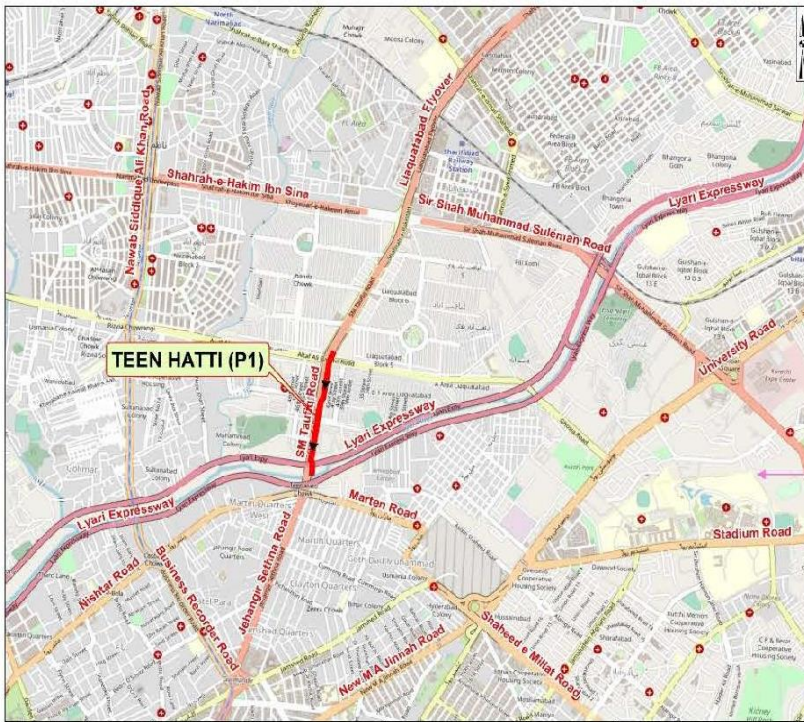




PROJECT IMPLEMENTATION UNIT (PIU), KWSSIP  
KARACHI WATER & SEWERAGE CORPORATION  
(KWSC)



# ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)



## KARACHI WATER & SEWERAGE SERVICES IMPROVEMENT PROJECT, SOP-1 (KWSSIP-1)

### Priority Sewer Network Rehabilitation Sewerage Scheme: P1 (Teen Hatti)

August, 2023



**PRIORITY SEWER NETWORK REHABILITATION  
Scheme P1 (Teen Hatti)**

**Karachi Water and Sewerage Services Improvement Project, SOP-1 (KWSSIP-1)**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)**

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## LIST OF ABBREVIATIONS

AC	Assistant Commissioner
ADB	Asian Development Bank
ADP	Annual Development Plan
AED	Anti-Encroachment Drive
AIDS	Acquired Immunodeficiency Syndrome
AIIB	Asian Infrastructure Investment Bank
ARP	Abbreviated Resettlement Plan
ASL	Above Sea Level
BOD	Biochemical Oxygen Demand
BP	Bank Procedures
CBD	Convention on the Biological Diversity
CBOs	Community-Based Organizations
CC	Construction Contractor
CCR	Community Complaints Register
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CFT	Cubic Foot
CLICK	Competitive and Livable City of Karachi
COD	Chemical Oxygen Demand
CoI	Corridor of Impact
DC	Design Consultant
DCP	Dry Chemical Powder
DED	Detailed Engineering Design
DG	Director General
DMAs	District Metered Areas
DMC	District Municipal Corporation
DMD	Deputy Managing Director
EA	Environmental Assessment
ECO	Economic Cooperation Organization
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EPA	Environmental Protection Agency
ESC	Environmental And Social Cell
ESMMP	Environmental And Social Management & Monitoring Plan
ESMP	Environmental And Social Management Plan
ESS	Environmental And Social Safeguard
FEG	Framework for Economic Growth
GBV	Gender Based Violence
GHG	Green House Gases
GIIP	Good International Industry Practice
GIS	Geographic Information System

GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HDPE	High Density Polyethylene
HHS	Households
HIV	Human Immunodeficiency Virus
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
JICA	Japan International Cooperation Agency
KDA	Karachi Development Authority
KMC	Karachi Metropolitan Corporation
KSDP	Karachi Sustainable Development Project
KW&SC	Karachi Water and Sewerage Corporation
KWSSIP	Karachi Water and Sewerage Services Improvement Project
LG	Local Government
LGD	Local Government Department
LPG	Liquefied Petroleum Gas
MD	Managing Director
MGD	Million Gallons Per Day
MH	Manhole
MSDS	Material Safety Data Sheet
NCS	National Conservation Strategy
ND	Not Detected
NESPAK	National Engineering Services Pakistan
NGO	Non-Governmental Organization
NOC	No Objection Certificate
NRW	Non-Revenue Water
NSL	Natural Surface Level
NTU	Nephelometric Turbidity Unit
O&M	Operation And Maintenance
OHS	Occupational Health & Safety
OIC	Organization of the Islamic Conference
OP	Operational Policy
PAD	Project Appraisal Document
PAPCS	Project Affected Persons Committees
PAPS	Project Affected Persons
PBS	Pakistan Bureau Statistics
PD	Project Director
PGA	Peak Ground Acceleration
PHA	Parks & Horticulture Authority
PIC	Public Information Centers
PIU	Project Implementation Unit
PKR	Pakistan Rupees
PM	Particulate Matter
PPE	Personal Protective Equipment
PPRA	Public Procurement Regulatory Authority

PSHA	Probabilistic Seismic Hazard Assessment
PTR	Pneumatic Tyre Roller
PVC	Polyvinyl Chloride
RCC	Reinforced Cement Concrete
ROW	Right Of Way
RPF	Resettlement Policy Framework
SAARC	South Asian Association for Regional Cooperation
SBC	Seismic Building Code
SC	Supervision Consultant
SDS	Social Development Specialist
SE	Superintendent Engineer
SEPA	Sindh Environmental Protection Agency
SEQS	Sindh Environmental Quality Standards
SMF	Social Management Framework
SOPS	Series Of Projects
SSSD	Sindh Strategy for Sustainable Development
SSWMB	Sindh Solid Waste Management Board
STI	Sexually Transmitted Infections
STP	Sewage Treatment Plant
SWM	Solid Waste Management
TCU	True Color Unit
TDS	Total Dissolve Solids
TP	Treatment Plant
TSS	Total Suspended Solids
UNCCD	United Nation Convention to Combat Desertification
UNESCO	United Nation Educational Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNO	United Nations Organization
URC	Urban Resource Center
USD	United States Dollar
WASH	Water Sanitation and Hygiene
WB	World Bank
WBG	World Bank Group
WSW	West South West
XEN	Executive Engineer

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## UNITS AND SYMBOLS

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\$	United States Dollar
sq.ft	square feet
"	inch
ft	feet
gpd	gallons per day
gpcd	gallons per capita per day
cusecs	cubic feet per second
mm	millimeter
km/ hr	kilometer per hour

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## EXECUTIVE SUMMARY

### 1. Introduction

The Government of Sindh (GoS), through the Karachi Water and Sewerage Corporation (KW&SC), is planning to implement the rehabilitation of sewerage systems in four sewerage schemes of Karachi City (these works will be described as the Proposed Project in this document). The Proposed Project will be implemented under the Karachi Water and Sewerage Services Improvement Project (KWSSIP), which is financed by World Bank (WB), Asian Infrastructure and Investment Bank (AIIB) and GoS. To address the potential environmental and social impacts of the Proposed Project, this Environmental and Social Management Plan (ESMP) has been prepared, in accordance with the WB safeguard policies, following are the guidelines set out in the Environmental Management Framework (EMF) and Social Management Framework (SMF) prepared and approved for the KWSSIP in the year 2019.

Karachi city dominates the economic landscape of Sindh, containing its major industrial and service economy and substantial labor force. Nearly half of its residents live in informal settlements (Katchi Abadis). Only half of the city's water demands are being met, public transport has deteriorated, and pollution is severe. In terms of the numbers of populations, Karachi is one of the ten largest cities in the world with an estimated population around 16 million (Pakistan Bureau of Statistics - 2017). The increase in population is putting heavy pressures on the physical, infrastructural, financial and institutional systems of the city.

Karachi's water supply services are falling far short of the expanding city's needs. Nearly three million residents lack access to piped water and even those formally connected experience inadequate, irregular and inequitable service. Brackish groundwater limits the use of household wells, so inefficient and expensive private water tankers are a major source of domestic water supply.

More than 6 million residents lack access to public sanitation services in the city. Those lacking access typically discharge sewage through the storm water system, natural drains or informal sewers directly into rivers and ultimately the sea. Pit latrines and septic tanks are used by less than 3 percent of the population. Even those with nominal access to public sewerage do not receive acceptable services. The city's sewage treatment facilities are dilapidated and mostly dysfunctional because of "complex challenges of inadequate and damaged sewer trunk mains, malfunctioning pumping facilities, and a lack of wastewater treatment capacity".

To address the above issues, KW&SC has conceived KWSSIP in the form of a series of projects (SOPs), which form a long-term program to address the serious water and sewerage service gaps in the rapidly growing city of Karachi. The following SOPs<sup>1</sup> have been planned under KWSSIP:

SOP-1: Focuses on reforms, maintenance and rehabilitation

SOP-2: To scale-up investments

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<sup>1</sup> (2019). Project Appraisal Document on a proposed loan to the Islamic Republic of Pakistan for a Karachi Water and Sewerage Services Improvement Project (KWSSIP).

SOP-3: Will focus on increasing water production and financing investments to ensure the additional wastewater created can be treated

SOP-4: Will focus on improving services in informal settlements based on experience gained under the previous projects.

Currently, SOP-1 (or KWSSIP-1) is under implementation, whereas the SOP-2 is under preparation. The rehabilitation works under SOP-1 are organized in three lots given in **Table ES-1** below.

**Table ES- 1: Rehabilitation Works under SOP-1**

Sr. No.	Description	Activity
1	Assignment -A	Rehabilitation of water supply and sewerage in three low-income communities (the Proposed Project)
2	Assignment -B	Priority Water Network Rehabilitation including operation and maintenance (O&M) equipment, meters & district metered areas (DMAs) to reduce non-revenue water (NRW)
3	Assignment -C	Priority Sewer Network Rehabilitation

The environmental and social screening of the project reveals that the project interventions will have moderate to low environmental impacts and thus classified as Category B, which requires the preparation of Environmental and Social Management Plan (ESMP). The current document present ESMP for the construction of Sewerage Scheme named Teen Hatti (hereafter referred as 'P1').

## 2. Policy, Legal and Administrative Framework

The national and provincial governments have promulgated laws/acts, regulations, and standards for the protection, conservation, rehabilitation, and improvement of the environment. The Ministry of Climate Change is the responsible authority for environmental protection policy-making in Pakistan whereas Sindh Environmental Protection Agency (SEPA) is the regulatory authority in Sindh, which provides guidelines for conducting Environmental Impact Assessment (EIA)/ ESMP studies and has the authority to issue regulatory clearance/ No Objection Certificates (NOCs) for various projects.

In addition to the laws of the land, World Bank Operational Policies (OPs) are also applicable to the project including Environmental Assessment (OP 4.01), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP 4.12), Gender policy (OP 4.20), and Access to information (BP 17.50).

## 3. Project Description

The proposed project involves the provision of sewerage network (i.e., P1) in Teen Hatti area. Scheme P1 is located in Liaquatabad Town, which is situated in the District Central, Karachi. The project area is on the northern side of Lyari river, North-Western side of North Nazimabad Town and North-Eastern side of Gulberg Town.

The project area is facing grave issues related to sewerage system. A sewer line is proposed on Shahrah-e-Pakistan/ SM Taufiq Road having a total length of 2,852ft (0.87KM). The said

scheme will collect the sewage from the catchment area and will ultimately connect with Lyari interceptor leading to TP3. The total catchment area is 349.21 acres with the designed population of 270,934 persons. The total cost of the project is **438.45 million PKR**.

#### **4. Baseline Profile**

Baseline study is intended to identify and establish all the physical, ecological and social environmental conditions, prevailing before the execution of the project, to use this information as a reference datum to associate future changes and judge them if the conditions have changed for better or worse.

##### **A. Physical Environment**

According to the findings of Topographic survey report groundwater levels in Teen Hatti (P1) sewerage scheme is in the range of 42-54 feet (ft) above sea level (A.S.L).

Geotechnical investigations at the proposed project sites reveal that on-site soil mostly comprise silty sand and silty sand with gravels. However, at various depths, well graded sand with silt, poorly graded sand with silt in loose to very dense state and lean clay, lean clay with sand were also present in stiff to hard state, up to maximum investigated depth of 12 m below natural surface level (NSL).<sup>2</sup>

The project area has moderate climate. It has hot summer and mild winters. The summer starts from May and lasts till September. May and June are the hottest month. The mean maximum temperature is observed 35 °C for the month of May. The winter seasons lasts from November to February. January is the coldest month. The mean maximum and mean minimum temperature ranges from 27 °C to 12 °C in January.

Karachi is a coastal city at the coast of Arabian sea. Surface water resources of Karachi include three major rivers named as Indus, Lyari and Malir. Rivers Malir and Lyari basins are the two main basins which drain about 80 percent of the surface runoff of the city<sup>3</sup>. Surface runoff is collected by hundreds of small and large channels in the basins, finally draining into the Arabian sea.

The proposed project area is located in seismic zone 2B, where 2B (upper moderate damage zone) represents peak horizontal ground acceleration from 0.16 to 0.24g.

##### **B. Biological Environment**

The project sites are residential and commercial areas having domestic animals (street dogs, cats, rats, lizards and worms etc.) only. Furthermore, there is a minimal tree cover of native species in and around the project area which will not be affected by the proposed project activities.

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<sup>2</sup> Geotechnical Investigation Report, Assignment-C

<sup>3</sup> 2020, Implementation of storage and dewatering infrastructure for waste material removed from storm water drain in Karachi, EIA, SSWMB.

## C. Social Environment

The socioeconomic baseline has been established using both primary and secondary data. The secondary data was collected through District Census Reports (2017), SMF (2019) and EMF (2019). The primary data was collected through door-to-door surveys, individual interviews, focused group discussions and consultation meetings.

The population to be served under sewerage Scheme-P1) is approximately 177,855 persons. The survey area is predominantly made up of Muslim community. The trend of getting education is quite low which may be due to financial constraints. A high percentage of the respondents in P1 are illiterate. Due to low education level, the livelihood sources of the respondents are limited to the labor works and small businesses including shops/ kiosks etc.

The sex ratio in the project area is 1.08. The women in the project area do not have equal access to job opportunities as well as educational opportunities. There is lack of mother-child health care units and women have to travel adequate distances to reach such facilities.

The situation of basic amenities including sewerage, solid waste collection is deplorable and the people face long hours of electricity load shedding. Masoom Shah Darbar is the only shrine which is present near the sewerage scheme. However, no Non- Governmental Organization (NGO) & Community-Based Organizations (CBO) is working in the proposed project area of sewerage scheme-P1

## 5. Public Consultation and Information Disclosure

Engagement of stakeholders (consultation) and information disclosure is an integral part of the project's environmental and social assessment. The methods used for public consultation with project stakeholders to ascertain their stakes regarding project implementation were interview survey, general/public meetings, and on-site meetings.

Different categories of interested parties including project staff, government officials, and local communities were consulted to predict the nature and scale of risks, challenges and impacts of project perceived by them.

The general remarks of the public and government officials include that the project is beneficial for the above-mentioned areas of Karachi as well as neighboring districts; the project will be beneficial in terms of good sewerage lines available of these areas.

Following are the key findings of the consultation meetings:

**Table ES- 2: Findings of Consultation Meetings**

Sr. No	Concerns Raised	Response
1	There is an existing sewerage line but sometimes the manholes get chocked, resulting in overflowing of sewers.	The existing lines shall be replaced with the new lines of larger diameters depending upon the flows. The issue of chocking and overflowing shall be addressed with this action.



Sr. No	Concerns Raised	Response
2	The area gets inundated during rainy seasons.	There will be provision of storm water in the proposed sewerage network. The issue will of storm water will be somehow resolved with the proposed project.
3	Nursery owner near Daak Khana Chowk was of the view that his business shall be affected during the execution of the project.	The concerned person was apprised that he has access from three sides of the road. During execution, access from one only side shall be restricted and others will remain functional.
4	Construction activities should be taken up at night time for minimal disturbance of Business and general traffic.	The schedule of activities shall be shared with the local community and business operators before commencement of the work. Efforts will be made to minimize the disturbance of business operations. Furthermore, the affected persons will be paid for their losses of business due to restricted access.
5	The residents of the Teen Hatti also demanded that that KWSSIP should bound the contractor to hire the relevant skilled and un-skilled labour/ workers from the local community.	Local community will be preferred to work as skilled and semi-skilled labours.
6	There are mosques and other religious places in the P-01 (Teen Hatti), efforts should be made to minimize the impacts on them due to construction activities.	The construction work will be planned keeping in view the prayer timings. Furthermore, the work will be executed in pockets to minimize the disturbance.
7	The construction contractor should be closely monitored to complete the activities, and none of the open trenches should be left unattended and backfilled immediately after laying of pipes/sewers.	The project activities will be monitored by the PIU as well as the supervision consultant. Contractor will be bound to backfill all the open trenches and no patches shall remain open.
8	Along the route the commuters will face mobility issues, it must be avoided to the maximum	Traffic management plan shall be developed to avoid the disruption of commuters during construction time.
9	Noise and dust will be generated from construction activities and may cause health issues.	Regular sprinkling of water will be carried out to control the dust emissions at the construction site

## 6. Anticipated Environmental Impacts & Mitigation Measures

The construction activities would cause changes in topography, soil contamination, surface & groundwater pollution, air pollution, noise & vibration, solid waste generation, disturbance to flora and fauna, overburdening of resources, construction camps issues, health & safety issues, emergency situations, traffic disruption and social issues. All these impacts can be mitigated by adopting prescribed mitigation measures and ensuring good workmanship during the execution of the project.

Anticipated impacts during the operational stage will include water pollution, air pollution, soil contamination, ecological disturbance, solid waste generation, occupational health & safety issues and emergency situations.

The positive impacts of the project include, improved sewerage system, improvement in public health, hygiene and sanitation, landscape, economic development, and employment generation.

## 7. Environmental & Social Management & Monitoring Plan

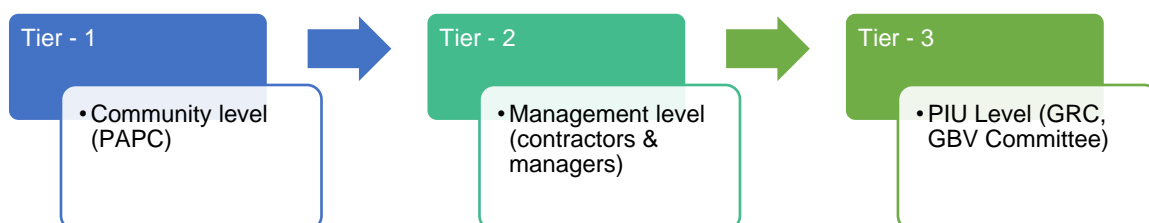
Recommended mitigation measures to control potential adverse impacts are described in the Environmental & Social Management Plan (ESMP). ESMP shall become the part of construction contract agreement and shall be strictly enforced during the implementation of the proposed project.

