storm Water Discharge

Proper sewerage system and Storm Water Drainage System will be planned and laid keeping in view the requirements and specifications provided by the relevant authority.

7.4.4 Traffic

During the operation stage traffic in and around the Project Area will increase and may cause traffic congestion. This will be a moderate negative impact.

Mitigation:

Proper Traffic Management Plan will be prepared and implemented to tackle this issue.

7.4.5 Ground Water Consumption

Water will be required during construction & operation of the project activities. The society will drill tube wells for this purpose. Prolonged and high water consumption may lower the underground water table in the long run and affect water supply system of surrounding areas due to excessive withdrawal of water. This will be a moderate negative impact.

Mitigation:

The Proponents management will ensure effective water management, efficient use

of resources and incorporation of design and infrastructure measures for water conservation. The water from Sewerage Treatment Plant will be reused and water conservation strategies will always be adopted.

7.4.6 Emergency Response

Disasters such as earthquakes, flooding (flash floods) and other manmade disasters such as fires may occur, which have to be considered for minimizing their impacts. This will be a moderate negative impact.

Mitigation:

The Building Regulations of Capital Development Authority (CDA) will be implemented in the society. Fire fighting vehicles will be available for the people living in the society. Emergency departments like Rescue 1122, Civil Defence and Fire Fighting Department will also be at service.

7.5 Construction Phase Impacts

Construction phase will be by far the most significant part of the proposed project with respect to Environmental considerations, since most of the impacts are likely to take place during this period. Various obstruction activities will invariably create Environmental disturbances, which may have impacts on the nearby communities. Such impacts include the following:

- Loss/Damage to Cultivation
- Loss/Damage to Natural Vegetation
- Soil Erosion, Degradation
- Air Quality Deterioration
- Surface Water Contamination

- Ground Water Contamination
- Impacts on Down Stream Water Resources
- Loss/Damage to Wild Life
- Blocked Access
- Noise and Vibration
- Safety Hazards
- Public Health and Nuisance Issues
- Damage to Infrastructure
- Gender Issues

These impacts can be readily preempted and mitigated. The mitigation measures recommended in this section will need to incorporate in the Environmental Management Plan for implementation through Environmental requirements and specifications for the detailed design and construction.

These impacts are discussed below.

7.5.1 Issues Related to Land Acquisition and Resettlement

A total of 1220.60 Kanals of land is acquired for the proposed FAISAL RESIDENCIA. All of the land is vacant; and there exist no houses at the land.

Mitigation Measures

- Identification of owners of each land parcel,
- Reaching an agreement for the compensation with the land owners and making the payment,
- Consultation and negotiation with the owners regarding the compensation,
- Keeping complete documentary record of the entire process,
- The concerned departments, such as the Revenue and Forest Departments may also need to be contacted in order to determine a fair compensation for this temporary land take.
- All efforts should be made to keep the existing trees of the forest in the original shape in the project area.

In addition to the above, project employment and business opportunities should also be offered to the affected.

Residual Impacts

All the payments are already done to the land of Faisal Residencia. Hence, the significance of the residual impact is low.

7.5.2 Loss of Cultivation

The area does not support any significance number of trees and is mostly uncultivable; the predominant vegetation is Sanatha shrub.

Mitigation Measures

The movement of vehicles and construction machinery in the agricultural fields will not be allowed. If unavoidable, the loss caused by such project activities will be adequately compensated.

7.5.3 Soil Erosion and Degradation

The soil-related issues include soil erosion, slope stability and soil contamination. The leveling and grading, excavation and filling activities, construction activities and maintenance of equipment vehicles may cause these. The quantities of excavation and fill material will be calculated and the construction of project will be planned in such a way that most of the excavated material is utilized in construction of the roads and filling of low lying areas in track area.

Soil may be contaminated as a result of fuel/oils/chemicals spillage and leakage, and inappropriate waste (soils as well liquid) disposal.

Mitigation Measures

The following mitigation measures will minimize the soil erosion and contamination:

- Leveling and grading will be carried out in a manner to minimize soil erosion,
- Excavated slopes will not be left untreated/unattended for long durations. Appropriate slope stabilization measures will be taken as per the design (e.g. stone pitching). Temporary measures may also be needed to avoid soil erosion.
- Management practices will be employed to minimize leakage and spillage of oils, chemicals and fuels to the ground. These include building containment dikes around fuel/oils/chemical storage, storing these in covered areas, constructing a concrete pad for machinery/vehicle maintenance area. Inspecting machinery and

vehicles for any leakage, and removing contaminated soils for appropriate disposal.

- Vehicles and equipment will not be repaired in the field. If unavoidable, impervious sheathing will be used to avoid soil and water contamination.
- Waste oils will be collected in drums and sold to the recycling contractors. Oily water will be collected and evaporated in small (lined) evaporation ponds.
- The inert recyclable waste from the site (such as card board, drums, broken/used parts, etc.) should be sold to recycling contractors. The hazardous waste should be kept separate and handled according to the nature of the waste.
- Domestic solid waste will not be disposed in a manner that does not cause oil contamination (one of the option is to disposed the recyclable material and landfill the remaining waste at a suitable location).

Residual Impacts

Appropriate construction practices and management actions as listed above will greatly minimize the soil erosion and contamination. The significance of the residual impacts is therefore expected to be low.