The project activities will be monitored and managed by the PIU-KWSSIP. The Environmental and Social Cell (ESC) staffed with qualified environmental and social specialist has already been established under PIU-KWSSIP. The ESC will be the custodian of the ESMP. ESC will support to ensure the compliance of ESMP. ESC will submit progress report for the implementation of the ESMP to WB and SEPA as per environmental approval/ NOC conditions for the KWSSIP.

### Grievance Redress Mechanism

The Grievance Redress Mechanism (GRM), outlines the policy and procedure for documenting, addressing, responding and employing methods to resolve project grievances (and complaints) that may be raised by the PAPs or community members arising from environmental and social performance, the engagement process, and unanticipated environmental or social impacts resulting from project activities, the behavioral issues of the project team that resulted GBV or harassment that are performed and/or undertaken by PIU.

The project shall have multi-tier GRM with designated staff responsibilities at each level i.e., Community-level, management level (contractors and Managers), and PIU-level (GRC and higher management). At the community-level, Project Affected Persons Committees (PAPCs) and GRM focal points, will be one female and one male. While at the management level, there are GRM focal points of managers and contractors. Finally, at the PIU level, GRC and GBV committee have been constituted.



The complaints may be lodged through:

- A prescribed form available online at KWSSIP website through Grievances Redressal Mechanism Icon;
- Complaint by post on the specified address;
- On a dedicated landline telephone number/line, which will be received by the GRM receiving officer;
- The grievance may be dropped in the complaint box placed at the working site;
- Complaint through e-portal of KWSSIP which is available in different languages including Sindhi, Urdu and English and is easily accessible from the mobile phones; and
- Complaints at Customer Services Center of KW&SC.

The GRC will acknowledge the complaints within one day of receipt and will review available records and the fact finding will be completed within 10 days from receipt of complaints. The GRC in its formal meeting to be conducted within 20 days from receipt of complaint will hear and clarify with the complainant (if required so) about the issue and shall conclude and communicate its recommendations for further implementation.

### **Environmental Budget**

The total cost for implementation of ESMP has been worked out as **PKR 10,091,550 /-**. The cost in the construction phase will be the responsibility of the Contractor while KW&SC shall bear the cost in operational phase.

## 1 INTRODUCTION

### 1.1 Overview

The Government of Sindh (GoS), through the Karachi Water and Sewerage Corporation (KW&SC), is planning to implement the rehabilitation of sewerage system in Teen Hatti area of Karachi City (these works will be described as the Proposed Project in this document). The Proposed Project will be implemented under the Karachi Water and Sewerage Services Improvement Project (KWSSIP), which is financed by World Bank (WB), Asian Infrastructure and Investment Bank (AIIB) and GoS. To address the potential environmental and social impacts of the Proposed Project, this Environmental and Social Management Plan (ESMP) has been prepared, in accordance with the WB safeguard policies, following the guidelines set out in the Environmental Management Framework (EMF) and Social Management Framework (SMF) prepared and approved for the KWSSIP in the year 2019.

### 1.2 Project Background

Karachi city dominates the economic landscape of Sindh, containing its major industrial and service economy and substantial labor force. Nearly half of its residents live in informal settlements (Katchi Abadis). Only half of the city's water demands are being met, public transport has deteriorated and pollution is severe. In terms of the numbers of populations, Karachi is one of the ten largest cities in the world with an estimated population around 16 million (Pakistan Bureau of Statistics (PBS) - 2017). The increase in population is putting heavy pressures on the physical, infrastructural, financial and institutional systems of the city.

Karachi's water supply services are falling far short of the expanding city's needs. Nearly three million residents lack access to piped water and even those formally connected experience inadequate, irregular and inequitable service. Typical service quality is "two hours every two days to four hours per day at very low pressure", with rationing widespread especially in Katchi Abadis which face severe shortages of water". Brackish groundwater limits the use of household wells, so inefficient and expensive private water tankers are a major source of domestic water supply. The city's current water demand is estimated at 1,210 million Gallons per Day (MGD) and the current supply shortfall is estimated as 550 MGD.

More than 6 million residents lack access to public sanitation services. Those lacking access typically discharge sewage through the storm water system, natural drains or informal sewers directly into rivers and ultimately the sea. Pit latrines and septic tanks are used by less than 3 percent of the population. Even those with nominal access to public sewerage do not receive acceptable services. The city's sewage treatment facilities are dilapidated and dysfunctional because of "complex challenges of inadequate and damaged sewer trunk mains, malfunctioning pumping facilities, and a lack of wastewater treatment capacity<sup>4</sup>".

To address the above issues, KW&SC has conceived KWSSIP in the form of a series of projects (SOPs), which form a long-term program to address the serious water and sewerage

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<sup>4</sup> (2019). Project Appraisal Document on a proposed loan to the Islamic Republic of Pakistan for a Karachi Water and Sewerage Services Improvement Project (KWSSIP).

service gaps in the rapidly growing city of Karachi. The following SOPs have been planned under KWSSIP:

SOP-1: Focuses on reforms, maintenance and rehabilitation

SOP-2: To scale-up investments

SOP-3: Focus on increasing water production and financing investments to ensure the additional wastewater created can be treated

SOP-4: Focus on improving services in informal settlements based on experience gained under the previous projects

## SOP -1

The SOP1 of KWSSIP has been designed in following three components:

- Component 1- Reform in Karachi Water and Sewerage Corporation
- Component 2 - Securing Sustainable Water Supply & Sewerage (Infrastructure investments)
- Component 3 - Project Management and Studies

### Component – 2

The Component-2 of SOP-1 consists of the following three (03) assignments. The description of activities and their allocated budget are given in **Table 1.1**:

**Table 1.1: Detail of Component-2 of SOP-1, KWSSIP**

Sr. No.	Description	Activity	Cost (\$)
1	Assignment Part-A	Rehabilitating water supply and sewerage in three low-income communities	5 million
2	Assignment Part-B	Priority Water Network Rehabilitation including O&M Equipment, Meters & DMAs to Reduce NRW	20 million
3	Assignment Part-C	Priority Sewer Network Rehabilitation	22 million

The environmental and social screening of the project reveals that the project interventions will have moderate to low environmental impacts and thus classified as Category B project based on World Bank's operational policies, which requires the preparation of Environmental and Social Management Plan (ESMP). The current document present ESMP for the construction of Sewerage Scheme named Teen Hatti (hereafter referred as 'P1').

### 1.3 Objective of ESMP

The major objective of this ESMP is the identification of possible and induced environmental and social impacts of the proposed project on both short and long-term bases. Based on the level and nature of these observations, the ESMP then delineates proper mitigation measures.

The specific objectives of this ESMP are:

- To assess the existing environmental and socioeconomic conditions of the project area;

- To identify potential impacts of the proposed interventions on the environmental, ecological and social aspects of the project area, to predict and evaluate these impacts and determine their significance;
- To propose appropriate generic mitigation measures that should be incorporated in the design of the project to avoid or minimize (if cannot eliminate) the potentially adverse impacts;
- To assess the compliance status of the proposed activities with respect to the national and provincial environmental legislation and WB's OPs;
- To provide institutional, monitoring, reporting and documentation measures for environmental safeguards compliance; and
- To aid decision makers to take informed decisions.

#### **1.4 Scope of ESMP**

The ESMP identifies the potentially significant impacts of the proposed project and suggest the applicable mitigation measures to avoid, minimize or reduce the magnitude of the impacts. It will also indicate the institutional and training requirements to implement mitigation measure during the construction and operation of proposed project.

The current ESMP presents a preliminary roadmap for environment and social management for construction and operation of the proposed project. As discussed earlier, the proposed project is under the Category B in view of its associated environmental and social impacts, which means that the project impacts are not envisaged to go beyond the project boundaries. The immediate surroundings of the project area i.e., 200 meters strip has been defined as the corridor of impact (CoI) and the potential impacts within the CoI have been focused to design the mitigation measures.

#### **1.5 Contractual Requirements/ Obligations of ESMP**

The impacts and their mitigation measures, summarized in the ESMP, will be integral part of the Bidding Documents making it mandatory to Contractor, Subcontractors and their nominees to adhere to its requirements throughout the project construction phase.

With the assistance of the Supervision Consultant (SC), the Project Implementation Unit (PIU) will monitor compliance of the ESMP implementation by the Contractor.

At the bidding stage, the Contractors must consider the environmental and social management requirements contained in this ESMP when preparing their bids and pricing Work items. The Contractor must acknowledge that the ESMPs provisions and clauses are an integral part of the Contract, except for separate items in the Bill of Quantities (BoQs). Payment will not be separately made for ESMP compliance. Failure by the Contractor or Subcontractors to implement ESMP recommendations may lead the Engineer to take serious actions to ensure compliance and/ rectify any resulting damages. The actions may include the suspension/ halt of project activities, imposing penalties & fines, or in the worst-case suspension of the services.

The contractor will be required to prepare and submit Contractor's Environmental and Social Management Plan (CESMP) and get its approval from the PIU before commencement of the construction.

The Contractor will be required to provide the human and financial resources necessary to progress and achieve statutory compliance and implementation of the Contract and the ESMP. The Contractor shall carry out his/her duties as required in the ESMP implementation which shall include but not necessarily be limited to the following:

- Maintaining up to date records on actions taken by the Contractor regarding the implementation of ESMP requirements;
- Timely submission of reports, information, and data;
- Participation in the meetings convened by the PIU, and
- Any other assistance requested by the PIU as specified in the bid documents including Health & Safety (HSE) arrangements at site, hiring of relevant HSE staff and providing secure work environment

The Contractor will provide Monthly Monitoring Report within 10 days of the following month to the supervision consultant, relative to the implementation of the requirements contained in the ESMP and the results of the environmental and social performance monitoring.

## **1.6 Approach & Methodology to Work**

### **1.6.1 Approach**

The study has been conducted in accordance with World Bank Safeguards policies (OP 4.01, OP 4.11, OP 4.12, OP 4.20 & BP 17.50) applicable to this project. Further, Sindh Environmental Protection Agency (SEPA) guidelines were also considered in preparation of this document. The study is based on both primary and secondary data and information. The primary data includes data collected from field i.e., information about existing conditions; environmental sampling and analyses for air, water and noise; environmental sensitive receptors, ecological survey; social survey including demographic characteristics, income dependency & quality of life, occupation, and social amenities etc. The secondary data includes a review of relevant information from literature and previous reports. Discussions were held with stakeholders including government officials, community representatives and a wide range of local people along proposed sewer lines. The main purpose of this approach was to obtain an impartial understanding of the people's perceptions about the project and its environmental and social impacts.

The assessment remains subject to change with respect to finalization of technical specifications and alignment of the proposed sewer lines.

### **1.6.2 Methodology**

The following methodology was adopted to develop the ESMP of the proposed Project:

## **A. Orientation**

Meetings and discussions were held among the members of the ESMP Consulting Team. This activity was aimed at achieving a common shared understanding of various issues of the Study between the Consultants and the PIU.

## **B. Data Collection Planning**

Subsequent to the concept clarification and understanding obtained in the preceding step, a detailed data acquisition plan was developed for the internal use of the ESMP Consulting Team. The plan included; identification of specific data requirements and their sources; determination of time schedules and responsibilities for their collection and indication of the logistics and other support needed for the execution of the data acquisition plan. Field surveys were then conducted based on the data collection plan.

## **C. Detailed Field Survey**

Detailed site visits for collection of data were conducted from October 26 to November 12, 2021; November 25 to December 7, 2021; February 28 to March 4, 2022 and April 5 to April 23, 2022.

The data collected from field include:

- Identification of environmental and social sensitive receptors including air sensitive receivers, noise sensitive receivers and water bodies expected to receive pollutant load; educational institutes, religious places, health facilities, water bodies etc.;
- Sampling and analysis for air, noise and water;
- Ecological survey;
- Socioeconomic survey including public consultation;
- Stakeholders' consultations

## **D. Sampling & Analysis of Physical Environmental Parameters**

M/s HSE Services Laboratory (SEPA Certified Laboratory) was hired for environmental monitoring. The Laboratory was mobilized on June 24, 2022.

## **E. Review of Secondary Data**

Following documents were consulted for collection of secondary information:

- Project Appraisal Document (PAD) for KWSSIP (2019);
- Environmental Management Framework (EMF) for KWSSIP (2019);
- Social Management Framework (SMF) for KWSSIP (2019);
- District Census Reports (DCRs) etc. (2017).



## **F. Review of Environmental and Social Laws and Institutional Requirements**

The project needs to comply with all the applicable national and provincial environmental and social policies, laws, guidelines, acts and legislations and World Bank's Operational Policies (OPs) requirements. All these requirements and policies were reviewed.

## **G. Corridor of Impact (Col)**

The area of influence is the area likely to be affected by the project, including all its ancillary aspects. The Col includes the areas where positive and adverse impacts may be foreseen due to the implementation of the proposed project. The Col of 200 m has been marked for the current study.

A team of environmental and social experts, including environmental engineers, sociologist, gender specialist & enumerators. carried out the environmental and social survey of the Col. These initial surveys helped in identification/ demarcation of Col. In case of this sewerage scheme, the boundary of the scheme has been defined as the Col and the potential impacts within the Col have been focused to design the mitigation measures.

## **H. Environmental and Social Baseline Survey of the Project**

Environmental and social survey was carried out within the Col to establish the baseline of the project area during October 26 to November 12, 2021; November 25 to December 7, 2021; February 28 to March 4, 2022 and April 5 to April 23, 2022. Prior to the start of field activities, comprehensive checklists, proformas and maps were developed to gather the following information:

### **(i) Physical Environment**

Following information was acquired for the establishment of physical environment baseline:

- Topography;
- Water resources (including available surface and groundwater resources and natural streams, hydrology, water supply, water contamination etc.);
- Climate data (including temperature, precipitation, humidity, wind speed, direction etc.);
- Water, Surface Water, Ambient air quality and noise level monitoring data;
- Existing water supply and sewerage systems;
- Seismology;
- Land resources (including land use pattern, soil & geology); and
- Environmental Sensitive Receptors.

### **(ii) Ecological Environment**

- Flora (trees, herbs, shrubs, grasses and overall vegetation including valuable or rare trees and their loss due to implementation of the Project etc.).

### **(iii) Socio-Economic Environment**

A sample survey was carried out within the Col to develop the socio-economic baseline information of the settled population. The proposed sewerage line covers a catchment area of 349 acres serving approximately 0.2 million people. However, under the present project, only 0.87 km of the sewerage line along the main road is proposed for rehabilitation. The Col of the proposed line is a commercial area with various shops/markets as well as numerous small kiosks. The total number of shops and kiosks along the alignment was enumerated to be 43 with a total workforce of 215. Based on a random socio-economic survey, 59 managers and lower staff (appx 25% of the workforce) in the area were interviewed. The following major aspects were covered in the socio-economic baseline survey of the sample population settled along the Col:

- Demographic characteristics;
- Literacy status/ education;
- Nature of business/occupation;
- Livelihood/income;
- Living standard of the population;
- Social Infrastructure available;
- Gender issues;
- Housing construction patterns;
- Mode of transports;
- Basic social amenities of project area including health and education facilities; and
- Other aspects such as including mechanism of conflict resolution, presence of NGOs/CBOs, and physical/cultural resources etc.

### **I. Stakeholder Consultations**

For the current study, stakeholder consultations were carried out through following techniques:

- Formal/ informal meetings;
- Individual interviews;
- Group Discussions; and
- Scoping Sessions

The study team met with the government functionaries, affected persons and local communities in and around the project area. The objective of the consultation was to disseminate information on the project and its expected impact, long-term as well as short-term, among primary and secondary stakeholders and to gather information on relevant issues so that the feedback received could be used to address these issues at an early stage.

### **J. Impact Assessment and Mitigation Measures**

A logical and systematic approach based on comprehensive survey and consultations was adopted for impact identification and assessment. The process began during the screening and continued through scoping which identified the key issues and classified them into

different categories. The tools, which were used for impact assessment, through Checklists (Environmental and social /gender screening) for both construction and operational phase.

Identification of potential environmental and social impacts in terms of their nature, magnitude, extent, location, timing and duration were carried out. The impacts were correlated to the Project location, design stage, construction as well as operation stage. Based on the impacts prediction methods and as a result of public/stakeholder consultations, ESMP team screened the adverse environmental and social impacts for inclusion in the mitigation measures and environmental and social management plan. Stakeholder consultations (which provided feedback on the impacts from the stakeholder's viewpoint) were used to screen out the insignificant impacts.

ESMP team strived to propose practicable, economically feasible and socially acceptable mitigation measures for the significant adverse environmental and social impacts. These measures were based on exploring the ways to achieve the project objectives causing least disturbance to the existing environment by alternative ways, proposing changes in the Project design, through improved monitoring and management practices (storage of construction materials, labour camps, waste disposal, disposal of construction debris etc. or through monetary compensation).

## **K. Environmental and Social Management Plan**

The data collected from the field was analyzed and the impacts of the proposed project on the physical, biological and socio-economic environment prevalent in the project area were identified and characterized with respect to significance and probability of occurrence at the design, construction, operation and decommissioning phases. Possible mitigation measures and implementation mechanisms are proposed so that the impacts can be mitigated / controlled and the project implementation remains sustainable.

### **1.7 Structure of Report**

The structure of this report is listed below:

**Section 1: Introduction** briefly presents the project background, objectives, methodology and need of the study.

**Section 2: Legal and Administrative Framework** Lists national as well as provincial laws, regulations and procedures and applicable World Bank Operational Policies (OPs).

**Section 3: Project Description** provides an overall description of the project including proposed networks, design considerations and concepts, manpower requirement, waste generation, machinery and material requirements.

**Section 4: Baseline Environmental & Social Conditions** gives a description of baseline physical, biological and socio-economic conditions of the project area.

**Section 5: Public Consultation and Information Disclosure** identifies the main stakeholders and their concerns raised during scoping sessions and deals with the measures to mitigate the social impacts.

**Section 6: Potential Environmental and Social Impacts and their Mitigations Measures** identify, predict and evaluate impacts of the project activities during the construction and operation stages and deals with the measures proposed to mitigate potential environmental impacts of the proposed project.

**Section 7: Environmental and Social Mitigation and Monitoring Plan** outlines organizational framework, mitigation and monitoring plans, training requirements, defines roles and responsibilities, estimates budgets requirements for satisfactory implementation.

**Section 8: Conclusion and Recommendations** gives the conclusion of the impact assessment study and recommendations for the construction and operational stages.

## 2 LEGAL AND ADMINISTRATION FRAMEWORK

### 2.1 General

This section deals with the current environmental policy as well as legal and administrative framework required to develop the Environmental & Social Management & Monitoring Plan (ESMMP) for the proposed interventions in Priority Sewer Network Rehabilitation in project area. All relevant provisions of environmental policies laid down by the Government of Pakistan and GoS along with applicable World Bank Policies have been duly discussed and the project proponent will be required to adhere to these regulations throughout the course of the project. The institutional arrangement for compliance with these laws has been described in ESMMP (Section 7).

### 2.2 Summary of Key National Legislations

The relevant national legislations are briefly described in chronological order in **Table 2.1**:

**Table 2.1: Relevant National Legislations**

Sr. No.	National Legislations	Brief Coverage	Relevance to project
1.	Fatal Accidents Act 1855	This is an Act to provide compensation to families for loss occasioned by the death of a person caused by actionable wrong.	This law shall be applicable for community-related accidents.
2.	Pakistan Penal Code 1860	Every person shall be liable to punishment under this Code and not otherwise for every act or omission contrary to the provisions thereof, of which he shall be guilty within Pakistan. It authorizes fines, imprisonment, or both for damaging public properties.	The provisions of the Penal Code, 1860 are applicable to the project in terms of penalties for affecting public property and assets.
3.	Land Acquisition Act, 1894 (Including Later Amendments)	The primary law for the acquisition of land for public purposes in Pakistan is the "Land Acquisition Act, 1894". The Land Acquisition Act, 1894, is a "law for the acquisition of land needed for public purposes and for companies and for determining the amount of compensation to be paid on account of such acquisition". The exercise of the power of acquisition has been limited to public purposes. The principles laid down for the determination of compensation, as clarified by judicial pronouncements made from time to time, reflect the anxiety of the law-giver to compensate those who have been deprived of property, adequately.	The project does not involve private land acquisition. However, this has been stated if any of the project interventions in future involve any land acquisition, though it is very much unlikely.
4.	Protection of Trees and Bushwood Act, 1949	This Act prohibits cutting or lopping of trees and brushwood without permission of the Forest Department. The Forest Department will be approached for permission to cut trees along the proposed project site.	The KMC and PHA shall be approached to seek permission to cut trees if any of the trees have to be cut. However, presently

Sr. No.	National Legislations	Brief Coverage	Relevance to project
			no trees are envisaged to be cut.
5.	Pakistan Antiquities Act 1975	The protection of cultural resources in Pakistan is ensured by the Antiquities Act of 1975. Antiquities have been defined in the Act as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments etc. The act is designed to protect antiquities from destruction, theft, negligence, unlawful excavation, trade and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area, which may contain articles of archaeological significance. No objection certificate (NOC) would be requested from Director General (DG) Archeological Department for construction within 200 feet of cultural heritage sites.	The provisions of this Act would also be applicable, if any accidental archaeological discoveries are made during the excavation works for the construction of proposed Project.
6.	The Protection Against Harassment of Women at the Workplace Act, 2010	The Protection Against Harassment of Women at the Workplace Act, 2010 is a legislative act in Pakistan that seeks to protect women from sexual harassment at their place of work, and equally applicable to this project.	This Act shall be applicable to ensure protection of women in the implementation of the proposed project.
7.	Pakistan Labor Laws	Labor rights in Pakistan specified under Articles 11 and 17 of the constitution of Pakistan, shall be applicable to the proposed project. More specific laws are described separately. The laws are relevant to the project.	This law will be applicable in terms to provide proper labor rights to the labor of the project site.

### 2.3 Summary of Key Provincial Legislations

The relevant provincial legislations are briefly described in chronological order in **Tables 2.2:**

**Table 2.2: Provincial Legislations**

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
1.	Sindh Cultural Heritage (Preservation) Act, 1994	This provincial Act empowers the Government of Sindh to preserve and protect any premises or objects of archaeological, architectural, historical, cultural, or national interest in Sindh by declaring them protected. Karachi alone has over 200 buildings declared as "Protected Heritage" by the Government of Sindh. An NOC will be required from the Department of Culture, Tourism and Antiquities if any protected site is identified along said project.	No site of physical/ cultural importance has been identified within the COI of the proposed project. However, a Chance Find Procedure has been annexed in case some objects of archaeological or historical importance

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
			are found during construction /excavation activities.
2.	Sindh Plantation, Maintenance of Trees and Public Parks Ordinance, 2002	The Sindh Plantation, Maintenance of Trees and Public Parks Ordinance, 2002 prohibits the cutting of trees in the project area and prior permission from the Local Government Department (LGD - GoS) shall be needed as per the ordinance for any tree cutting activity during the project construction.	No trees shall be cut down during the implementation of the project. However, plantation shall be done in the project area for environmental enhancement.
3.	Sindh Strategy for Sustainable Development, 2007	The Sindh Strategy for Sustainable Development (SSSD) proposes a ten-year sustainable development agenda for Sindh. Its purpose is to highlight the ecological, economic and social issues of the province and to provide recommendations and strategic actions to address them. The strategy promotes the sustainable use of natural resources to achieve the objectives of poverty alleviation and social development through the participation of the people of Sindh.	This can be applicable to KWSSIP in terms of environmental sustainability, integrated development, community participation and institutional development.
4.	Sindh Public Property (Removal of Encroachment) Act, 2010	<p>The Act is to provide measures for removal of encroachment from public property and to retrieve possession; it is expedient to provide measures for removal of encroachment from public property and to retrieve possession.</p> <p>Sindh Public Property (Removal of Encroachment) Act, 2010 "Public Property" is defined, to be a building, land, place or premises vesting, in or under the management or control of Government, local council, autonomous body or registered cooperative society or such other authority.</p>	The current land ownership status of the project areas will be assessed under this Act.
5.	The Sindh Industrial Relations Act, 2013	An Act to regulate the formation of trade unions, regulation, and improvement of relations between employers and workmen, and the avoidance and settlement of any differences or disputes arising between them and ancillary matters and as such relevant	The Act shall be applicable to avoid any disputes between the employer and workmen/labor.
6.	The Sindh Environmental Protection Act, 2021	Subject to the provisions of this Act and the rules and regulations, no person shall discharge or allow the discharge or emission of any effluent, waste, pollutant, noise or any other matter that may cause or likely to cause pollution or adverse environmental effects.	A meeting was held with Deputy Director (Technical), SEPA regarding submission of requisite environmental

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
			document. It was conveyed that IEE is required for SEPA before commencement of the project (Refer Schedule 2, Section I, of SEPA regulations 2021).
7.	Sindh Solid Waste Management Board (SSWMB) Act, 2014	The SSWMB Act, 2014 enacted to establish a board for collection and disposal of all solid waste, to arrange effective delivery of sanitation services, to provide pollution free environment and to deal with other relevant matters. The Board established under the Act headed by the Chief Minister or his nominee and constitutes of thirteen other ex-officio members of other relevant departments.	KWSSIP will dispose the waste generated during construction and operation phases in coordination with SSWMB.
8.	Sindh Minimum Wages Act, 2015	This act provides for the regulation of minimum rates of wages and various allowances for different categories of workers employed in certain industrial and commercial undertakings and establishments. The contractors and operators of the project will be bound to pay wages to the labor and employees as per the requirement of this act.	The contractors will ensure to pay remunerations to the labor and employee as per obligation of this act.
9.	The Sindh Bonded Labor System (Abolition) Act, 2015	Act to provide for the abolition of bonded labor system in the Province of Sindh. Whereas clause (2) of Article 11 of the Constitution of the Islamic Republic of Pakistan prohibits all forms of forced labor. It is necessary to provide for abolition of bonded labor system with a view to prevent the economic and physical exploitation of the labor class in the Province of Sindh.	The contractor shall not engage bonded-labor and forced labor during execution under this Act.
10.	The Sindh Commission on the Status of Women Act, 2015	Sindh Commission on the Status of Women was set up for the promotion of social, economic, political and legal rights of women, as provided in the Constitution of the Islamic Republic of Pakistan 1973, and in accordance with international declarations, conventions, treaties, covenants and agreements relating to women, including Convention on the Elimination of all forms of Discrimination against Women (CEDAW).	The project shall ensure adequate participation of women in the project and will ensure social and domestic protection of women under this Act.
11.	Sindh Workers Compensation Act, 2015	This Act is expedient to provide for the payment by certain classes of employers to their workers or their legal heirs of compensation for injury or death by accident.	Adherence to the act is mandatory in case of injury or loss of life of any worker.
12.	The Sindh Transparency	The Sindh transparency and right to information act is to provide for promoting transparency in the working of	The current project is public welfare project



Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
	and Right to Information Act, 2016	every public authority by setting out a practical regime for every citizen to secure access to information in a rapid and low-cost manner under the control of public authorities, the constitution of a Sindh Information Commission and for matters connected therewith or incidental thereto.	and the public has right to access all the project-related information.  The PIU-KWSSIP shall ensure easy access to such information under this Act.
13.	Sindh Environmental Quality Standards, 2016	<p>Standards for the following types of effluent and emissions are stated in the SEQS and may be related to the specified projects:</p> <ul style="list-style-type: none"> <li>• Municipal and liquid industrial effluent parameters (32) for discharge to inland waters, sewage treatment facilities, and the sea</li> <li>• Industrial gaseous emissions (16) into the atmosphere</li> <li>• Motor and vehicle exhaust and noise (3 to 5)</li> <li>• Ambient air quality (9)</li> <li>• Drinking water quality (33)</li> <li>• Noise standards for residential, commercial, industrial, and silence zones</li> </ul> <p>SEQS apply to both discharge and ambient pollutant concentrations: gaseous emissions and liquid effluents discharged by batching plants and construction machinery, and ambient air quality and ambient noise. The standards for motor vehicle exhaust and noise apply through the construction as well as operation stage of the project will need to be accounted.</p>	SEQS shall be adopted in the project design and their compliance shall be ensured during construction and operation of the project.
14.	Sindh Sanitation Policy, 2017	The main purpose of this policy is to provide better sanitation service and to make sure that the entire population of Sindh has excess to a safely managed sanitation service and sanitary environment that is also nutrition sensitive and hygienic.	The project involves provision of better sanitation facilities in the project areas.
15.	Sindh Occupational Safety and Health Act, 2017	Act to make provision for occupational safety and health conditions at all workplaces for the protection of persons at work against risk of injury arising out of the activities at work places and for the promotion of safe, healthy and decent working environment adapted to the physical, physiological and psychological needs of all persons at work;	The Construction Contractor and PIU shall ensure the safety of workers and other staff by adopting adequate safety measures under this Act.

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
16.	The Sindh Differently Able Person Act, 2017	This Act is to provide for the employment, rehabilitation and welfare of differently able persons.	The differently able persons will be provided compensation of their loss, if any. Furthermore, the Contractor will be advised to hire the local labor, especially the project affected persons and differently able persons at site if they can fit in any role.
17.	The Sindh Prohibition of Employment of Children Act, 2017	An Act to prohibit the employment of children and to regulate the employment of adolescents in certain occupations and processes to be taken place within provincial boundaries.	The Act prohibits and regulates the employment of children less than 14 years and is applicable to the project and the Contractors and sub-contractors will have to comply with this Act.
18.	The Sindh Local Governments (Amendment) Act, 2021	<p>The Sindh Local Government Bill, 2021 has been passed by the Provincial Assembly of Sindh on 11th December, 2021 and assented by the Governor of Sindh on 24<sup>th</sup> December, 2021.</p> <p>This act is expedient to establish an elected local government system to devolve political, administrative and financial responsibility and authority to the elected representatives of the local governments; to promote good governance, effective delivery of services and transparent decision making through institutionalized participation of the people at local level and to deal with ancillary matters.</p>	The local government shall be taken on board in decision making and implementation of the proposed project. Furthermore, the Local government representatives will provide support during the construction and implementation of the project.
19.	Sindh Environmental Protection Agency (Environmental Assessment)	Sindh EPA has notified Environmental Assessment Regulations, 2021, which set out procedures for environmental assessment studies, review, and approvals.	IEE is required for SEPA before commencement of the project (Refer Schedule 2 of SEPA regulations 2021, Section I).

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
	Regulations, 2021		
20.	Factories Act, 1934 and The Sindh Factories (Second Amendment) Act, 2021	This is an act to consolidate and amend laws on labor rights and for matters connected to their safety, basic welfare facilities including living, food, occupational health including infectious diseases and protection from those infectious diseases; it also covers the work-related hazards and protection from those hazards, shelters facilities during rest time, restriction of working hours and holidays rules etc.	The Sindh amended law is for the rights of labor works in the province of Sindh and applicable to the proposed works.
21	The Sindh Resettlement and Rehabilitation (R&R) Policy 2023	The Sindh Resettlement and Rehabilitation (R&R) Policy 2023 is a comprehensive policy has been introduced by the Government of Sindh in Pakistan to address the adverse effects on people caused by past and ongoing development projects. The policy covers all types of displacement caused by development projects, natural disasters, and non-development project-related anti-encroachment drives (AEDs) or eviction of informal settlers by the Government. The key objective of the policy is to avoid and/or minimize displacement and resettlement by exploring alternative options and technical designs to the extent feasible.	The project does not involve physical resettlement, however, there would be economic disturbance due to restriction in access during execution of the project. Furthermore, the project has been screened in view of Anti Encroachment Drive (AED).

## 2.4 Applicable World Bank Policies

### 2.4.1 World Bank Operational Policies

The World Bank operational policies applicable to the project and its compliance mechanism, are summarized in the description below in **Table 2.3**:

**Table 2.3: Relevant World Bank Operational Policies**

Sr. No.	World Bank Operational Policies	Brief Coverage	Relevance to SOP-1, KWSSIP	Relevance to sub-project
1.	Environmental Assessment (OP 4.01)	Under this OP, the World Bank requires environmental assessment (EA) of projects proposed for Bank's financing to help ensure that they are environmentally sound and sustainable and thus to improve decision making through appropriate analysis of actions and of their likely environmental impacts.	Environmental assessment studies will be conducted for all the subprojects under SOP-1	The current ESMP has been prepared in the light of OP 4.01.

Sr. No.	World Bank Operational Policies	Brief Coverage	Relevance to SOP-1, KWSSIP	Relevance to sub-project
2.	Physical Cultural Resources (OP 4.11)	<p>This policy seeks to assist in the preservation of cultural property. The Bank normally will assist only those projects that are sited or designed so as to prevent any damage to physical cultural resources.</p> <p>There is very little chance that during the construction of proposed project, sites of cultural, archaeological, historical, or religious significance might be encountered. However, in case of discovery of any such sites or artefacts during the project implementation, the site will not be selected if significant cultural sites are going to be affected or alternate options for the design of the proposed projects will be developed. However, in every situation, the provisions of this Policy will be applied.</p>	This operational policy is applicable to avoid any damage to the cultural heritage sites	This operational policy is applicable to avoid any damage to the cultural heritage present in the sub-project area.
3.	Involuntary Resettlement (OP 4.12)	<p>This Policy seeks to avoid involuntary resettlement where feasible, or to minimize, exploring all viable alternative project designs. Where resettlement avoidance is not feasible, resettlement should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable displaced persons to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs. Projects should assist displaced persons to improve or, at least, restore livelihoods to pre-displacement levels or to levels prevailing prior to the beginning of project implementation or whichever is higher.</p>	The policy is triggered as various subprojects of SOP-1 include economic displacement.	The proposed activities are envisaged to cause economic displacement due to restricted access during execution of the project. The Project Affected Persons (PAPs) shall be compensated under OP 4.12.

Sr. No.	World Bank Operational Policies	Brief Coverage	Relevance to SOP-1, KWSSIP	Relevance to sub-project
4.	Gender policy (OP 4.20)	The objective of the Bank's gender and development policy is to assist associate countries to curtail poverty and improve economic growth, human well-being, and development effectiveness by addressing the gender disparities and inequalities that are barriers to development, and by assisting member countries in formulating and implementing their gender and development goals, and the Bank occasionally assesses the gender dimensions of development.	The objective of this operational policy is to avoid any gender discrimination and provide proper opportunities to both male and female where applicable for human well-being.	The objective of this operational policy is to avoid any gender discrimination and provide proper opportunities to both male and female where applicable for human well-being.
5.	Access to information (BP 17.50)	The World Bank's Policy on Disclosure of Information is to be open about its activities and to welcome and seek out opportunities to explain its work to the widest possible audience. The Bank has broadened the scope of information about its activities that it makes publicly available. The Bank has established the Info-Shop at headquarters, plus regional Public Information Centers (PICs), to serve individuals seeking to obtain Bank information. In addition, Country Offices are encouraged to establish modest PIC services for their country clientele. This policy is triggered for proposed projects categorized as A and B. The developer consults project affected groups and local NGOs: a) during scoping and before TORs are prepared; b) when the draft EA is available; and c) throughout project implementation as necessary. The developer provides relevant information in a timely manner prior to consultation and in a form and language accessible to the groups being consulted.	This operational policy is applicable as to disclose all the relevant information about the project to the local community to avoid any unnecessary conflicts at construction site.	This operational policy is applicable as to disclose all the relevant information about the project to the local community to avoid any unnecessary conflicts at construction site.

## 2.4.2 Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labor Influx Guidelines

This guidance note provides direction on identifying, assessing and managing the risks of adverse social and environmental impacts that are associated with the temporary influx of labor resulting from Bank supported projects. The guidance note contains guiding principles and recommendations to be considered as part of the design and implementation of projects with civil works that require labor from outside the project's area of influence.

## 2.4.3 Environmental, Health & Safety (EHS) Guidelines

In addition to operational policies (OP), the WBG has also established its EHS guidelines for all the interventions that are financed by the group. These EHS Guidelines are technical reference documents with general and sector-specific examples of Good International Industry Practice (GIIP). Following EHS guidelines are relevant to the proposed project during the construction and operation phase:

**General EHS Guidelines:** Issues associated with the construction and operation of maintenance facilities are addressed in the General EHS Guidelines with other key element like environment and occupational health and safety (OHS) at workplace as well as for community.

**EHS Guidelines for Water & Sanitation (2007):** Issues associated sanitation are presented in the EHS Guidelines for Water and Sanitation (2007).

## 2.4.4 International Protocol/ Conventions

As Pakistan is a member of a number of international organizations such as United Nations Organization (UNO), Organization of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC), Economic Cooperation Organization (ECO) etc., so it has to follow the international protocols and obligations related to the environment. The major protocols, ratification dates by Pakistan and obligations related to the proposed project are provided in the **Table 2.4** below.