7.5.4 Loss of Vegetation

The site preparation and construction activities will necessitate removal of the natural vegetation from the areas where roads, buildings and houses will be constructed. The area does not support any significance number of trees; the predominant vegetation is Sanatha shrub.

Construction crew can also indulge in tree/shrub cutting to obtain fuel food.

Mitigation Measures

The following mitigation measures will further minimize any negative impacts on the flora resource of the area;

- Cutting of trees and other natural vegetation will not be committed as far as possible through astute planning.
- If cutting of trees is unavoidable, tree plantation of local species will be undertaken at appropriate location. The number of trees thus planted will be at least five times the ones that are cut. The trees to be planted should be an appropriate mix of fast and slow growing trees.
- In the entire project area, a comprehensive plantation plan should be developed, with due consideration given to landscaping. The plantation plan should be implemented as early as practicable.
- Endemic (native to the area) trees, particularly wild figs, Pipal, Pilkani, Ber, Amaltas and Jaman should be planted on sides of the road and other areas

wherever water is available. These will attract birds like Green Pigeon, Barbet, Cuckoos and other beautiful birds of subtropical deciduous forest ecozone.

- Slopes must be contoured and grass planted to avoid erosion.
- Eucalyptus must not be planted for the mere reason that its fallen leaves does not degrade for several years and the local soil biodiversity is harmed where these grow.
- Popular trees should not be planted as these suck soil moisture faster.
- Natural! Water, including subsoil water must not be polluted.
- Solid Waste must not dumped anywhere around.
- The construction crew will be provided with LPG as cooking (and heating, if required) fuel. Use of fuel wood will not be allowed.

Residual Impact

The proposed tree plantation will take some time to grow and mature, there will therefore be some reduction of trees and natural vegetation in the area. The residual impact would be "low".

7.5.5 Air Quality Deterioration

Construction machinery and project vehicles will release exhaust emissions, containing carbon monoxide (CO), sulfur dioxide (SO₂), oxides of nitrogen (NO_x), and particulate matter (PM). These emissions can deteriorate the ambient air quality in the immediate vicinity of the project site. Furthermore, construction activities such as excavation, leveling tilting and vehicular movement on unpaved tracks may also cause fugitive dust emissions. The construction works should be carried out a distance of about 100 feet (30 m) from the nearest settlements/houses.

Mitigation Measures

The following mitigation measures will minimize the emissions and their impacts:

- Construction machinery and vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions.
- Fugitive dust emissions will be minimized by spraying water on soil, where required and appropriate.

Residual Impacts

The above measures will reduce the magnitude of the adverse impact; however, these cannot be completely eliminated. There will therefore be some residual

adverse impact of the project activities on the ambient air quality of the project area. The significance of the residual impacts on the air quality is expected to be medium.

7.5.6 Surface Water and Groundwater Contamination

The project activities that can contaminate the surface water and groundwater these include:

- Solid Waste disposal,
- Waste effluents disposal,
- Equipment/Vehicle maintenance
- Spillage/leakage of fuels, oils and chemicals.

Mitigation Measures

The mitigation measures recommended to forestall soil contamination will also prevent water surface and groundwater contamination.

Residual Measures

If the recommended mitigation measures are effectively employed, the residual impacts of the project activities on the water resource of the area will be negligible.

7.5.7 Impacts on Downstream Water Resources

The nearest water body from the site is As stated above, the proposed site is a part of the catchment area of the Soan River, which is an important water body in the area. However, the proposed site is at fair distance from the Soan River (about 23 km) and any containment from the site is unlikely to reach this water course. Also, the proposed site is only a very small portion of the entire catchment area. Groundwater extraction for the project will not cause water depletion downstream of the site.

Mitigation Measures

- The mitigation measures to forestall any surface or groundwater contamination have been discussed earlier.
- The project design should minimize the paved and built up areas, and maximize the tree/shrub plantation, in order to minimize the accelerated rainwater runoff from the area.

Residual Measures

Despite the above measures, there will be some residual impacts on the downstream water resources. The significance of this impact is expected to be low.

7.5.8 Damage to Wildlife

There are no significant wildlife species found in the area because of the modification of the natural habitat. The only species now found in the area are those that have adjusted to the environment disturbed by human presence. These species, such as birds, will not be affected by the construction activities. Excavation may cause some impact on small mammals, but they are likely to leave the area and move to a safer place.

Mitigation Measures

- The measures to prevent soil and water contamination will forestall any adverse impact on faunal resources of the area,
- The measures to restore natural vegetation loss in the area will benefit the area's fauna as well,
- The project staff will not be allowed to indulge in any hunting or trapping activities.

Residual Impact

The residual impacts on the faunal resources are expected to be quite negligible.

7.5.9 Blocked Access

Since the project is located in an area, which is populated, various components of the project can potentially disrupt local communities' access routes. The construction activities may temporarily make the road and tracks unusable for the local population.

Mitigation Measures

- The existing routes will not be blocked as far as possible.
- If blocking of the routes is unavoidable, alternate routes should be made available in consultation with the affected communities.
- Location of the construction camp can be altered to mitigate this impact.

Residual Impact

The re-routing of the local tracks may affect the nearby settlement. However, significance of this residual impact is low.

7.5.10 Noise and Vibration

Noise and Vibration will be generated by the construction machinery and vehicles during the excavation and construction activities. The residential area close to the site will be impacted most by the construction, noise and vibration.