**Table 2.4: International Agreements/Conventions Relevant to the Project**

Sr. No	Agreement/ Convention	Ratification	Description/Relevance
1.	UNESCO Convention on the Protection of the World's Cultural and Natural Heritage <sup>5</sup> , 1972	Pakistan ratified this convention on 23 July 1976.	<p>Convention concerning the Protection of the World Cultural and Natural Heritage - requires parties to adopt a general policy on the protection of the natural and cultural heritage, to set up services for such protection, to develop scientific and technical studies, to take appropriate legal, technical, scientific and administrative measures and to foster training and education for such protection.</p> <p>The proposed project design and E&amp;SS team paid due attention to archaeological sites and local norms. Both factors will also be considered during project implementation.</p>
2.	The Rio Declaration, 1992 <sup>6</sup>	Pakistan signed the treaty on June 13, 1992 and ratified on 1 June 1994	<p>The Rio Declaration comprises 27 principles which address important issues such as; sustainable development to integrate environmental protection into the development process; common but differentiated responsibilities to conserve, protect and restore the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption.</p> <p>The proposed interventions shall promote sustainable development and environmental issues shall be given due consideration in the design and implementation.</p>
3.	Kyoto Protocol, 1992 <sup>7</sup>	Pakistan has ratified Kyoto Protocol in 2005	<p>The Kyoto Protocol is a protocol to reduce greenhouse gasses that cause climate change.</p> <p>One hundred and thirty-seven (137) developing countries have ratified the protocol, including Brazil, China, India</p>

<sup>5</sup> (1972). UNESCO Convention on the Protection of the World's Cultural and Natural Heritage, <http://whc.unesco.org/en/%20convention%20text/>

<sup>6</sup> (1992). The Rio Declaration, [http://www.unesco.org/education/pdf/RIO\\_E.PDF](http://www.unesco.org/education/pdf/RIO_E.PDF)

<sup>7</sup> (1992). Kyoto Protocol, [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol)

Sr. No	Agreement/ Convention	Ratification	Description/Relevance
			<p>and Pakistan but have no obligation beyond monitoring and reporting emissions.</p> <p>All the carbon emissions due to interventions (i.e., sewer lines, sewage treatment plant etc.) in the proposed project shall be rectified using standard engineering practices.</p>

## 2.5 Institutions Responsible for Planning, Policies and Regulations

The institutional setting in Karachi has traditionally comprised of various agencies at federal, provincial and local government (LG) levels with separate land areas, separate legal and administrative frameworks, and engaging in little institutional coordination.

### 2.5.1 Sindh Environmental Protection Agency (SEPA)

Implementation of SEPA 2014 is the mandate of the Sindh Environmental Protection Agency (Sindh EPA). Sindh EPA is headed by a Director General, and sections are headed by directors, i.e., Director Technical, Director Administration and Finance, and Director Laboratory. Sindh EPA has established District Environment Offices in a few districts. IEE is required for SEPA before commencement of the project.

### 2.5.2 Karachi Water and Sewerage Corporation (KW&SC)

Karachi Water and Sewerage Corporation (KW&SC) comes under the provincial government but operates as an independent organization. It is responsible for sewage disposal for the city of Karachi and is involved in initiatives for improved sewage disposal. It is also responsible for provision of water to the city of Karachi. The KW&SC is a vertically-integrated entity, with functions including wholesale supply and treatment, transmission and distribution of water, wastewater collection, treatment/disposal, and revenue collection.

KW&SC was established under the KW&SC Act, 1996 as an autonomous body with its own Board of Directors, and a Managing Director who was also a Board Member. The 'Board' is controlled directly by the provincial government. The chairman and vice chairman of the Board were directly appointed by the provincial government.

### 2.5.3 Karachi water and Sewerage Services Improvement Project (KWSSIP)

Karachi Water & Sewerage Services Improvement Project (KWSSIP), funded by World Bank and AIB, is an initiative of Government of Sindh (GoS) and KW&SC to improve water and sewerage services in Karachi. KWSSIP has been planned after detailed discussion among all stakeholders in Karachi with World Bank, technical experts and consultants, and aims to bring the targeted institutional and governance reforms in Karachi Water and Sewerage Board along



with a massive strategic investment program for the improvement of water & sewerage infrastructure in Karachi.

### 3 PROJECT DESCRIPTION

The proposed project involves the provision of sewerage network (i.e., P1) in Teen Hatti area. Scheme P1 is located in Liaquatabad Town, which is situated in the District Central, Karachi. The project area is on the northern side of Lyari river, North-Western side of North Nazimabad Town and North-Eastern side of Gulberg Town.

#### 3.1 Project Location

Scheme P1 lie in Liaquatabad Town, which is situated in the District Central, Karachi. Sewerage Scheme P1 is proposed to start near Daak Khana Chowk, Liaquatabad and will be laid on Shahrah-e-Pakistan. Scheme P1 is located on the northern side of Lyari river, North-Western side of North Nazimabad Town and North-Eastern side of Gulberg Town. It will finally dispose into Lyari Interceptor which is connected with Treatment Plant 3 (TP3). Location map of P1 shown in **Figure 3.1**.

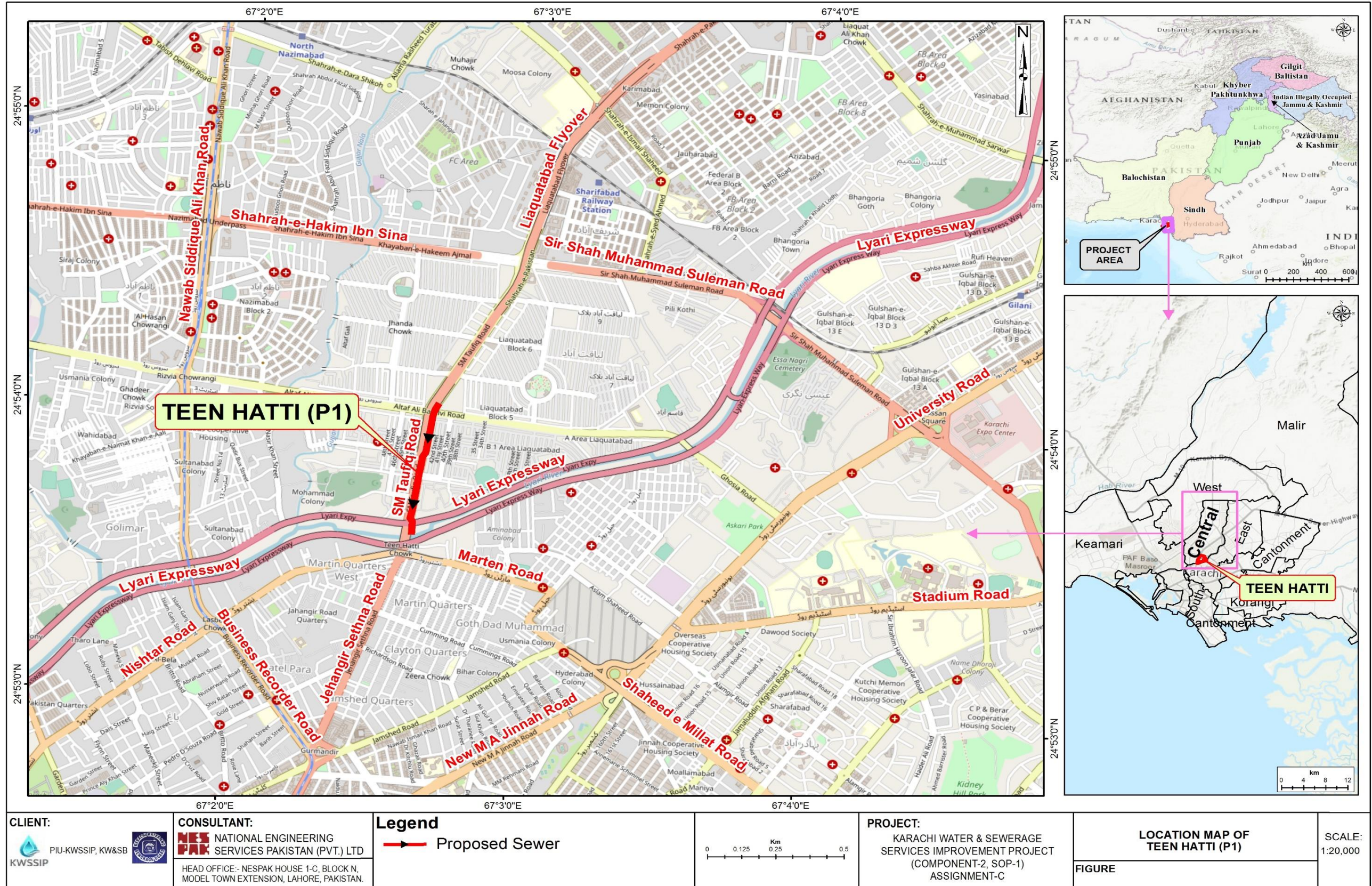


Figure 3.1 : Location Map of Scheme P1

## 3.2 Project Description

A brief description of the proposed project components is given hereunder:

### 3.2.1 Existing System

The existing sewerage network of proposed project areas is described below:

#### A. Existing System of Sewerage Scheme P1 – Teen Hatti (Liaquatabad)

Sewerage scheme P1 covers catchment area of 349.19 acres including Upper Liaquatabad Blocks 5 to 10 and Blocks E and B1 near Teen Hatti Bridge. Sewage from Block 5 is collected via 15 inches sub-main sewer laid along Altaf Ali Brelvi Road which connects to the 42 inches trunk sewer on Shahrah-e-Pakistan. Sewage from Blocks 6, 7, 8 and 9 is collected via lateral sewers of 8 inches diameter sewer which are connected to sub-main sewers of 15 inches diameter. These sub-main sewers are connected to trunk sewer of 42 inches diameter on Shahrah-e-Pakistan. Approximately half of the sewage from Block 10 is collected via network of laterals of 8 inches diameter and connected to 15 inches sub-main sewer on 9 No. main road which finally connects to 42 inches trunk sewer on Shahrah-e-Pakistan; the other half is collected via 24 inches trunk sewer on Sir Suleman Shah Road and catered in sewerage scheme P2. Trunk sewer main of 42 inches diameter discharges the collected sewage from above-mentioned areas into Lyari River under Teen Hatti Bridge. Sewage from Blocks E and B1 is collected via 15 inches sub-main sewers and discharged into the road side drain. The existing sewerage network along with the catchment area of Scheme P1 is given in **Figure 3.2** below:

The major issues identified and informed by the KW&SC officials in this scheme are:

- Main issue faced in the catchment is the connection of sewers of area E and B1 to bed level of road side Nullah. In case of rainfall or high flows in the drain, sewage from these areas either faces back flows or remains stagnant which causes ponding.
- At present, the existing untreated sewage is being disposed into Lyari River which is a nuisance and causing environmental degradation, unhygienic conditions & potential health hazards.
- The trunk line has exhausted its design life and needs replacement w.r.t future needs.
- The existing sewerage network in areas is over 25 years old and need replacement due to crown failure/sinking at some places.
- Dumping of solid waste into sewers/open drains and lack of periodic de-sludging/de-silting is resulting in choking/blocking of the network in many places.
- During rainstorms, the existing sewerage system overflows and creates unhealthy environmental conditions and damage to public infrastructure and property.
- There is no provision of stormwater in the capacity of sewers; therefore, during rainfalls, the stormwater is forcibly discharged into sewers (by opening of manhole covers or puncturing of pipes) to avoid hue and cry of population. This results in entrance of silt, debris, solid waste into the sewage network resulting in choking/blockage of entire network

The glimpses of existing site conditions are given in **Annex-I**

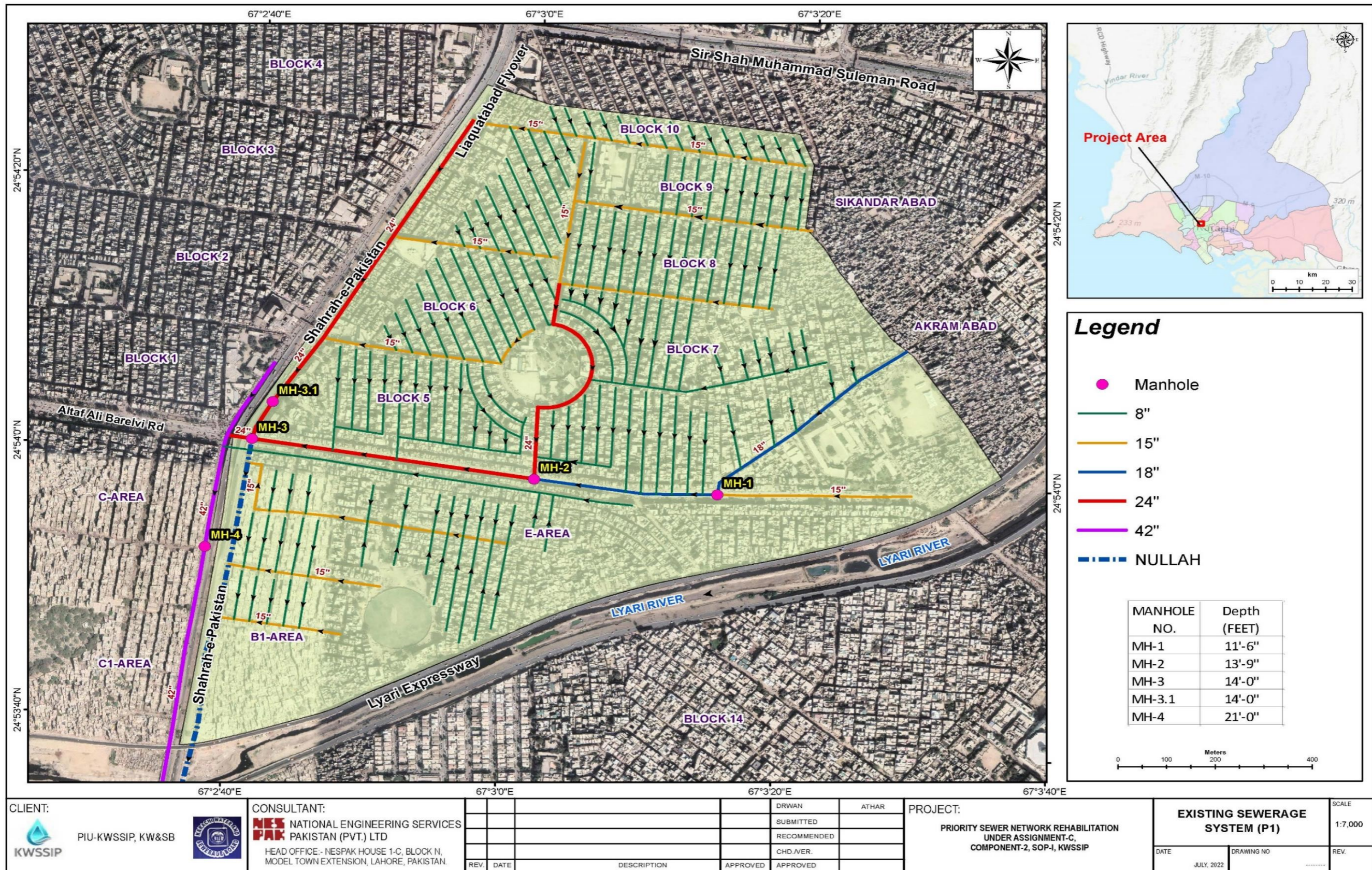


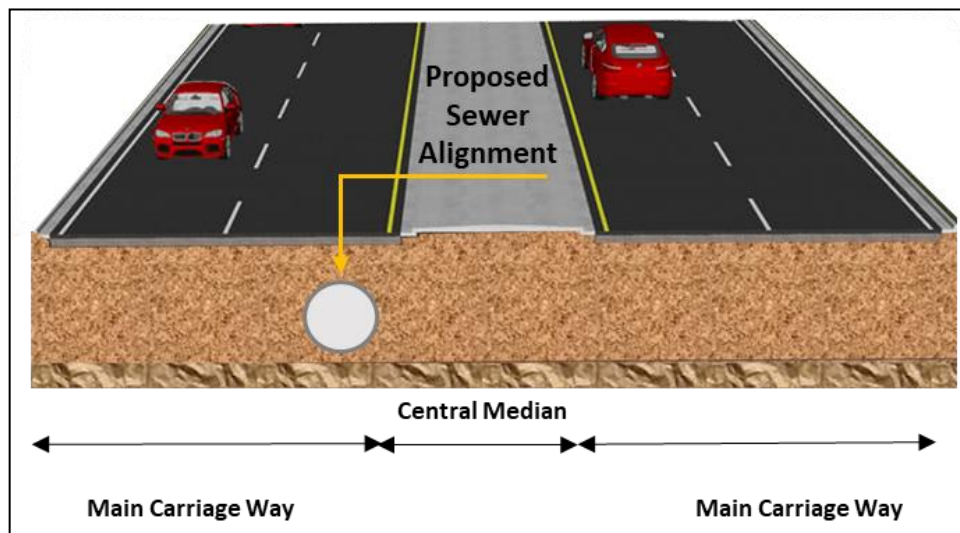
Figure 3.2: GIS Map of Existing Sewerage System

### 3.2.2 Proposed Option for Laying the Sewers

In order to alleviate social issues and minimize the Project Affected Persons (PAPs) due to the proposed project activities detailed deliberations were carried out with PIU. In this regard, the alignment of the sewerage lines and construction methodology was devised to minimize the disturbance. The said alignments and methodology were discussed in Feasibility Study which has been approved by PIU, WB & AIB technical and E&SS experts. In the current scenario, the ROW of road on which sewer is proposed contains no service road but contains central Median, the alignment of sewer line will be along the edge of Central Median between main carriage ways as shown in **Figure 3.3**.

In this way, one lane will be available for the movement of traffic and access will be open to the roadside vendors, hawkers and shopkeepers. Although the sewer will be proposed in high-speed lane but trunk sewers once installed are seldom opened during operation stage. During the cleaning period of trunk sewers, in vogue safety precautions will be adopted. Further, same practice already exists in KW&SC at many places.

Construction methodology is proposed in a way, that daily trench area excavation will be limited to 30-40 feet and the same will be backfilled after laying the pipeline on daily basis to avoid piling of excavated material. The access of the livelihood/ business in the working areas will not be disturbed and the working area within their business radius will not be affected. In this way neither PAPs will be encountered nor any compensation will be required. However, minimal PAPs may be encountered on corners or intersections where ROW is reduced or congested.



**Figure 3.3: Proposed Sewer Alignment Option**

### 3.2.3 Proposed System

The proposed interventions in the priority sewerage schemes are summarized hereunder:

## A. Proposed System

The basic design parameters of Scheme P-1 are given below:

• Catchment Area	=	349.21 acres
• Design Population (2050)	=	270,934 Persons
• Sewage Generation	=	80% of 40 gpcd = 32 gpcd
• Total Design Flow (by 2050)	=	32.14 cusecs
• Length of Scheme	=	0.87 km (2,852 ft)
• Elevation Difference	=	42.18 ft to 54.43 ft

The project involves provision of a new sewer line which will be able to reduce the load on existing sewer. The proposed project does not involve the replacement of existing sewers completely, however, a portion of the existing sewers between only two manholes will be replaced. The existing sewer will remain operational.