Mitigation Measures

- Construction equipment and vehicles will have exhaust mufflers (silencers) to minimize noise generation.
- Noise will be measured at the nearby houses. If found more than 65 dB, appropriate sound reduction mechanism (such as a noise barrier) will be put in place.
- Vehicular traffic through the communities will be avoided as far as possible.

Residual Impact

With the implementation of above mitigation measures, the residual noise impact will be low to medium.

7.5.11 Safety Hazards, public Health and Nuisance

The project being located close to the communities may pose some safety hazards to the local population. Various project components/activities pose a varying degree of safety hazard to the local population. The construction machinery poses a hazard to the local population, particularly children; and increased vehicular traffic may pose safety hazards along the roads.

The public health concerns related to the drinking water contamination will be adequately addressed by incorporating appropriate waste effluent treatment and solid waste management systems in the project design.

Excessive illumination at the construction site may potentially cause light pollution, creating public nuisance.

Mitigation Measures

- Protective fencing will be fixed around the construction sites. Unauthorized access within the construction area will not be allowed.
- The local community will be educated regarding the safety hazards at the site.
- The mitigation measures discussed under air quality deterioration, soil and water contamination will address the public health concerns as well.
- Defensive driving practices will be in calculated in the project drivers through trainings, posters and other similar measures.
- Vehicle speeds near/within the communities will be kept low, to avoid safety hazard and dust emissions.
- Road signage will be fixed at appropriate locations along the roadsides.
- Appropriate waste disposal mechanisms will be implemented, as described earlier.
- Appropriate light diffusers and reflectors will be used if required to minimize the public nuisance caused by light pollution.

Residual Impacts

There will be a moderate level of residual impact of safety hazard associated with the vehicular traffic and construction activities.

The residual public health and nuisance issues will be quite negligible after the effective implementation of the mitigation measures.

7.5.12 Damage to Infrastructure

The construction activities and associated vehicular traffic may damage the existing infrastructures in the area, such as roads and culverts.

Mitigation Measures

All damaged infrastructure will be restored to original or better condition.

Residual Impact

After the implementation of the above recommended mitigation measure, there will be a negligible level of residual impact.

7.5.13 Gender Issues

The construction activities, Construction Camp establishment and operation, and Vehicular Traffic may cause some hindrance to women mobility in the area.

Mitigation Measures

- Camp location will be decided in consultation with the local population.
- Construction crew will avoid entering the villages and settlements as much as possible.
- Moral code of conduct will be observed by the construction crew.

Residual Impacts

Despite the implementation of the above mitigation measures, there will be moderate level of residual impact associated with the gender issues.

7.5.14 Sites of Archeological or Historical Significance

There are no reported sites of archeological or historical significance at the land being chosed for the project. However, in case any artifact of such significance is found during the construction activities, the Archeology Department, Government of the Pakistan, will be contacted.

7.6 Operation Phase Impacts

The housing estate operation itself is quite environment friendly and will not cause any significant Environmental degradation. The estate operation activities will interact with different components of the Environment. This interaction may result into the following adverse impacts;

- Soil Contamination (caused by inappropriate waste disposal)
- Surface and ground water contamination
- Water consumption
- Safety Hazards, Public Health and Nuisance
- Damage to infrastructure
- Population Influx

However, the magnitude of most of the above impacts is likely to be much smaller compared to the construction phase impacts.

To ensure harmony of the project with the Environment the project owners will implement sound Environmental Management practices to effectively handle the basic Environmental issues, including;

- Landscaping and Plantation
- Environmentally responsible conduct of personnel, such as hunting and tree cutting
- Noise and other public nuisance abatement

The potential Environmental impacts of the estate O & M activities are discussed below.

7.6.1 Soil Contamination

As discussed in section 7.5.3 and 7.5.4, soil may be contaminated as a consequence of inappropriate waste (solid as well as liquid) disposal.

Mitigation Measures

The mitigation measures recommended under above mentioned sections apply to the operation phase of the project also. These essentially comprise the following;

Solid Waste

- Collection of domestic solid waste from camp site etc.
- Transportation to intermediate disposal site within the area.
- Transportation to the municipal waste disposal site, selected in consultation with the CDA.

Residual Impact

The residual impacts after the implementation of the above measures will be negligible.

7.6.2 Contamination of Surface and Groundwater

The nature of impact of the project's operation activities on the surface and groundwater quality is expected to be quite similar to those predicted for the construction phase in section 7.5.3 & 7.5.6.

Mitigation Measures

The mitigation measures against soil contamination discussed above in Section 7.5.3 for the operation activities will forestall any possible water contamination as well.

Residual Impact

After the effective implementation of the above measures, the residual impacts of the O & M activities on the water resources of the area will be negligible.

7.6.3 Water Consumption

As discussed in Section 7.5.6, the water consumption by the estate can potentially impact the downstream water users.

Mitigation Measures

The water contamination issue has been addressed in Section 7.5.3 & 7.5.6 above. To

address the water depletion issue, the treated water from the sewerage treatment plant will be reused for green area and if any remain it will be released in the natural flowing nullah where it infiltrates into the ground, thus recharging the groundwater aquifer.

Residual Impacts

Despite the above measures, there will be some residual impacts on the downstream water resources. The significance of this impact is expected to be from low to moderate.

7.6.4 Safety Hazard, Public Health and Nuisance

The nature of impacts of the project's operation activities relating to safety hazards, public health and nuisance is expected to be quite similar to those predicted for the construction phase in Section 7.5.11. The estate once fully functional and occupied will generate sizeable vehicular traffic.

Mitigation Measures

The following mitigation measures will forestall any possible impact during the operation phase:

- The mitigation measures discussed under air quality deterioration, soil and water contamination will address the public health concerns as well.
- Defensive driving practices will be inculcated in the project drivers through trainings, posters and other similar measures.
- Vehicle speeds near/within the communities will be kept low, to avoid safety hazard and dust emissions.
- Appropriate waste disposal mechanisms will be implemented, as described earlier.
- Appropriate light diffusers and reflectors will be used where required to minimize the public nuisance caused by light pollution.

Residual Impact

After the effective implementation of the above mentioned measures, the residual impacts of the estate operation activities relating to safety hazards, public nuisance will be negligible.

7.6.5 Damage to Infrastructure

Much like the construction phase, the vehicular traffic during the operation phase can potentially wear out the local infrastructure. However, the magnitude of this impact during this phase is expected to be quite small compared to that during the construction phase, primarily because of the difference in the quantum of activities associated with these phases.

Mitigation Measures

The sponsor will facilitate repair and maintenance of the infrastructure, which is regularly used by the project vehicle.

Residual Impact

The residual impact of the project's operation activities on the local infrastructure is likely to be negligible.

7.6.6 Population Influx

Once the society becomes functional, there will be an influx of the population. Most of the incoming populations will be from Islamabad/Rawalpindi, who will be well alien to local communities.

Mitigation Measures

Mitigation measures are not required for this impact.

7.7 Potential Environmental Enhancement Measures

The preventive, mitigation, compensatory and enhancement measures to be taken up during design, construction and operation stages are listed below.

7.7.1 Mitigation Measures during Design Stage

- Adequate drainage facilities will be provided.
- Provision of approach road.
- Design of the infrastructures like water and electricity supply, drainage and solid waste disposal, with adequate safety margin and as per applicable design codes and norms.
- Provision of adequate green areas.

7.7.2 Mitigation Measures during Construction Phase

Land Environment:

- Proper drainage facilities will be provided along the roads.
- Appropriate measures like green areas plantation would be undertaken.
- The quantity of earth generated from cutting shall be used as filling material during site development.
- The small amount of construction debris and surplus excavated material will be disposed of in suitable pre-identified areas.
- Dumping areas will be biologically reclaimed.

Water Environment:

- The construction activities/erosion would be limited to possible smallest area.
- Control of quality of construction wastewater within the construction site through suitable drainage system with traps for arresting the sediment load for its proposed disposal into the main natural drainage system around the site.
- Implementation of suitable disposal methods of sediment/construction debris in tune with the local condition to avoid water logging at construction site.

- Proper drainage and sanitation facilities shall be provided at the construction site.

Air Environment:

- Proper and prior planning and appropriate sequencing and scheduling of all major construction activities.
- Identification of infrastructural supports needed for the construction programme and ensuring their timely availability.
- Construction materials would be stored in covered stores or enclosed spaces.
- Adequate dust suppression measures such as regular sprinkling of water around vulnerable areas of the construction site by suitable means, to control fugitive dust during construction, material handling/over hauling activities particularly near habitation.
- Stringent construction material handling/overhauling procedures
- Regular inspection of haul roads and construction site should be carried out to ensure regular and timely removal of construction debris to the dumping site.
- Low emission construction vehicles and generator sets should be used.
- It would be ensured that all the vehicles plying during construction are properly tuned and maintained to keep emissions within the permissible limits.
- Construction machinery should be in good working condition and engines turned off when not in use.

Noise Generation:

- Careful planning of the operation of construction equipment is required during this period so that minimum disturbances are caused.
- Construction camp and temporary labour sheds would be located away from the immediate vicinity of the construction site and major road traffic.
- Provision of protective gears such as ear mufflers for construction personnel exposed to high noise levels.
- Low noise construction equipment should be used as far as possible.
- It would be ensured that the equipment used during construction is properly maintained to keep noise emissions within the permissible limits.
- Construction machinery should be in good working condition and engines turned off when not in use.

Biological Environment:

- Avenue plantation is proposed to be implemented.
- Provision of cooking fuel for construction workers to avoid cutting/felling of trees for fuel wood. Wherever possible, site cooking will be avoided.

Social Environment:

- Significant number of semi-skilled and unskilled labourers would be recruited from the nearby areas to create some employment opportunities and sense of wellbeing among local people. This will also reduce social tension.
- Some of the construction materials like stone chips and sand will be procured locally. Thus, there is a possibility of generation of local trading opportunities.
- Most of the construction work is labour intensive. As most of the job will be done by contractors, it will be ensured that the contractor's workers are provided with proper camp facilities including sanitation, drinking water supply, washing facilities and primary health facilities.
- Proper accommodation would be provided in the construction camps for the skilled personnel.
- Adequate safety measures complying with the occupational safety manuals to prevent accidents/hazards to the construction workers.
- Provision of construction camps facilities at designated and demarcated sites for all construction workers with the following amenities:
 - a) Adequate potable water supply
 - b) Adequate sanitary facilities with removable septic tanks
 - c) Washing facilities for the workers
 - d) Solid waste collection and disposal system
 - d) Primary health facilities at construction site
 - e) Electricity

7.7.3 Mitigation Measures during Operation Phase

- Future residents must comply with the CDA Regulations, which make it mandatory for households to use plastic bags, refuse bins and receptacles for the storage of household waste until they are collected by the local authorities.
- Septic tank and Sewerage Treatment Plant will be constructed before sewage disposal.
- The proponent must strictly adhere to the regulations and specifications on water supply and pipe laying works within the building.
- Periodical maintenance of road and drainage system.