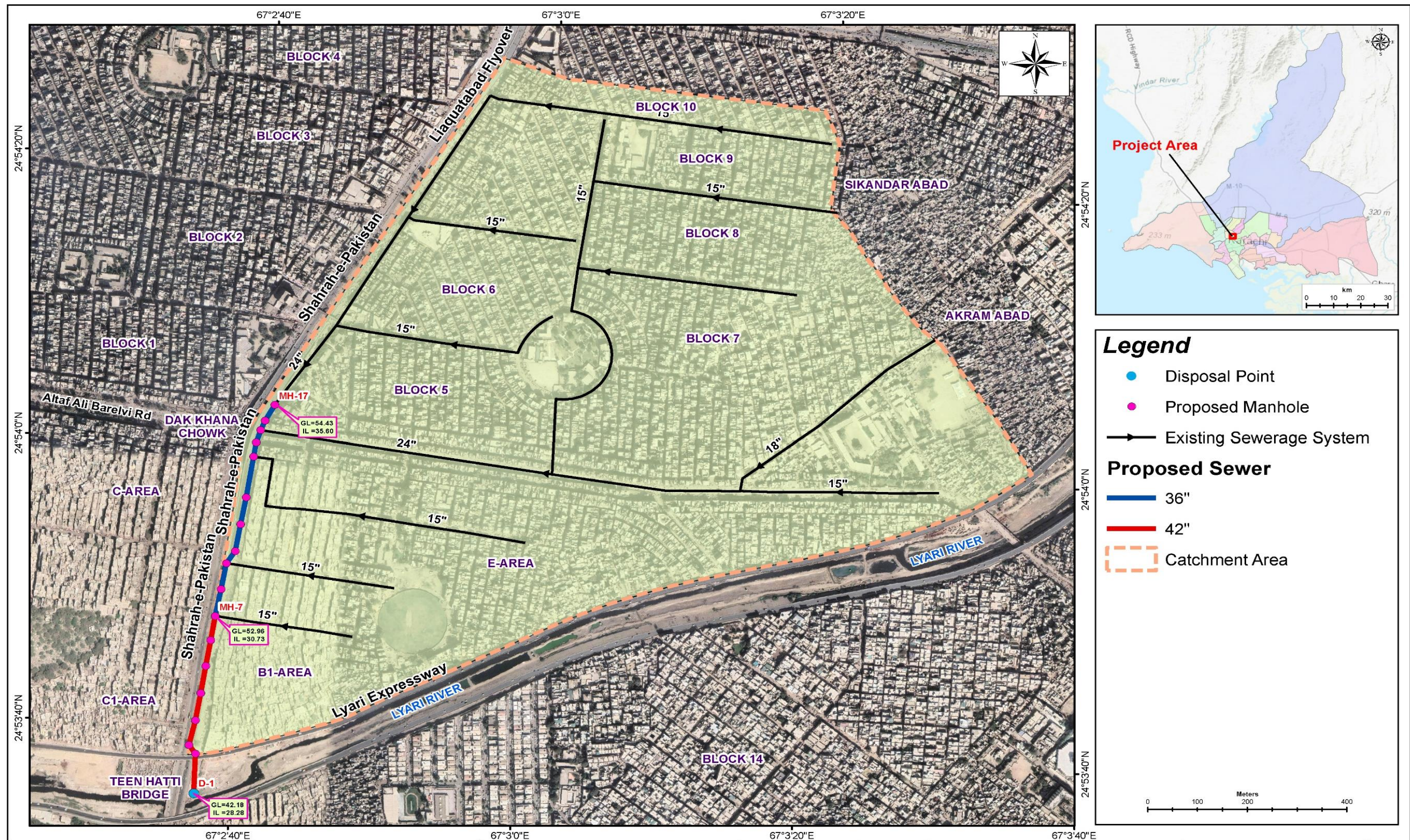
The sewer line is proposed on Shahrah-e-Pakistan/ SM Taufiq Road having a total length of 2,852ft (0.87KM). The said scheme will cater the sewage from the above-mentioned areas and will ultimately connect with Lyari interceptor leading to TP3. After approval of Feasibility Study and before starting Detailed Engineering Design (DED), the existing sewerage network and catchment was verified from concerned KW&SC official i.e., relevant town Executive Engineer. The verified catchment is shown in **Figure 3.2**.

At present a 42-inches diameter trunk sewer line exists on the opposite side of Shahrah-e-Pakistan in front of Dakh Khana which cater flows from above mentioned areas and areas C & C1. With proposed intervention, sewage load on the existing 42-inches diameter trunk sewer line will be reduced. In the proposed sewer line, existing 24-inches diameter sewer will be connected at Manhole (MH)-17 on Shahrah-e-Pakistan carrying the sewage flows from Blocks 6 and 10. Similarly, another existing 24-inches diameter sewer laid along Altaf Ali Barelvi Road will be connected with MH-15 of proposed sewer near Liaquatabad Police Station carrying sewage flows from Qasimabad and Liaquatabad Blocks 5, 7, 8 and 9. From MH-7 onwards till disposal point (Lyari Interceptor), 42-inches diameter trunk sewer is proposed to be laid parallel to the existing nullah and connected with it to cater the sewage flows from Blocks E and B1. The collected sewage will be discharged into Lyari Interceptor near Teen Hatti Bridge which will carry it to TP3 for treatment before the final disposal into the sea.

The Treatment Plant TP-3 currently has a capacity of 100 MGD, which is based on the Waste Stabilization Ponds technology. However, in order to accommodate the additional flows, TP-3 is undergoing an upgrade to increase its capacity by 80 MGD. This upgrade will be implemented using Trickling Filters technology, ensuring the effective handling of the increased flow. Following this capacity enhancement, the additional flows will be discharged in compliance with the requirements set by the Sindh Environmental Quality Standards (SEQS). Both the projects i.e., S-3 interceptor and TP-3 rehabilitation and upgradation are being undertaken by KW&SC. By the time proposed project will be in operation, the TP-3 would have been upgraded to carry and treat the added flows.

Proposed sewerage scheme in GIS format is shown in **Figure 3.4** whereas, final disposal point is shown in **Figure 3.5**.





CLIENT: PIU-KWSSIP, KW&SB 	CONSULTANT: NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE 1-C, BLOCK N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN.	DRWAN	ATHAR	PROJECT: PRIORITY SEWER NETWORK REHABILITATION UNDER ASSIGNMENT-C, COMPONENT-2, SOP-1, KWSSIP	<b>PROPOSED SEWERAGE SYSTEM (P1)</b>		SCALE
		SUBMITTED RECOMMENDED CHD./VER.	APPROVED APPROVED		DATE JULY, 2022	DRAWING NO -----	REV. -----
REV. DATE DESCRIPTION APPROVED							

Figure 3.4: GIS Layout Plan of Proposed Sewerage Scheme P1-Teen Hatti

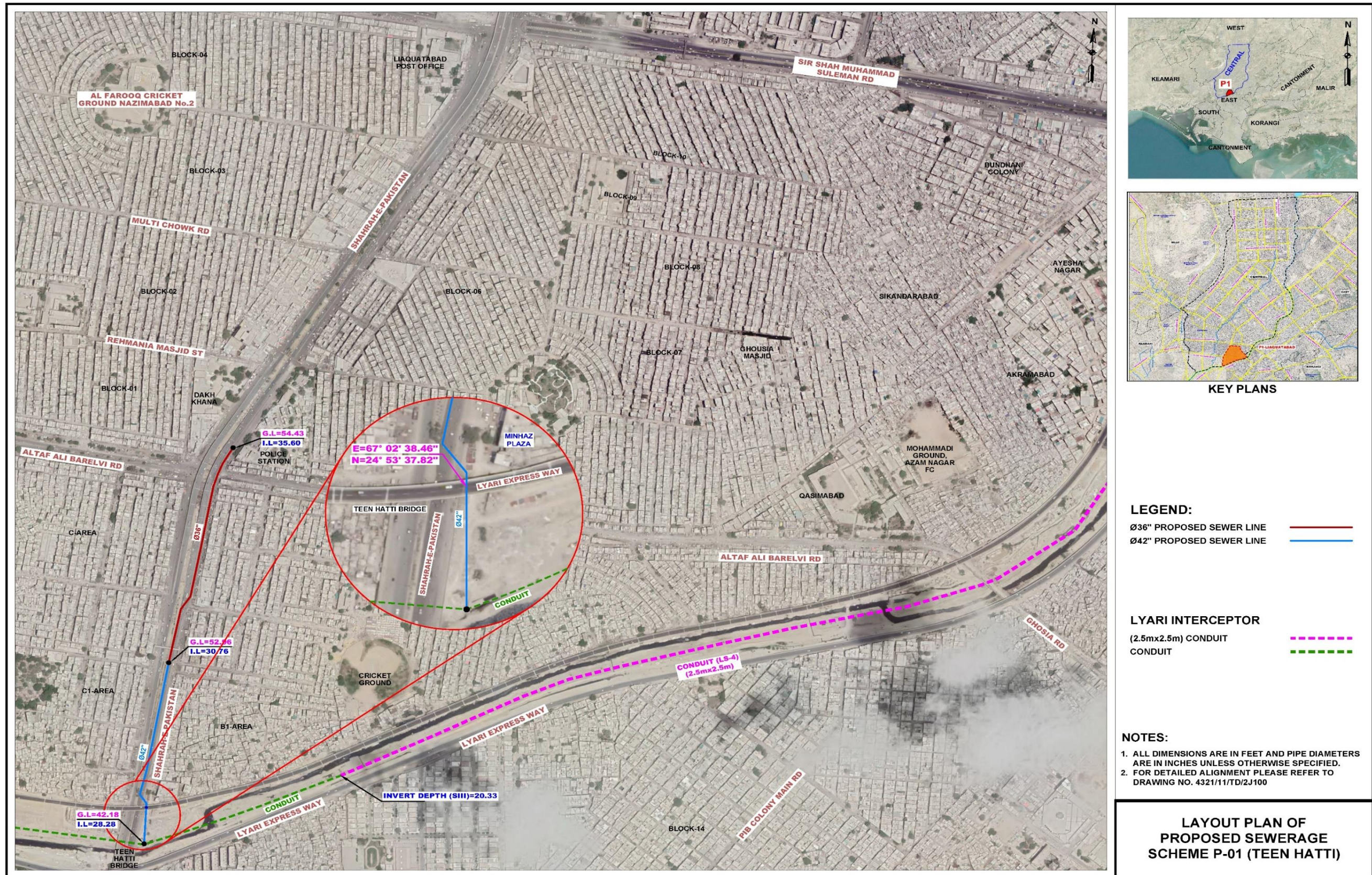


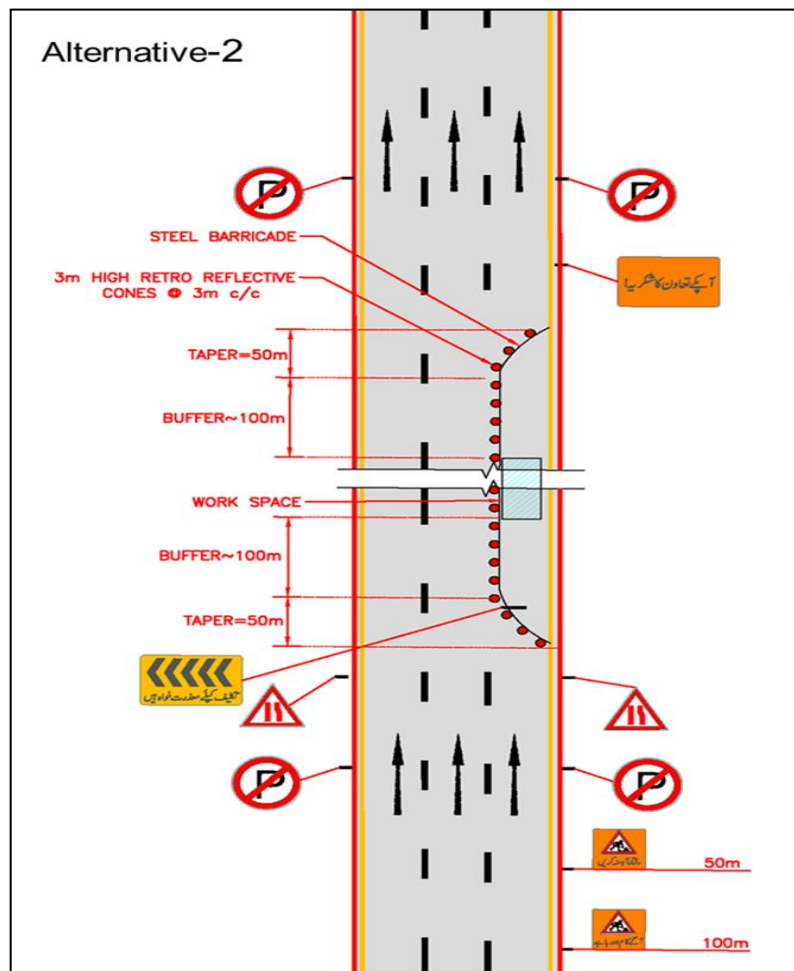
Figure 3.5: Final Disposal Point of Proposed Sewerage Scheme P1-Teen Hatti

### 3.3 Traffic Management Plan

Traffic will be adversely affected due to proposed project interventions; therefore, a traffic management plan has been devised to ensure smooth flow of traffic during execution of the project. The plan may be implemented by the Contractor so that during construction obstructions may be minimized and public hue & cry may be avoided. In this regard, different signages, hoardings and boards in native language have been prepared and proposed at adequate distances so that traffic may know beforehand about the construction activities.

#### 3.3.1 Traffic Management Plan for Sewerage Scheme P1

Typical traffic management plan for P1 is shown in **Figure 3.6** and **Figure 3.7**.



**Figure 3.6: Typical Work Plans & Traffic Management Boards for Plan**

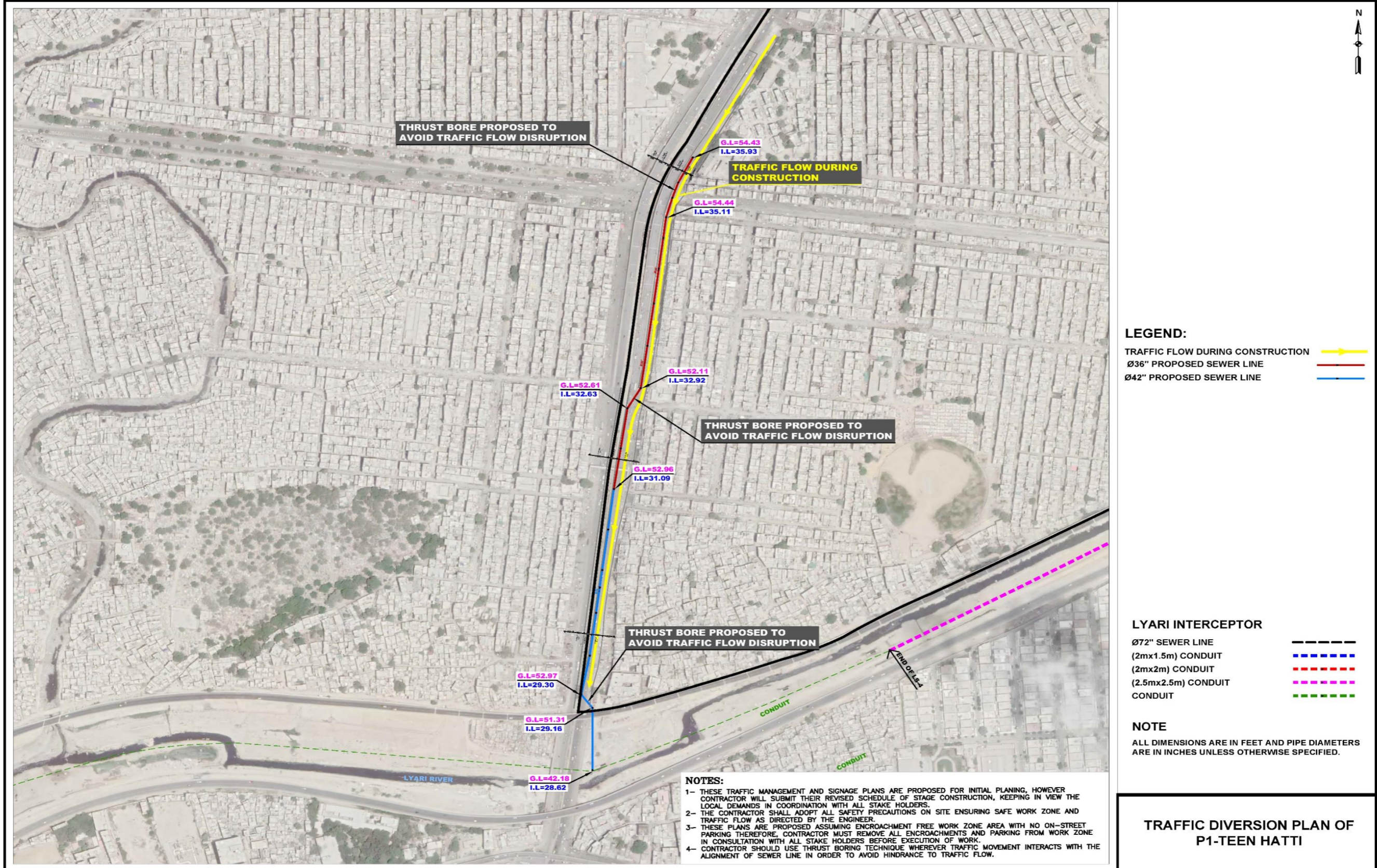


Figure 3.7:Traffic Management Plan for P1- Teen Hatti

### 3.4 Environmental & Social Considerations (E&S) in Project Design

Environmental and Social (E&S) aspects have been given due considerations in the project design to make the project sustainable, environmentally friendly and socially acceptable. E&S considerations in project design are summarized below:

- The minimum cover depth of sewer is 3 ft and the whole system has been designed on self-cleansing velocity i.e., 2.5 ft/s to keep the depth to a minimum;
- Sewers will be laid away from water supply lines (at least 1 m, wherever possible);
- Manhole covers have been designed to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/ garbage entry;
- As an anti-theft measure, large manhole covers around 3 feet in diameter have been proposed. The proposed manhole covers are heavy in weight and cannot be lifted easily, without machinery.
- Ensured sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to ensure self-cleansing velocity in order prevent built up of solids and hydrogen sulfide generation;
- All structural, layout and engineering designing are strictly in accordance with the applicable codes and engineering standard;
- Efficient seepage control measures have been considered in selection of pipe materials during the planning stage;
- Alternate sewage disposal arrangements have been suggested in design to cater the sewage flow, generated from the project area, during construction phase;

### 3.5 Project Cost

The estimated total cost for construction of proposed project is **438.45 million PKR**. This cost is tentative and will be finalized with the detailed technical design of the proposed project.

### 3.6 Land Acquisition

The proposed project does not involve any land acquisition since the project interventions include the augmentation of existing network.

### 3.7 Project Administrative Jurisdiction

The proposed project P-1 Teen Hatti, falls under the jurisdiction of Deputy Commissioner of District Central in Karachi Division.

### 3.8 Project Implementation Schedule

The project will be completed in the stipulated time of 12 months. There are several utilities along the proposed alignment including SSGPL lines, K-Electric high-tension lines, etc. Therefore, adequate time has been considered for the shifting and adjustment of the existing utilities. Furthermore, the pipes proposed in the scheme will be made through vertical casting and are not the shelf item, therefore procurement time has also been considered.