SECTION 8 ENVIRONMENTAL MONITORING & MANAGEMENT PLAN

8.0 General

This section provides brief description of environmental issues, mitigation measures to eliminate and/or reduce environmental and social impacts to an acceptable level, institutional arrangement for the implementation of the mitigation measures and also carrying out environmental monitoring for air quality, water quality and noise pollution related parameters.

8.1 Environmental Management

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 construction and operational phases of the proposed project. The proper implementation of the EMP will insure that all the

adverse environmental impacts identified in the EIA are adequately mitigated, either totally prevented or minimized to an acceptable level and required actions to achieve those objectives are successfully adopted by the concerned institutions or regulatory agencies. The implementation of EMP should be carefully coordinated with the design and construction program of the project to ensure that relevant mitigation measures are implemented at the appropriate stage and that adequate resources are properly allocated to achieve the desired results.

For effective environmental management, the client should assign the necessary responsibilities to an environmental committee (EC) through manager environment Faisal Residencia, which should be responsible for environmental monitoring of the proposed project. The project manager environment will be assisted by an environmental engineer and sociologist in implementing the mitigation measures proposed in EMP.

The contractor will be responsible for the implementation of the proposed project under the supervision of the Faisal Residencia Management. The contractor would be bound to follow the provisions of the contract documents especially about environmental protection and apply good construction techniques and methodology without damaging the environment. Obligation of the contractor, to safeguard, mitigate adverse impacts and rehabilitate the environment would be addressed through environmental provisions in the contract document as already highlighted in Section-6 and through adequate implementation at site.

8.2 Staff and Training

8.2.1 Environmental Committee and its Responsibilities

Faisal Residencia management will form up an environmental committee (EC), which will be responsible for the environmental management and supervisory affairs during the construction phase of the proposed project.

The responsibilities of the environmental committee (EC) are as follows: -

- To ensure implementation of all the proposed mitigation measures during and after the proposed project.
- To organize routine monitoring of motor vehicle emissions, air quality, traffic, noise and vibration; etc. In case, the noise and emission levels exceed the acceptable levels; a penalty or ban must be enforced;
- To develop operational guidelines and implementation schedule;
- Receiving complaints from residents and institutions and assisting the local environmental authority including liaison with Pak EPA;

- To ensure that the proposed project is implemented in an environmentally friendly manner, causing least harm to the existing environment including flora and fauna, sites of religious and cultural significance etc; and
- To make sure that the businesses and affecters if any of the proposed project are relocated or compensated in the most judicious manner.

8.2.2 Equipment's and Instruments

Air quality monitoring during different stages of project will be carried out by a private laboratory hired by Faisal Residencia management for comprehensive monitoring during different stages of the proposed project.

8.2.3 Technical Training Programs

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The Environmental committee would play a key role in this respect and arrange the trainings.

Contractor's 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 for the contractor(s)

workforce to implement effective environmental protection measures. A domestic training program is proposed to train the contractor(s) staff who will be involved in the construction phase and the professional staff from the Project Management involved at the operational stage.

8.3 Environmental Monitoring Plan (EMP)

Environmental Monitoring is undertaken both the construction and operational phases to ensure the effectiveness of the proposed mitigation measures. In order to respond to the anticipated environmental concerns at an early stage and to determine the intensity of the impact, prediction is required. Specific monitoring programs are outlined below as well as responsibilities for the collection and analysis of data and the reporting requirements.

The salient objectives of the environmental monitoring plan are: -

- a) To respond to the anticipated and unanticipated environmental impacts when the project is under implementation;
- b) To make regulations and improve traffic management and environmental controls based on the monitoring data. The federal EPA is entrusted with the overall responsibility of monitoring the environment in the Provision;
- c) To evaluate the effectiveness of mitigation measures;

8.3.1 Construction Phase

a) Air Quality

Air quality monitoring will be carried out on quarterly basis during the construction phase at the locations selected by the Environmental Committee (EC).

The following parameters will be monitored:

- CO
- NO₂
- SO₂
- PM₁₀

b) Ground Water Quality

Ground water quality monitoring will be done bi-annually during the construction phase at the locations selected by the Environmental Committee (EC). The following parameters will be monitored:

- Total Coli forms
- Fecal E. Coli

- Total Colony Count
- Fecal Enterococci
- pH Value
- Total Dissolved Solids (TDS)
- Total Hardness
- Fluoride
- Chloride
- Total Suspended Solids (TSS)
- Iron
- Sulphate
- Arsenic
- Conductivity

c) Noise Levels

The noise levels monitoring will be carried out on quarterly basis at representative in the Project Area.

8.3.2 Operational Phase

(a) Air Quality

Indoor Air quality monitoring will be done bi-annually during the operational phase at the representative locations of all the project. The following parameters will be monitored:

- CO
- NO
- NO₂
- SO₂
- PM₁₀

b) Ground Water Quality

Ground water/drinking water quality monitoring will be done quarterly during the operational phase at the locations specified by the Project Management. The following parameters will be monitored:

- Total Coliforms
 - Fecal E. Coli
 - Total Colonial Count
 - Fecal Enterococci
 - pH Value
 - Total Dissolved Solids (TDS)
 - Total Hardness
-
- Fluoride
 - Chloride
 - Total Suspended Solids (TSS)
 - Iron
 - Sulphate
 - Arsenic
 - Conductivity

d) Noise Levels

The noise level monitoring will be carried out quarterly at the locations specified by the Project Management.