### 3.9 Construction Activities and Required Machinery

Major construction activities involve the following:

- Earth work
- Roadwork
- Pipe laying

**Table 3.1** shows the list of expected machinery required for construction. The number of these machines will be finalized with the detailed design of the proposed road:

**Table 3.1: List of expected Machinery/Equipment**

• Mobile Crane	• Pneumatic Tyred Roller (PTR)
• Wood Shuttering	• Tandem Roller
• Formwork	• Asphalt Plant
• Steel Cage Shuttering Unit	• Generators for Site and Pipe Factory (50 KVA at least)
• Dumpers	• Welding Plant
• Mini/ Hand Roller	• Transit Mixer
• Road/Power Roller	• Vibrators
• Light Weight Compactor	• Scaffolding
• Ramming Machine	• Tower Crane
• Water Sprinkler and Water Tanker	• Concrete Batching Plant
• Excavator	• Concrete Pneumatic Pump
• Tractor with Front Blade and Trolley	• Light Transport
• Loader	• Tower Light
• Road Cutter	• Barricades (Corrugated Sheets and Water Filled Barrier)
• Jack Hammer	• Dewatering Pump with Canvas Pipes
• Plate Compactor	• Configuration Hardware and Software
• Concrete Mixer Machine	
• Motor graders	
• Asphalt Paver Machine	

### 3.10 Construction Camps

The project site is a densely populated area. It will not be possible to establish the construction camp within the project boundary. Therefore, the contractor will select the camp sites keeping view its ease of operation, based on the following criteria, which will be further clarified in the C-ESMP;

- Number of workforces deployed i.e. 50;
- Type and quantity of machinery mobilized (refer Table 3.1);
- Availability of adequate area for establishing camp sites including parking areas for machinery, stores and workshops;
- Appropriate distance from sensitive areas including settlements religious areas, schools, health facilities.

Final locations will be selected by the contractor with the assistance of the Supervision Consultant and approval sought from the Chief Resident Engineer and PIU. Care will be taken to safeguard the existing environment of the area and location shall be selected away from settlements. The contractors may acquire land on lease from private landowners.

### 3.11 Earthwork and Backfilling

Total earthwork involved is 442,000 cubic feet (CFT) and total backfill quantity is 378,000 CFT. The remaining 64,000 CFT shall be disposed of in the approved dumping site by GoS, located in Jam Chakro.

Moreover, rather than completely disposing of the waste at Jam Chakro, the Contractor has the option to engage in waste-sharing with other Contractors. If a project is identified that requires excess material from the ongoing project, the Contractor will enter into a Memorandum of Understanding (MoU) with the involved party

### 3.12 Construction Materials

The materials used in construction of sewerage as per approved Feasibility Study, Reinforced Cement Concrete (RCC) sewer with High Density Poly Ethylene (HDPE)/ Poly Vinyl Chloride (PVC) liner for the diameters up to 72 inches will be provided whereas, pipe size more than 72-inches diameter will be required, RCC conduits with HDPE/ PVC will be provided. Pre-cast Reinforced Cement Concrete manholes with Unplasticized Polyvinyl Chloride (uPVC) liner will be provided. The estimated quantities to be used are given hereunder:

Sr. No.	Item Description	Unit	Quantities
1	36 " Rcc pipe	Rft	1,607.00
2	42 " Rcc pipe	Rft	1,361.00
3	Asphalt prime coat	Sft	78,300.00
4	Asphalt tack coat	Sft	78,300.00
5	Asphalt base course	Cft	18,400.00
6	Asphalt wearing Course	Cft	13,100.00
7	Base	Cft	70,500.00
8	Subbase	Cft	93,900.00

### 3.13 Workforce Requirement

Manpower required during construction would include 50 personnel while 05 persons will be required during operational phase of the project.

### 3.14 Solid Waste Generation

The project involves provision of a new sewer line which will be able to reduce the load on existing sewer. The proposed project does not involve the replacement of existing sewers completely, however, a portion of the existing sewers between only two manholes will be

replaced which will contribute to minor quantities of broken pipes and the sludge accumulated in those pipes. The total length of the existing sewer to be replaced (based on GIS data) is 94.75 meters. However, this may change depending upon the site conditions.

Furthermore, waste will also be generated at construction and contractors camp site which will include domestic waste and waste construction materials. Solid waste generated during construction and camp sites will be safely transported and disposed of in designated waste disposal site near Jam Chakro, by the Contractor. The solid waste during operation i.e., routine maintenance will be managed by the KW&SC.

### **3.15 Water Requirement**

The laying of sewerage network does not require significant quantities of water. Water requirement will be minimal which can easily be managed by the contractor through tankers. However, the water will also be required for domestic uses at the camp sites which will be approximately 250 gallons per day for 50 workers (i.e., 5 gallons per worker). Furthermore, 2-3 tankers per day will be required for dust suppression. The Contractor will arrange all the water required for the project and the workers.

### **3.16 Power Requirement**

The main source of electricity/ electric power during construction phase will be diesel generators for construction camps and construction machinery.

### **3.17 Wastewater Generation during Construction Phase**

During the replacement of existing sewerage network, the sewage from the catchment area will be disposed to the alternate manholes using flexible pipes. As the water requirement is minimal in the construction activities, the corresponding wastewater will also be negligible. However, the wastewater from the construction camps i.e., 200 gallons per day (i.e., 80% of water demand of 250 gallons per day) will be adequately disposed in the nearby drains after primary treatment i.e, septic tanks.

### **3.18 Project's Planning in view of AED**

A major Anti-Encroachment Drive (AED) was initiated in Karachi in October 2018 on the order of the Supreme Court of Pakistan. According to Project Appraisal Document (PAD) of the current study "Potential subproject sites (including proposed construction sites and associated zones of impact) located within areas already impacted by the AED on or after October 27, 2018 will not be eligible for financing under the project.

In view of encroachment issues and current AED activities in the city, a general principle has been adopted to fix the proposed alignments of sewerage and water supply schemes by avoiding resettlement/ loss of business or livelihood. The schemes where AED activities have been done in recent times, have already been removed from project's planning and scope. The AED screening report is attached as **Annex – II**.



## 4 ENVIRONMENTAL & SOCIAL BASELINE

### 4.1 General

This chapter presents the current environment in and around the proposed development which has been considered with respect to physical, ecological and socio-economic resources. An environmental baseline study is intended to establish a database against which potential project impacts can be predicted and managed later. The ESMP of the proposed project covers a comprehensive description of the project area, including the resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the construction and operation of the project.

ESMP team conducted the reconnaissance and detailed surveys of the project area for baseline data collection during field visits from October 26 to November 12, 2021; November 25 to December 7, 2021; February 28 to March 4, 2022 and April 5 to April 23, 2022. The prime objective of the field visits was to collect the baseline data on physical, eco-biological and environmental & social aspects along with identification, assessment and categorization of the significant environmental and social impacts of the proposed Project. The secondary data was collected from published sources/ reports and relevant departments, which were also verified through visual observations during reconnaissance and detailed surveys.

### 4.2 Purpose of the Baseline Study

An environmental and social baseline study is intended to identify and establish all the physical, ecological and social conditions, prevailing earlier the execution of the project, to use this information as a reference datum to associate future changes and judge them if the conditions have changed for better or worse.

### 4.3 Delineation of Study Area/ Corridor of Impact (Col)

As per the environmental screening study conducted earlier, the project falls in “category B” which means that the impacts of the project activities are limited, local and reversible. Therefore, Col has been considered as 200 m. All the environmental and social sensitive features were identified during the field visits within the Col. The Col map of proposed project area is given in **Figure 4.1**.

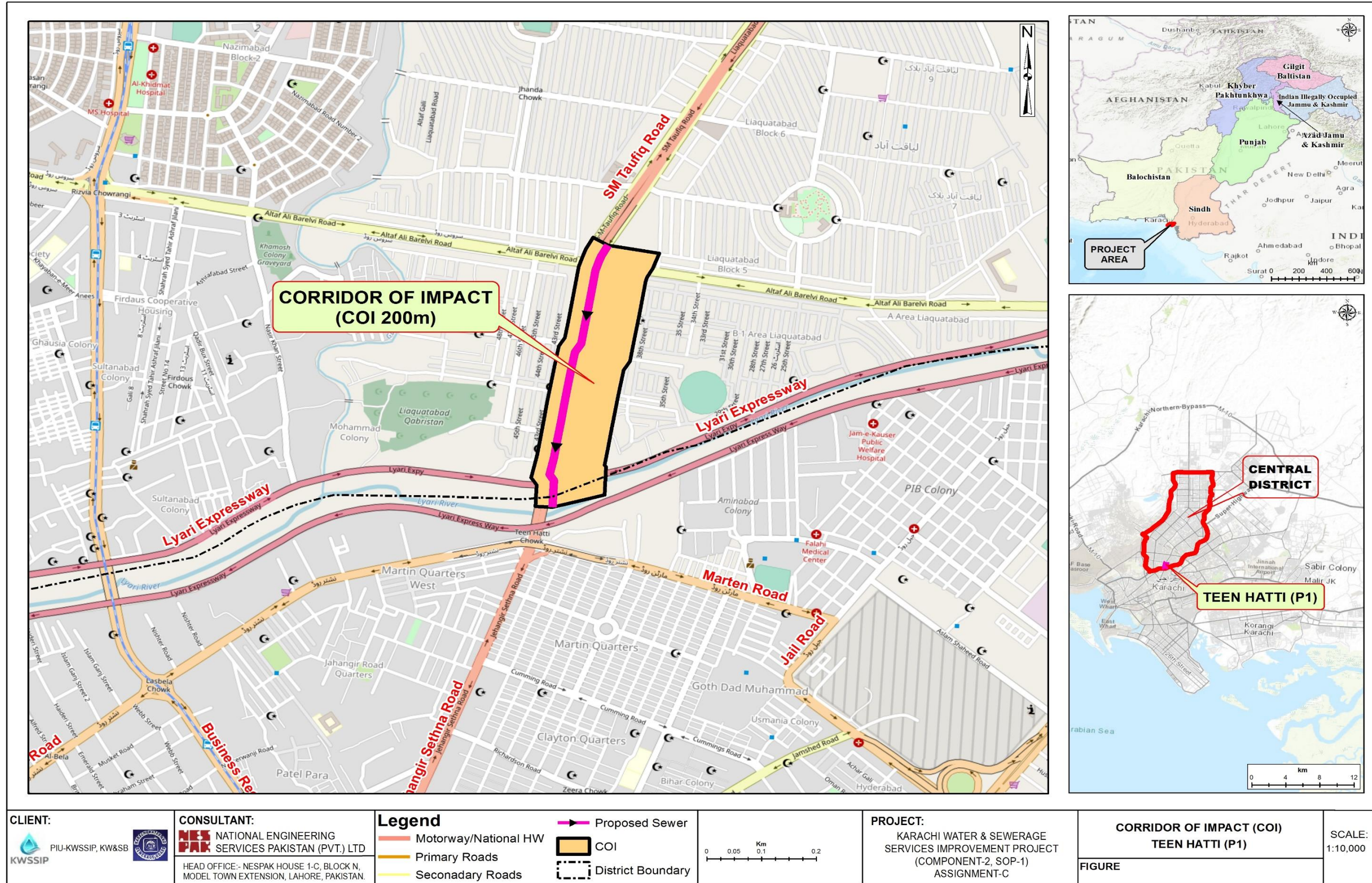


Figure 4. 1: Study Area Map / Col of Teen Hatti (P1)

As per the national and provincial regulations along with the requirements of World Bank's OP's, impacts and risks have been analyzed within the project Col. The Col does not include potential impacts that might occur without the project or independently of the project. Environmental and social impacts and risks will also be analyzed for all relevant stages of the project cycle, including pre-construction, construction and operation phases of the project.

#### **4.4 Physical Environment**

The physical environment includes topography, regional geology, soils, climate, hydrology, drainage, seismology, surface water, groundwater, ambient air quality, noise monitoring and sensitive receptors etc.

##### **4.4.1 Topography**

According to the findings of Topographic survey report ground levels in Teen Hatti (P1) project site lies between 42-54 ft above sea level (A.S.L).<sup>8</sup> Contour map of Teen Hatti is shown in **Figure 4.2**.

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<sup>8</sup> District census report of Karachi West 1998

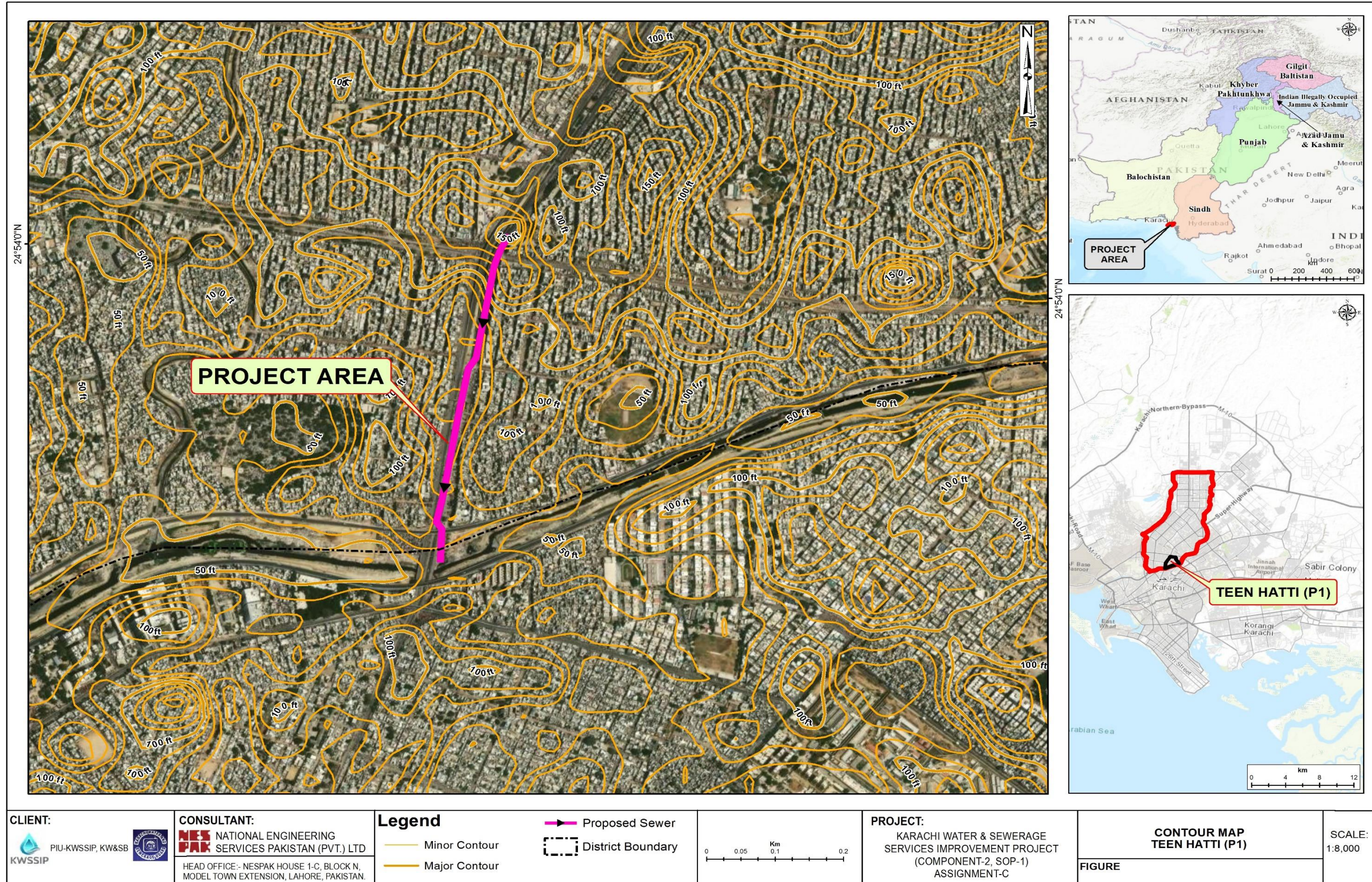


Figure 4.2: Contour Map of Teen Hatti (P1)

#### 4.4.2 Soil & Geology

Geotechnical investigations at the project site reveal that on-site soil mostly comprise Silty Sand and Silty Sand with Gravels. However, at various depths, Well Graded Sand with Silt, Poorly Graded Sand with Silt in loose to very dense state and Lean Clay, Lean Clay with Sand were also present in stiff to hard state, up to maximum investigated depth of 12 m below natural surface level (NSL). Groundwater was not encountered in any of the boreholes of sewerage scheme P1 Liaquatabad up to maximum investigated depth of 12.0 m below NSL during field geotechnical investigations executed in the month of April/May, 2022.

#### 4.4.3 Climate and Meteorology

##### A. Urban Flooding

Urban flooding in Karachi has been a recurring problem for many years, especially during the monsoon season. The city has a poorly designed drainage system and lacks adequate infrastructure to cope with high intensity rainfalls.

The situation is further exacerbated by encroachments on natural drainage channels, a lack of proper waste management, and the dumping of garbage in stormwater drains. In recent years (July 2019, August 2020, monsoon of 2022), the situation has been worsened by climate change, which has led to more frequent and intense rainfall events. The intensities of rainfall in Karachi with different return periods are given hereunder:

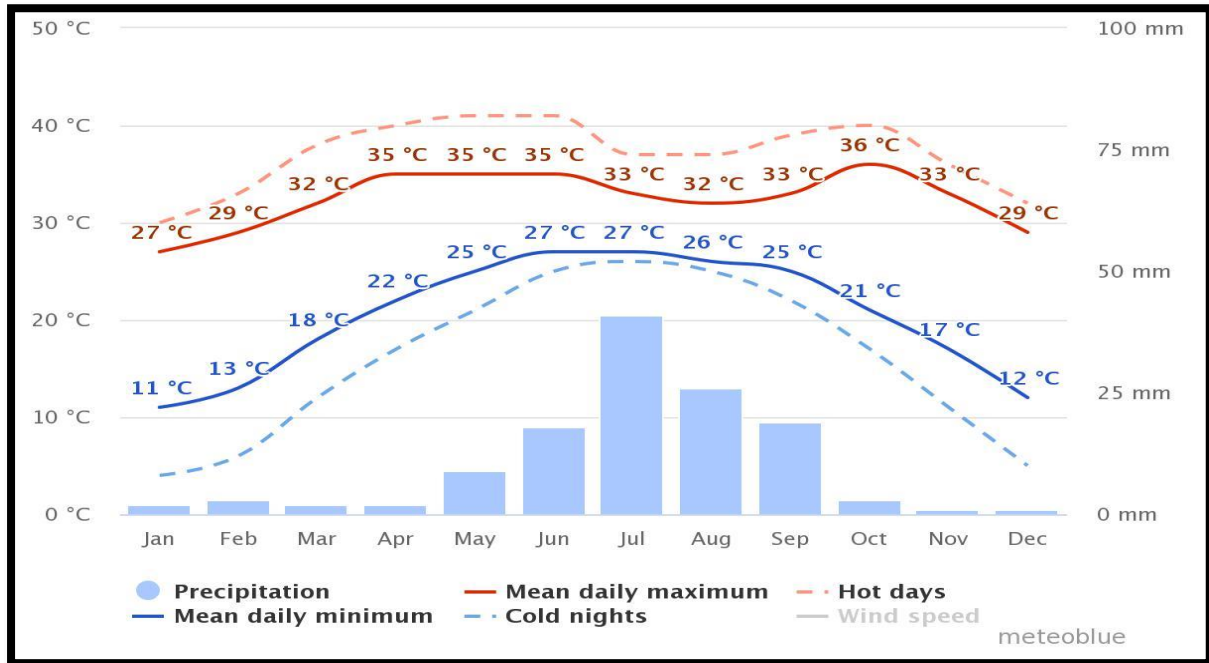
Return period	Depth of rain in 24-hr (mm)
2.33-year	88
5-year	134
10-year	173
25-year	221
50-year	258
100-year	293

The urban flooding also affects the project area. As already indicated in Section 3 that Lyari River is located at the downstream of the proposed alignment. The stormwater from the project areas drains out towards the river. Being very close to the river and due to absence of dedicated stormwater drainage system, the project area receives water from the upstream catchment area and gets inundated for short periods. It also causes temporary business losses due to restriction in access for the shopkeepers along the existing road, disturbs routine activities, causes health & hygiene related issues and roadside accidents. Urban flooding also increases the vulnerability for women, elderly, and differently able persons and children as it impacts their health, livelihood and mobility.