8.3.3 Responsibilities for Monitoring and Reporting

The EC will be responsible for environmental monitoring and reporting throughout the construction and operation phases. Environmental monitoring reports for the site will be prepared on quarterly basis and complete record will be maintained at the site office. Contents of the reports will include results of environmental monitoring in comparison to the standards for the various parameters, location and sampling time along with recommendations. One report will be submitted during the construction phase to each of the following authorities and institutions: (i) Project Management and (ii) Pak EPA, whereas, during the operational phase one report will be submitted to the each of the following authorities: (i) Project Management (ii) Pak EPA.

8.4 Environmental Action Plan

The Environmental Action Plan provides the framework for the implementation of the mitigating measures and environmental management and monitoring during the construction and operation phases of the proposed project. **Table 8.1 (a, b & c)** gives portray impacts, targets, mitigations and the responsible organizations for the implementation of the mitigation measures during the design, construction and the operation phases respectively. While **Table 8.2** gives annual estimate for monitoring of the environmental quality parameters during both phases of the proposed Project.

8.5 Environmental Technical Assistance and Training Plan

An environmental and social training and Technical Assistance (TA) program will be carried out to build the FAISAL rESIDENCIA capacity to effectively implement the EMP, as well as to facilitate the improved environmental management of future projects by

increasing the environmental and social awareness of FAISAL RESIDENCIA staff in general. FAISAL RESIDENCIA will engage TA consultant to manage the environmental training program. The objective of the TA will be to help establish appropriate systems, and to train senior staff responsible for managing environment, operations, and planning, who can then impart training at a broader level within and outside the FAISAL RESIDENCIA (i.e., the training of trainers). The TA consultant will organize training courses for FAISAL RESIDENCIA staff, train the staff in specialized areas such as air and noise pollution monitoring; develop environment operation manuals in consultation with the EPA.

Table 8.1(a): Environmental Management Plan (Design Phase)

Aspect	Impacts	Mitigation Measures	Responsibility
Land use	Construction of the proposed Project will affect the land use due to various anthropogenic activities.	<ul style="list-style-type: none"> The design of the proposed Project will be prepared in a way that minimum land use is changed and maximum area will be allocated for the landscape. During the design stage the site activities will be controlled to avoid the change in land use. 	FAISAL RESIDENCIAManagement
Waste/Storm Water Discharge	Improper disposal of sewage/storm water may affect the area.	The designer will design the waste/storm water drainage system according to the following: <ul style="list-style-type: none"> i) National Plumbing Code, USA ii) Building Code of Pakistan 	FAISAL RESIDENCIAManagement
Seismic Hazard	A moderate to high intensity earthquake impacting the Project Site can adversely impact the development.	The proposed structures of the houses and buildings in the FAISAL RESIDENCIA will be designed and constructed to withstand moderate to large earthquakes. For seismic hazard analysis updated structural and seismic evaluations will be consulted.	FAISAL RESIDENCIAManagement
Traffic/Parking Problem	During the operation stage, traffic in and around the Project Area will increase and will cause congestions and parking problems.	Proper traffic management plan will be made in this regard.	FAISAL RESIDENCIAManagement
Ground Water Consumption	Prolonged and high water consumption may in the long run lower the	<ul style="list-style-type: none"> A detailed ground water hydrological study will be conducted to foresee the impact of water extraction and recharge, so that there is no negative 	FAISAL RESIDENCIAManagement

	underground water table.	<p>impact on the surrounding area and delivery of services;</p> <ul style="list-style-type: none"> The Proponents will appoint a consultant to ensure effective project management, efficient use of resources and incorporation of design and infrastructures measures for water and designing of wastewater treatment plant keeping in view the re-use of treated water; 	
Emergency Response	Disasters such as earthquakes, flooding (flash Floods) and other manmade disasters such as fires may occur, which have to be considered for minimizing their impacts.	<ul style="list-style-type: none"> The building regulations of Relevant Authority will be consulted; An Emergency Response Plan will be made to tackle any emergency 	DC
Fire Fighting	Inefficient fire fighting system and insufficient storage of fire water may cause severe damage	<ul style="list-style-type: none"> Emergency Response plan will be made to tackle any emergency related to Fire Fighting 	FAISAL RESIDENCIA Management
Additional Load on Existing Utilities	Water and electricity pipelines, telephone lines and sewerage system will come	<ul style="list-style-type: none"> Engineering Designs & Specifications drawings will be made to tackle all relevant issues 	DC

	under additional pressure because the demand of the Residents will be of a high magnitude.		
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Table 8.1 (b): Environmental Management Plan (Construction Phase)

Aspect	Impacts	Mitigation Measures	Responsibility
Air Pollution	The construction activities produce fugitive and point emissions from different sources. The air emissions may cause health impacts such as dryness and roughness of the throat; eye, nose, throat irritations and coughing etc to the workers and staff of contractor. These emissions may also effect the bio-physical environment.	<ul style="list-style-type: none"> The construction contractor of the Project will ensure regular spraying of water on all temporary service and access roads to minimize the dust generation and regular monitoring of all vehicles, equipment, and machinery used for construction; All vehicles, machinery, equipment and generators used during construction will be kept in good working 	CC, EC &FAISAL RESIDENCIAManagement

		<p>condition and properly tuned and maintained in order to minimize the exhaust emissions;</p> <ul style="list-style-type: none"> • Also, the vehicles carrying construction materials and the construction material storage areas should be covered with tarpaulin. 	
Noise Pollution & Vibration	<p>Exposure to continuous higher noise levels and vibration may induce the following health impacts on the workers such as increase in blood pressure, hypertension etc.</p>	<ul style="list-style-type: none"> • Selection of the up-to-date and well maintained plant or equipment with reduced noise levels ensured by suitable in-built muffing devices; • Confining of excessively noisy areas and limiting the work to normal working hours in the day; • Providing the construction workers with suitable hearing protection like ear cap, or ear 	<p>CC, EC & FAISAL RESIDENCIA Management</p>

		muffs and training them in their use.	
Dust	Prolonged Exposure to dust might result in respiratory tract infections and asthmatic problems to the construction workers, the natives of the area and commuters.	<ul style="list-style-type: none"> • All excavation work will be sprinkled with water; • Construction workers will be provided with masks for protection against the inhalation of dust; and • Vehicle speed on the roads along the Project Site will be prescribed and controlled accordingly. 	CC, EC & FAISAL RESIDENCIA Management
Disposal of Construction Waste/Excavated Material	Dumping of construction wastes/excavated material in the surrounding area may limit the use of land in the Project Area.	<ul style="list-style-type: none"> • Management of Construction activities will be done in a way to ensure minimum degradation to the soil around the Project Area and dumping of excavated waste will be done at a designated site approved by relevant authority; and • The contractors will be bound by contractual obligations to 	CC, EC FAISAL RESIDENCIA Management

		take care of the waste generated from the construction activities.	
Health & Safety of Workers	The health and safety issues are associated with the operation of construction machinery equipment, which may cause minor and severe injuries to workers.	<ul style="list-style-type: none"> • Use of well-maintained machinery and equipment and training of the workers in the construction safety shall be taken; • Provision of protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear, protective goggles, gloves etc.; • A contingency plan in case of major accidents may also be elaborated; and • The safety of the public at all stages of 	CC & EC

		the construction will be ensured through appropriate public education and safety measures such as use of sign boards, barriers and flags and proper illumination at night	
Sanitation and Solid Waste Disposal	If the waste water is allowed to stagnate in water ponds on the site, it can create unhygienic conditions and some of the waste water may also percolate the soil, thereby, polluting the ground water.	<ul style="list-style-type: none"> • The contractor will provide pit latrines, septic tanks for labor camps to treat the sanitary wastewater before its discharge into public sewer; • The solid waste will be collected from the camp site and dumped at a designated site approved by relevant authority. 	CC & EC
Surface/Ground Water	<ul style="list-style-type: none"> • Surface water near the Project Area may further get contaminated due to the disposal of construction waste generated during the project activity; • There is a probability that various materials 	<ul style="list-style-type: none"> • Protection of surface and groundwater reserves from any source of contamination such as the construction and oily waste that will 	CC & EC

	like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater.	<p>degrade its potable quality;</p> <ul style="list-style-type: none"> • The solid waste will be disposed off in designated landfill sites to sustain the water quality for domestic requirements and water required for construction may be obtained in such a way that the water availability and supply to nearby communities remain unaffected; • Quarterly monitoring of the waste water before its final disposal will also be conducted and the results will be compared to the National Environmental Quality Standards (NEQS). 	
Traffic Management	The movement of heavy machinery and transportation of raw material and equipment may cause traffic problems. As the result	<ul style="list-style-type: none"> • Proper traffic management plan will be needed to avoid traffic jams/public 	CC, Traffic Police

	the daily activities of the people nearby localities may be disturbed.	<p>inconvenience ;</p> <ul style="list-style-type: none"> • Movement of vehicles carrying construction materials should be restricted during the day time to reduce traffic load and inconvenience to the local residents; and • The executing agency is required to maintain liaison between the traffic police, local residents/travelers and the contractor to facilitate traffic movement during construction stage. 	
Flora	Construction of the proposed project will not involve any Flora cutting.	<ul style="list-style-type: none"> • New saplings will be planted in place of each uprooted tree/bush around the building to compensate for the loss; • Clearing of land and cutting of trees shall be avoided as far 	EC & FAISAL RESIDENCIA Management

		<p>as possible;</p> <ul style="list-style-type: none"> • Camp sites shall be located in area with minimum vegetation cover; • After construction instead of introducing new ornamental plants, local tree and plant species, as cleared from the Project Site, will be planted for landscaping. In addition to providing a better view to the area, the proposed vegetations will help minimize the excess noise, vehicular emissions and dust pollution. 	
Social/Cultural Disturbances	Problems for the residents of the area/nearby communities may occur due to increased construction/commercial activity	Mitigation measures will include: Adequate training of the work force (involved both in the construction process and in the commissioning) to regard the rituals of the area so that the locals	CC, EC & FAISAL RESIDENCIA Management

		do not feel insecure and local people will be involved by employing them during the construction process	
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Table 8.1(c): Environmental Management Plan (Operational Phase)