##### B. Average Temperatures

**Figure 4.3** represents mean monthly maximum and minimum temperatures for different months of the last 30 years. The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Karachi. Likewise, "mean daily minimum"

(solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.<sup>9</sup>

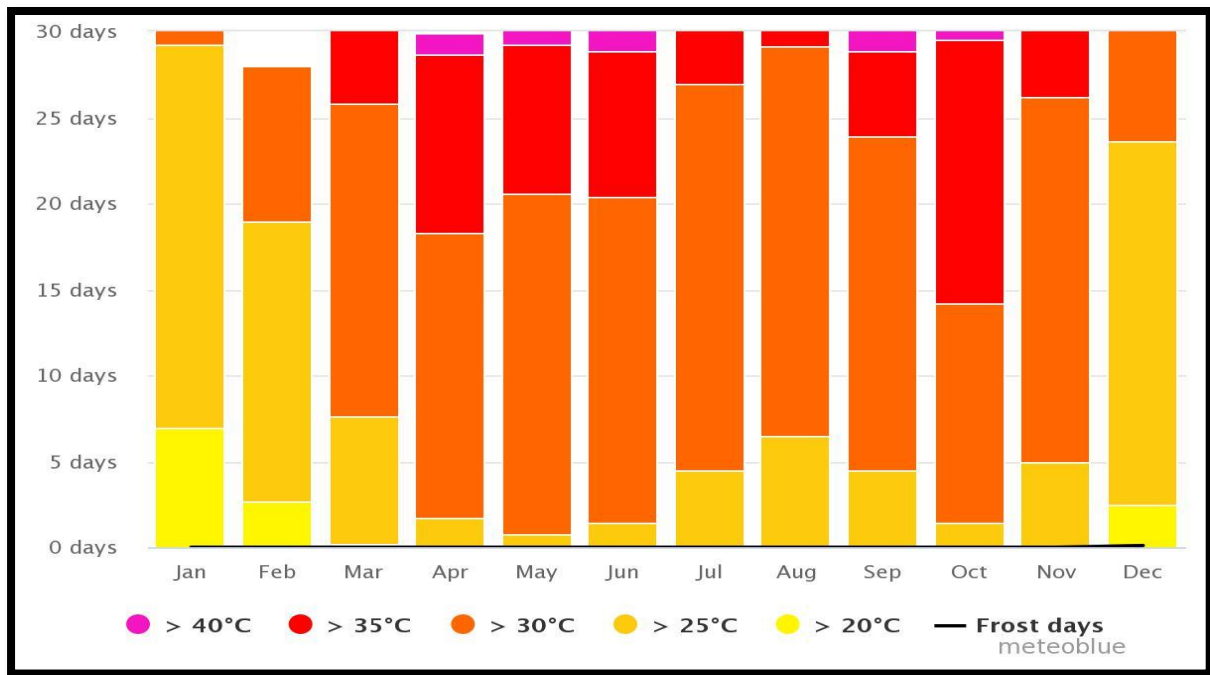


**Figure 4.3: Average Temperatures & Precipitation**

The project area has a moderate extreme climate. It has hot summers and mild winters. The summer starts in May and lasts till September. May and June are the hottest months. The mean maximum temperature is observed 35 °C for the month of May as shown in **Figure 4.3**. The winter season lasts from November to February. January is the coldest month. The mean maximum and mean minimum temperature ranges from 27 °C to 12 °C in January. The maximum temperatures are presented in **Figure 4.4**.

The construction activities in the scorching heat may affect the workers’ health. It may cause heat strokes etc. The impact has been considered and the mitigations have been provided including scheduling of labors, provision of tents/ shades and provision of cold drinking water.

<sup>9</sup> [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/karachi\\_pakistan\\_1174872](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/karachi_pakistan_1174872)



**Figure 4.4: Maximum Temperatures**

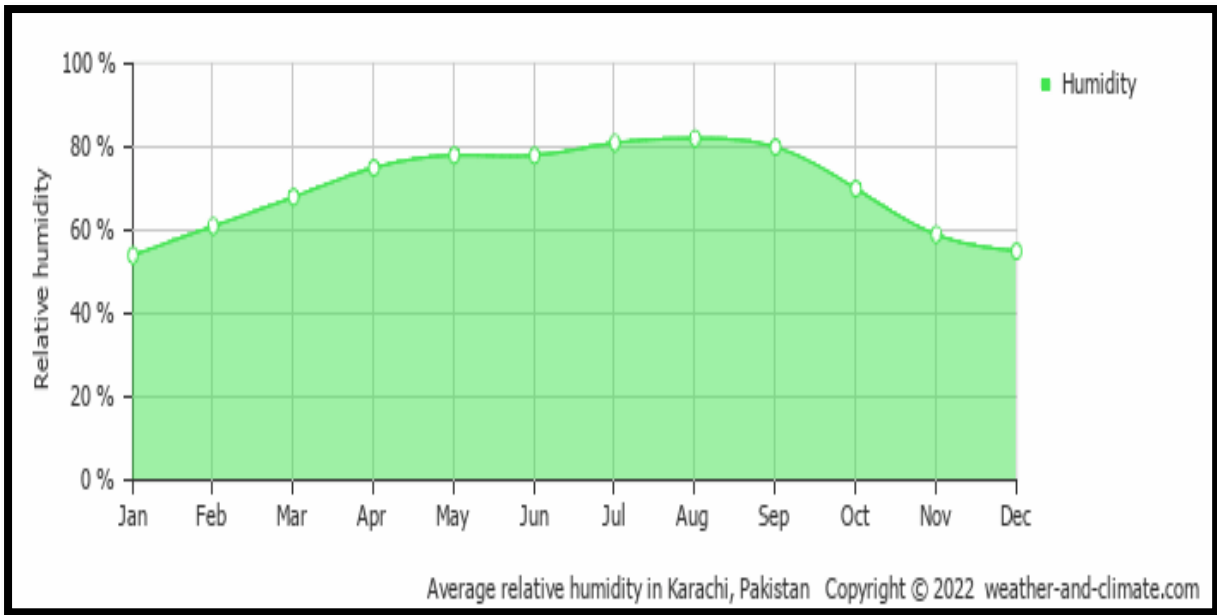
### C. Humidity

The graph below represents the Average relative humidity over the year. **Figure 4.5** shows the Average relative humidity of Karachi.

- On average, August is with 82.0% the most humid.
- On average, January is with 54.0% the least humid month.
- The average annual percentage of humidity is: 70%<sup>10</sup>

The relative humidity is at its peak in the month of May to September. These humid months are the toughest for the human activities as it causes severe dehydration. The worker will be provided with cold drinking water to stay hydrated in these months.

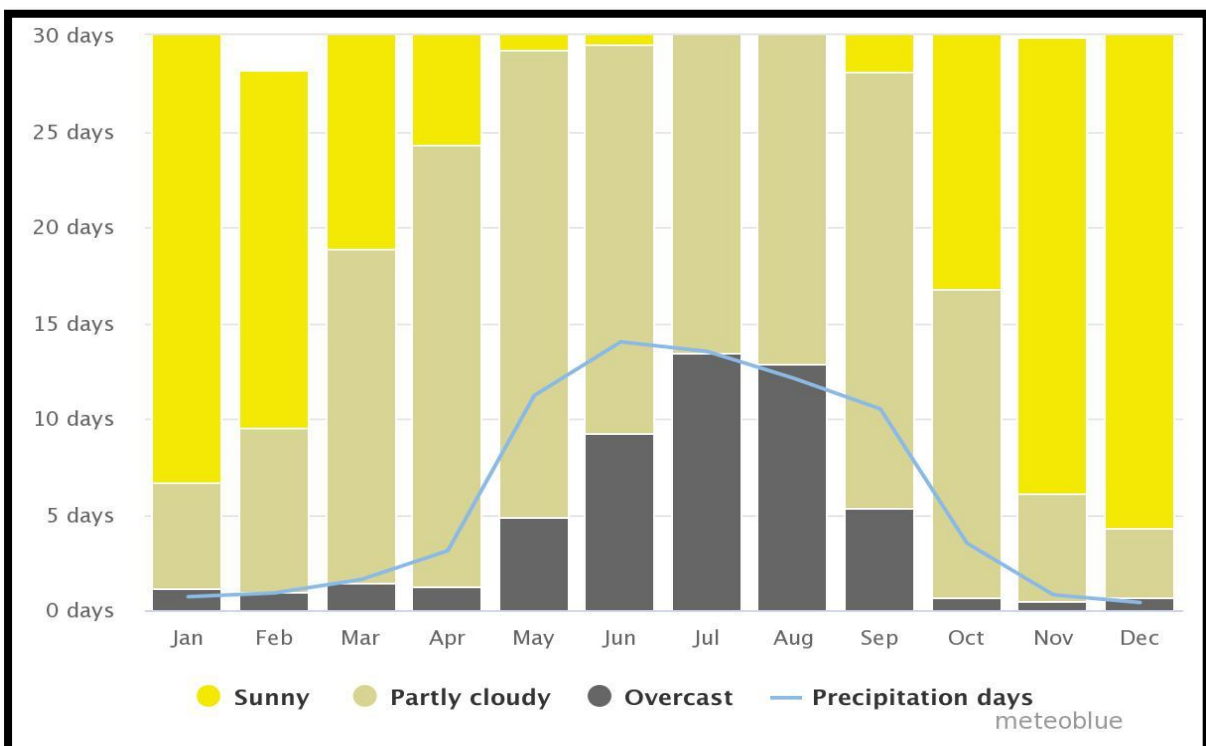
<sup>10</sup> (2022, August 23). *Simulated historical climate & weather data for Karachi*. Meteoblue. Retrieved August 25, 2022, from <https://weather-and-climate.com/average-monthly-Humidity-perc,Karachi,Pakistan>



**Figure 4.5: Shows Average Relative Humidity**

**D. Rainfall**

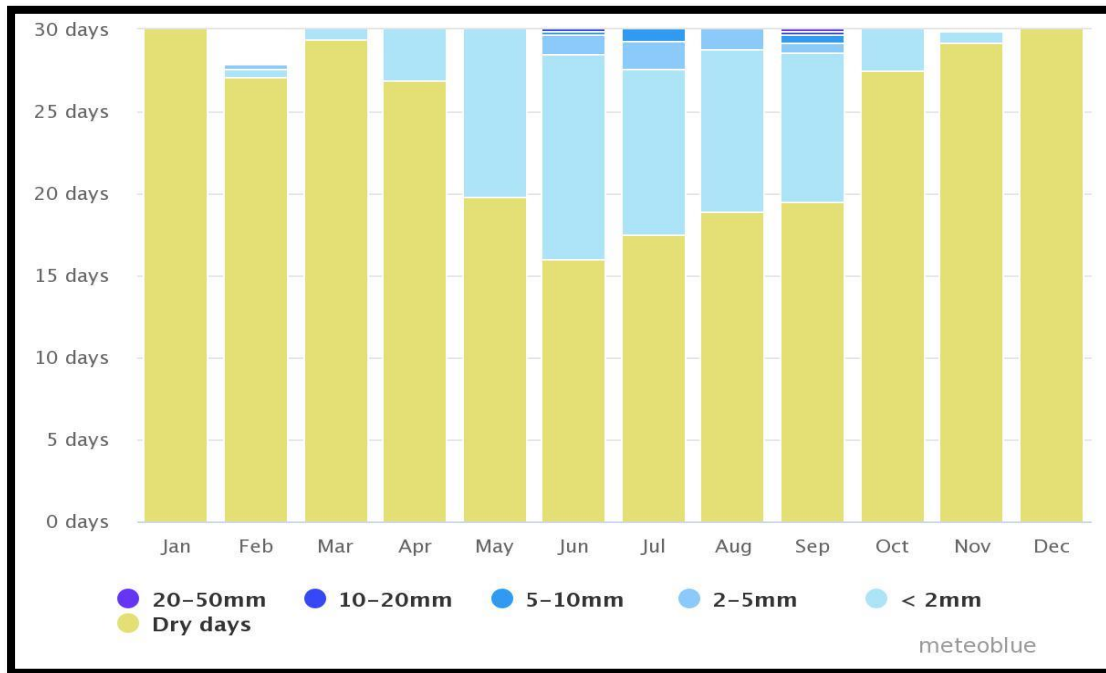
The meteorological station at Karachi Airport collects climatic data. Rainfall near the Karachi coast is extremely low and erratic and this region falls in the semi-arid climatic zone. Maximum precipitation was observed in the month of July nearly 50mm. Precipitation system continues from May to September as Shown in **Figure 4.6**.



**Figure 4.6: Cloudy, Sunny and Precipitation Days**



**Figure 4.7** shows how many days per month, certain precipitation amounts are reached. It can be seen from the chart that the precipitation in July to September is maximum and ranges between 2-5 mm. Highest intensity of precipitation is observed in the month of July as Shown in **Figure 4.7**

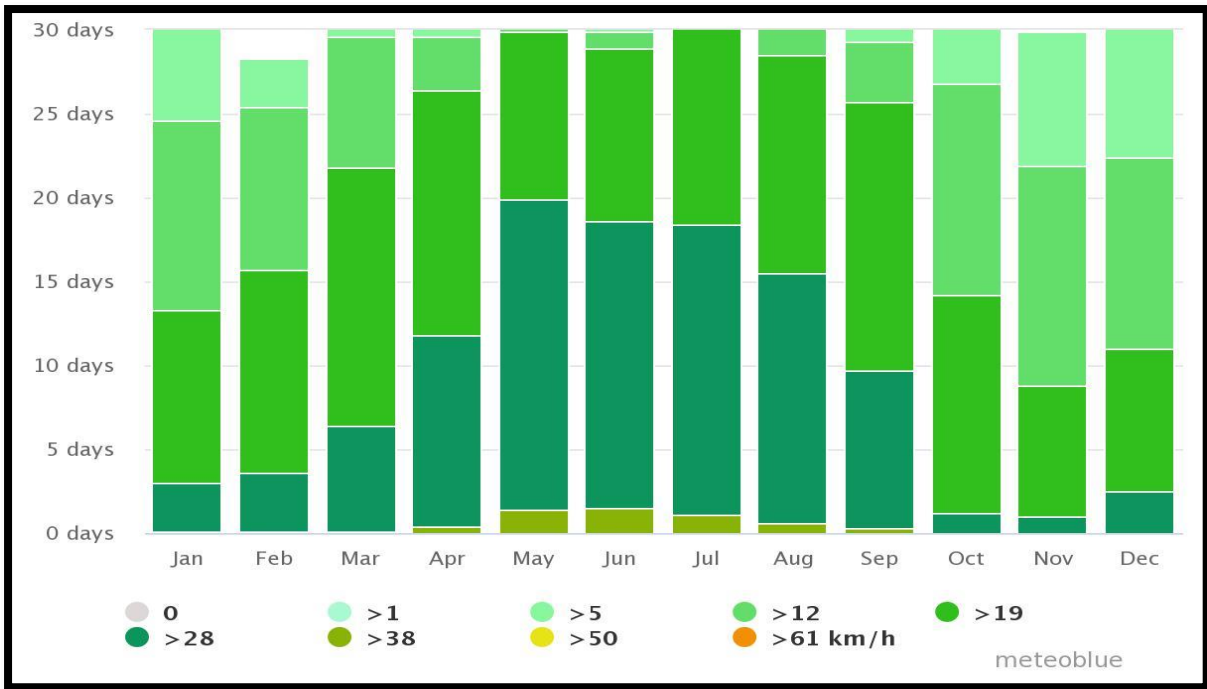


**Figure 4.7: Precipitation Amounts**

The rainfall may have a severe impact on the construction activities including that of urban flooding. The situation may exacerbate when the trenches are dug for laying of sewerage network. Therefore, no excavation works will be carried out in these months, if necessary, all the excavated trenches will be immediately backfilled after laying sewer.

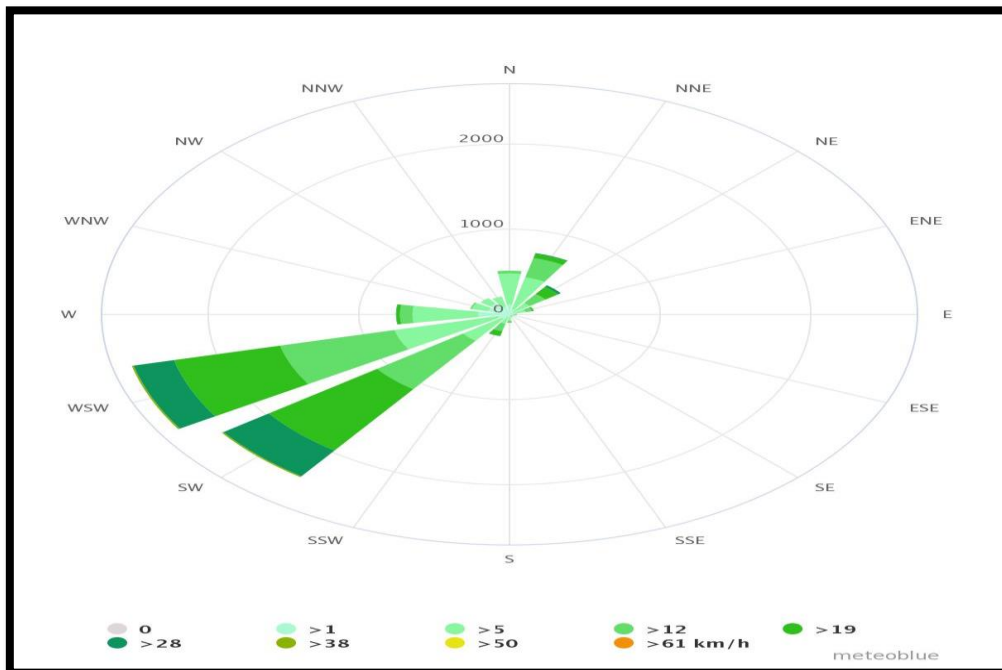
### **E. Wind Speed and Direction**

Central Karachi weather is considered pleasant and is famous for its breeze from the sea. The onshore winds from the Arabian Sea contribute to humid conditions. The wind speed has highest velocities during the summer months, when the direction is south-west to west. During winter, the wind blows from north to northeast, shifting southwest to west in the evening hours. **Figure 4.8** shows the days per month, during which the wind reaches a certain speed.