Aspect	Impacts	Mitigation Measures	Responsibility
			Implementation
Air Pollution	Increase in traffic volume will also deteriorate the air quality.	<ul style="list-style-type: none"> Traffic management plan will be prepared and implemented by the Project Proponents; Vehicles with excessive smoke emissions will be strictly monitored given warnings; Plantation of maximum number of trees inside the proposed site area 	EC & FAISAL RESIDENCIA Management
Noise Pollution	During the operational stage, noise levels are anticipated to increase. Noise will be generated due to increased activity, movement of vehicles.	<ul style="list-style-type: none"> Appropriate noise control measures will be taken like construction of boundary wall, horns restriction at sound sensitive area, etc. 	EC & FAISAL RESIDENCIA Management
Ground Water	Prolonged water consumption may in the long run lower/deplete the underground water table.	<ul style="list-style-type: none"> An effective water conservation plan will be developed and residents will be trained in operational water conservation measures such as use of water efficient/economy appurtenances and reuse of wastewater for gardening; Utility bills will be kept in track for the consumption of water; Water-saving equipment will always be used and purchased; Treated water from wastewater treatment plant will be used for watering of lawns and other 	FAISAL RESIDENCIA Management

		<p>services; and</p> <ul style="list-style-type: none"> • An effective training program about water conservation will be established. 	
Waste Water	It is anticipated that wastewater will increase the pollution load in terms of Biological Oxygen demand (BOD), Chemical Oxygen Demand (COD) etc	<ul style="list-style-type: none"> • The proponents of the project will construct Sewerage Treatment Plant for treatment to bring the wastewater quality within the NEQS before its final discharge; • The treated wastewater will be reused for watering plants and remaining will be disposed in the nearby flowing natural nullah. 	FAISAL RESIDENCIA Management
Solid Waste	Solid waste if not properly managed otherwise may cause contamination/pollution, nuisance to the residents/visitors and can also become a breeding place of mosquitoes.	<ul style="list-style-type: none"> • Proper solid waste management plan will be made; • Waste will be collected and disposed off at a proper disposal site approved by relevant authority 	FAISAL RESIDENCIA Management & CDA
Emergency Response	The operation of the project will involve accidents. In addition, disasters such as earthquakes and fires may also occur.	<ul style="list-style-type: none"> • A disaster management plan will be made to tackle this issue • Emergency Response Plan will be implemented in close consultation with the Fire Fighting Department, Bomb Disposal Squad and paramedics; and • Training of the residents/management regarding the emergency procedures/plans will be regularly conducted. 	FAISAL RESIDENCIA Management

Traffic Management	During the operational phase, the number of vehicles entering/exiting the project will increase. This may result in traffic congestion	<ul style="list-style-type: none"> • There will be prohibition of roadside parking in front of the Buildings and provision of separate routes for entry and exit to avoid any traffic congestion; and • A traffic management plan will be designed with the help of Traffic Police Department to avoid any traffic related issues. 	FAISAL RESIDENCIA Management & Traffic Police Department
Drinking Water Contamination	Water pollution can originate at the internal water network. If the pipes and the overhead water storage tanks are not cleaned properly, they may lead to bacteriological contamination of the potable/drinking water and thus will lead to infectious diseases/health problems to the residents.	<ul style="list-style-type: none"> • Management of FAISAL RESIDENCIA will install small water filtration units with required capacity in order to avoid any bacterial contamination in the drinking water; • Overhead water storage tank(s) will regularly be cleaned on quarterly basis; • Water Quality Monitoring will also be conducted on quarterly basis and the quality will be maintained according to WHO Guidelines for drinking water 	FAISAL RESIDENCIA Management
Social Disturbances	Construction of the Houses may cause problems for the residents of the nearby areas due to increased construction activity and traffic rush. People might think that due to these activities, their daily routine life is disturbed	<ul style="list-style-type: none"> • Adequate training will be provided to the work force/employees of the FAISAL RESIDENCIA (involved both in construction process and during operational stage) for minimizing disturbance to the locals and a setting up a grievance reprisal system 	FAISAL RESIDENCIA Management

Table 8.2: Budget Estimate for Environmental Monitoring During the Construction and Operation Phases

Components	Parameters	No. of Samples	Frequency	Responsibility	Duration	Cost (Rs.)
Construction Phase (1 year)						
Air Quality	CO, NO _x , SO _x , PM ₁₀	8	Quarterly	Contractor/EC	24 hours	
Ground Water Quality	Total Coliforms, Fecal E. Coli, Total Colonial Count, Fecal Enterococci, pH, TDS, Total Hardness, Nitrate, Chloride, Sodium	8	Quarterly	Contractor/EC	-	
Noise Level	-	4	Quarterly	Contractor/EC	24 hours	
Total						
Operation Phase (1 year)						
Air Quality	Physical,	4	Bi-	Management	24 hours	

	Chemical, and Microbiological parameters.		annually			
Ground/Drinking Water Quality	Total Coliforms, Fecal E. Coli, Total Colonial Count, Fecal Enterococci, pH, TDS, Total Hardness, Nitrate, Chloride, Sodium	2	Every six months	Management	-	
Noise Level	-	4	Quarterly	Management	24 hours	
Total						
Grand Total						

KEY

EC – Environmental Committee

DC Design Consultant

CC Construction Contractor

SECTION - 9**PHOTOGRAPHIC PRESENTATION OF PROJECT AREA**













SOCIAL SURVEY / PUBLIC CONSULTATION









ANNEXURE – I

ANNEXURE – II

ANNEXURE – III

ANNEXURE – IV

ANNEXURE - V