**Figure 4.8: Wind Speed**

The wind rose for Karachi for the last 30 years shows how many hours per year the wind blows from the indicated direction. Wind rose is shown in **Figure 4.9**.



**Figure 4.9: Wind Rose for Karachi**

It can be seen from the wind rose that the dominant wind direction is from **WSW**.

The wind speed and direction are important as the project activities mostly include excavation. The loose soil may spread due to wind speed in the prevalent wind direction resulting in loss of soil at the project site and deposition of soil/ mud at various places. Furthermore, the gases trapped in the buried pipes may also spread around due to wind. Therefore, the excavation works will be avoided in windy days, if necessary, all the excavated material will be covered with tarpaulin.

## F. Climate Change Effects

Karachi city is affected by two types of climate change impacts i.e., flooding due to torrential rains and heat wave<sup>11</sup>. The Climate of Karachi is semi-arid and rainfall is low and highly variable. Despite being a relatively dry city, Karachi faces rainfall during the monsoon season and is vulnerable to recurrent urban flooding. Torrential rains and heavy rainfall mostly occur in the month of June under the effect of tropical storms. Climate change-related risks that are anticipated include flooding due to precipitation and heat waves. As a result of a tropical storm (6 June 2010) Karachi received 130 mm rain within a day which caused huge surface runoff. This trend has now continued and Karachi is receiving heavy precipitation each year. In July 2022, the megacity was hit by heavy monsoon rain which caused urban flooding.

The city is exposed to extreme temperature events, with deadly heat waves recently recorded in 2015, 2017 and 2018. In Karachi the cause of heat wave is mainly due to atmospheric condition and urban heat island effect<sup>12</sup>.

### 4.4.4 Water Resources

Project site of Teen Hatti lies in Central District. The project site is located near the Lyari River. Gujjar Nullah and Orangi stream are located in North western side of project, whereas Malir River is located on South Eastern side of project. **Figure 4.10** shows hydrology of the Teen Hatti. All of these streams have converted into sewerage drains since long, besides acting as the storm water drains for surface runoff. The water flowing in these is not usable for any purpose in the current state. However, the flow could contribute in the recharge of groundwater in the project area. The project is not expected to tinker with the Lyari river flows and quality.

<sup>11</sup> The World Meteorological Organization (WMO) defines heat-wave as "when the daily maximum temperature of more than five consecutive days exceeds the average maximum temperature by 5 °C, from the normal temperature of an area.

<sup>12</sup> (June 2015). Government of Pakistan, Ministry of Climate Change, Technical Report on Karachi Heat Wave.

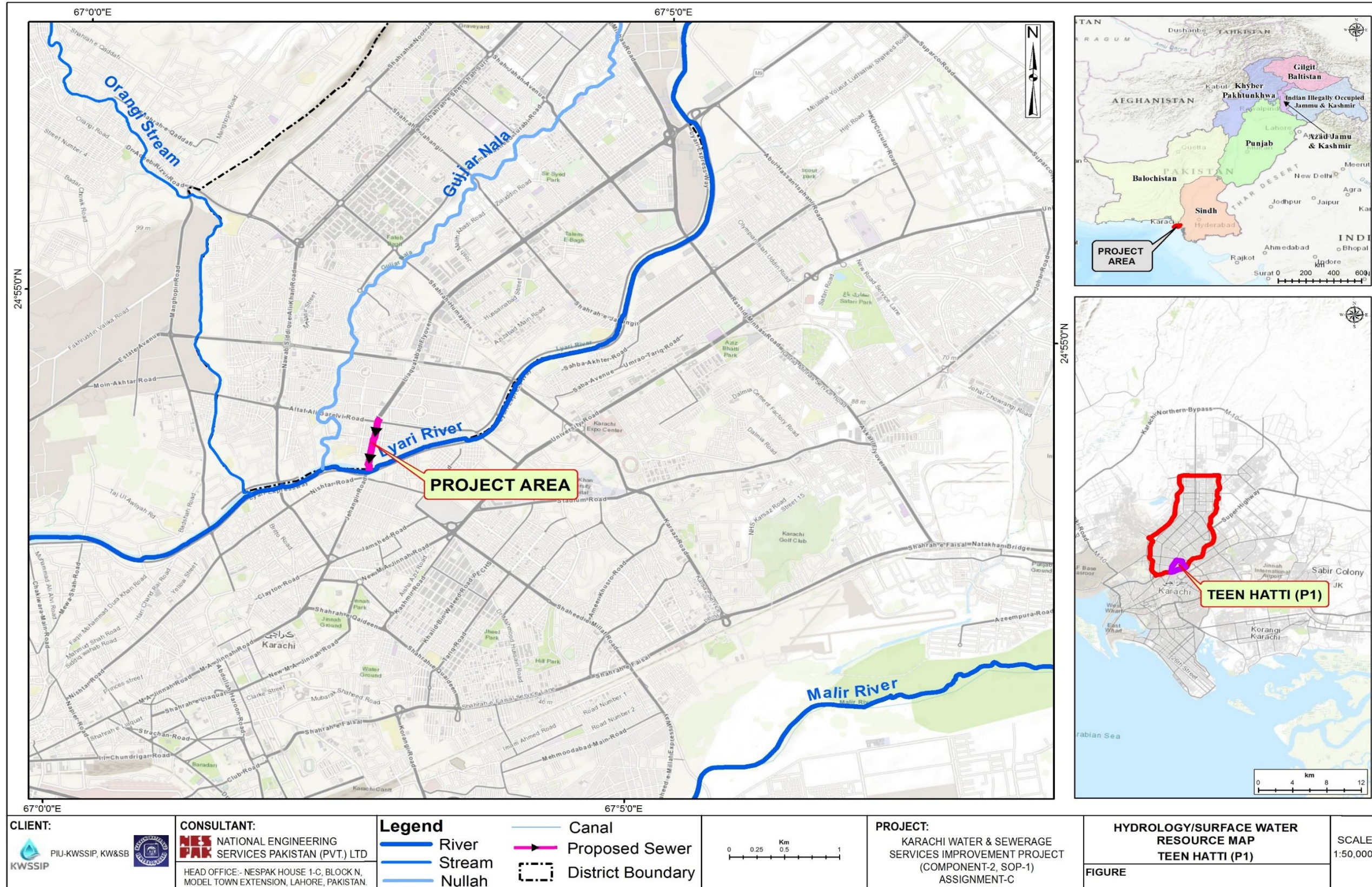


Figure 4.10: Hydrology Map of Teen Hatti (P1)

#### 4.5.2 Environmental Monitoring, Sampling and Testing for Proposed Project

To determine the ambient air, noise levels, groundwater/ drinking water and wastewater quality of the study area, two (02) samples of each parameter were collected from project area. The sampling locations for the environmental monitoring of ambient air, noise and groundwater/ drinking water and wastewater for Teen Hatti are shown in **Figure 4.11**.

The task of environmental monitoring and testing was been awarded to SEPA approved environmental laboratory i.e., M/s HSE Services. The work was awarded as per Public Procurement Regulatory Authority (PPRA) regulations through a competitive bidding.

#### A. Ambient Air Quality

The ambient air quality was tested for the priority pollutants such as NO, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and Total Suspended Particles (TSP). The monitoring period was 24 hours. The results of ambient air quality and noise monitoring are given in **Table 4.1** and Lab reports are attached as **Annex-III**.

**Table 4.1: Ambient Air Quality Results**

Sr. No.	Parameters	Avg. sampling time	Unit	Location		SEQS
				P-1		
1	Carbon monoxide	24 hrs.	mg/m <sup>3</sup> (8 Hour)	4.63	4.6	5
2	Nitrogen Dioxide		µg/m <sup>3</sup>	35.6	25.57	40
3	Nitric oxide		µg/m <sup>3</sup>	53.08	52.49	80
4	Oxides of Nitrogen (NOx)		µg/m <sup>3</sup>	88.76	78.06	120
5	Sulphur dioxide		µg/m <sup>3</sup>	44.69	42.63	120
6	Ozone		µg/m <sup>3</sup>	12.54	12.43	130
7	PM <sub>(2.5)</sub>		µg/m <sup>3</sup>	<b>53.45</b>	<b>45.12</b>	35
8	PM <sub>(10)</sub>		µg/m <sup>3</sup>	96.58	78.91	150
9	Suspended particulate Matter (SPM)		µg/m <sup>3</sup>	484.25	286.79	500
10	Lead		µg/m <sup>3</sup>	BDL*	BDL*	1.5
<b>Noise</b>						
1	Day time		dB(A)	72.6	67.3	65
2	Night time		dB(A)	74.8	73.66	55

The values of PM<sub>2.5</sub> were observed to be high at all monitoring locations. The possible reason behind the higher values is the vehicular movement at the main roads. Noise levels were observed to be high at all the sampling points, which may be due to the movement of vehicles on main roads, commercial activities and routine hustle bustle in the city.

## B. Groundwater/ Drinking Water Quality

Groundwater being saline, is not used in for drinking purposes in the project area. It is only used for washing and in the toilets etc. The project area gets water supply from the bulk supply lines of the city. Samples were taken from KW&SC supplied water through taps. The water samples were collected from Teen Hatti in June 18, 2022 by HSE Laboratory and were analyzed for chemical and microbiological parameters. The results of groundwater samples were compared with SEQs. The results of Groundwater/Tap water are given in **Table 4.2** and Lab reports are attached as **Annex-III**.

**Table 4.2: Results of Groundwater/ Tap water**

Sr. No	Measuring Parameter	Units	SEQS Limits	P-1	
				Sample#1	Sample#2
1	pH @ 25 °C	pH	6.5-8.5	7.01	7.24
2	Color	TCU	<15TCU	<5	<5
3	Turbidity	NTU	<5	<5	<5
4	Total Hardness as CaCO <sub>3</sub>	(mg/L)	<500	257.09	269.38
5	Total Dissolved Solids (TDS)	(mg/L)	<1000	674	689
6	Aluminum	(mg/L)	0.2	ND	ND
7	Antimony	(mg/L)	<0.005	ND	ND
8	Barium	(mg/L)	0.7	ND	ND
9	Boron	(mg/L)	0.3	<0.1	<0.1
10	Cadmium	(mg/L)	0.01	ND	ND
11	Chloride	(mg/L)	<250	<b>285.94</b>	<b>278.68</b>
12	Chromium	(mg/L)	<0.05	ND	ND
13	Copper	(mg/L)	2.0	ND	ND
14	Cyanide	(mg/L)	0.05	ND	ND
15	Fluoride	(mg/L)	1.5	0.51	0.49
16	Lead	(mg/L)	<0.05	ND	ND
17	Manganese	(mg/L)	0.5	ND	ND
18	Mercury	(mg/L)	<0.001	ND	ND
19	Nickel	(mg/L)	<0.02	BDL	ND
20	Nitrate	(mg/L)	0.5	BDL	BDL
21	Nitrite	(mg/L)	3	BDL	BDL
22	Selenium	(mg/L)	0.01	<0.1	BDL
23	Residual Chlorine	(mg/L)	0.2-0.5	ND	<0.1
24	Taste	.....	Non Objectionable/ Acceptable	ND	ND

Sr. No	Measuring Parameter	Units	SEQS Limits	P-1	
				Sample#1	Sample#2
25	Odor	.....	Non Objectionable/ Acceptable	ND	ND
26	Arsenic	(mg/L)	0.05	ND	ND
27	Zinc	(mg/L)	<5	0.04	0.05
28	Pesticides	mg/L	0.15	ND	ND
29	Phenolic compound	(mg/L)	0.002	BDL	BDL
30	Total Coliform	(count/100ml)	0/100ml	ND	ND
31	Fecal Coliform	(count/100ml)	0/100ml	ND	ND
32	Escherichia Coli	(count/100ml)	0/100ml	ND	ND

The value of chlorides was observed to be high in all the samples which indicates the high salinity of water.

### C. Wastewater Quality

Wastewater samples were collected from Teen Hatti in June 18, 2022 by HSE Laboratory and was analyzed for its parameters. The results of wastewater samples were compared with SEQs. The results are given in **Table 4.3** and Lab reports are attached as **Annex-III**.

**Table 4.3: Results of Wastewater**

Sr. No.	Measuring Parameter	Units	SEQS Limits	P-1	
				Near Jamal Homes Clinic, Near Shanza Liaquatabad)	C-1 Area, Drain Teen Hatti Bridge, Liaquatabad
1	Temperature	°C	40 + ≤ 03 °C	30	30
2	pH @ 25 °C	pH	6 to 9	7.45	7.35
3	Total Dissolved Solids	(mg/L)	3500	1628	1806
4	Chemical Oxygen Demand	(mg/L)	150	<b>372</b>	<b>370</b>
5	Biological Oxygen Demand	(mg/L)	80	<b>120</b>	<b>119</b>
6	Total Suspended Solids	(mg/L)	200	83	76
7	Chloride	(mg/L)	1000	791.13	682.94
8	Fluoride	(mg/L)	10	1.52	1.54
9	Oil & Grease	(mg/L)	10	10	<b>20</b>
10	Phenolic compound	(mg/L)	0.1	BDL	BDL
11	Cyanide	(mg/L)	1.0	ND	ND
12	Anionic Detergent	(mg/L)	20	0.70	0.81
13	Sulfate	(mg/L)	600	123	111
14	Sulfide	(mg/L)	1.0	<0.04	<0.04
15	Ammonia	(mg/L)	40	0.86	0.67

Sr. No.	Measuring Parameter	Units	SEQS Limits	P-1	
				Near Jamal Homes Clinic, Near Shanza Liaquatabad)	C-1 Area, Drain Teen Hatti Bridge, Liaquatabad
16	Cadmium	(mg/L)	0.1	ND	ND
17	Chromium	(mg/L)	1.0	0.12	0.04
18	Copper	(mg/L)	1.0	0.23	0.24
19	Lead	(mg/L)	0.5	<0.1	0.01
20	Nickel	(mg/L)	1.0	ND	ND
21	Zinc	(mg/L)	5.0	0.19	0.18
22	Total Iron	(mg/L)	8.0	0.12	0.11
23	Manganese	(mg/L)	1.5	0.05	0.05
24	Selenium	(mg/L)	0.5	BDL	BDL
25	Silver	(mg/L)	1.0	ND	ND
26	Arsenic	(mg/L)	1.0	<0.01	<0.01
27	Barium	(mg/L)	1.5	0.14	0.15
28	Boron	(mg/L)	6.0	<0.1	<0.1

The values of BOD and COD were observed to be higher than the discharge standards which is due to the reason that presently no wastewater treatment is being carried out before disposal of wastewater into Lyari River.



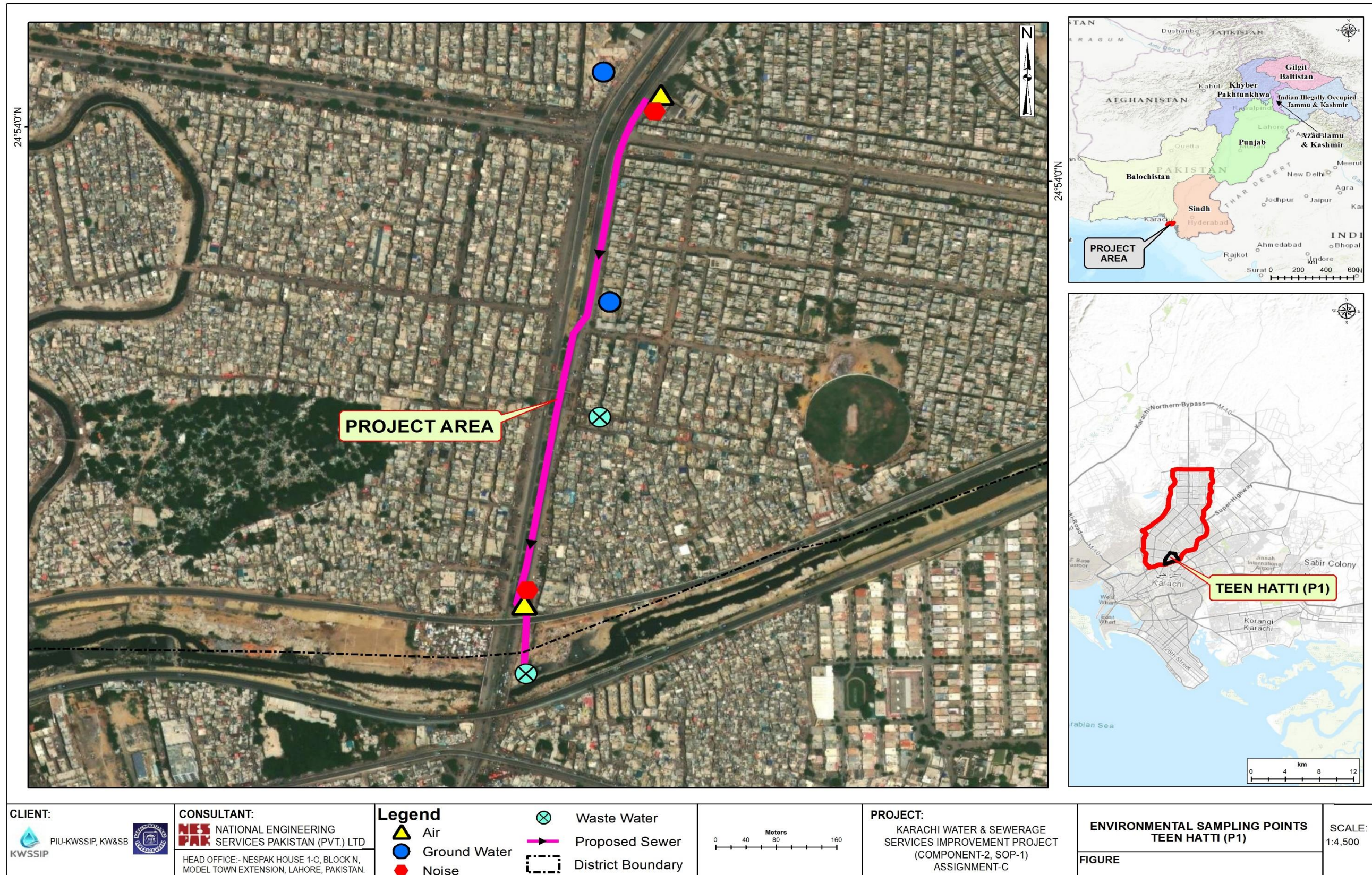


Figure 4.11: Environmental Sampling Points Location at Teen Hatti (P1)

#### 4.4.5 Seismology

The seismic zoning for Karachi was revised after the 2005 earthquake. Probabilistic Seismic Hazard Assessment (PSHA) carried out for revision of seismic provisions of the Building Code of Pakistan shows that central Karachi falls in Zone 2B. The Zone 2B has Peak Ground Acceleration (PGA) in the range of 0.16 g to 0.24 g for a return period of 475 years and is considered to be at 'Moderate' risk of a major earthquake event.

The seismic zoning on the basis of Peak Ground Acceleration (PGA) is summarized in **Table 4.4**.

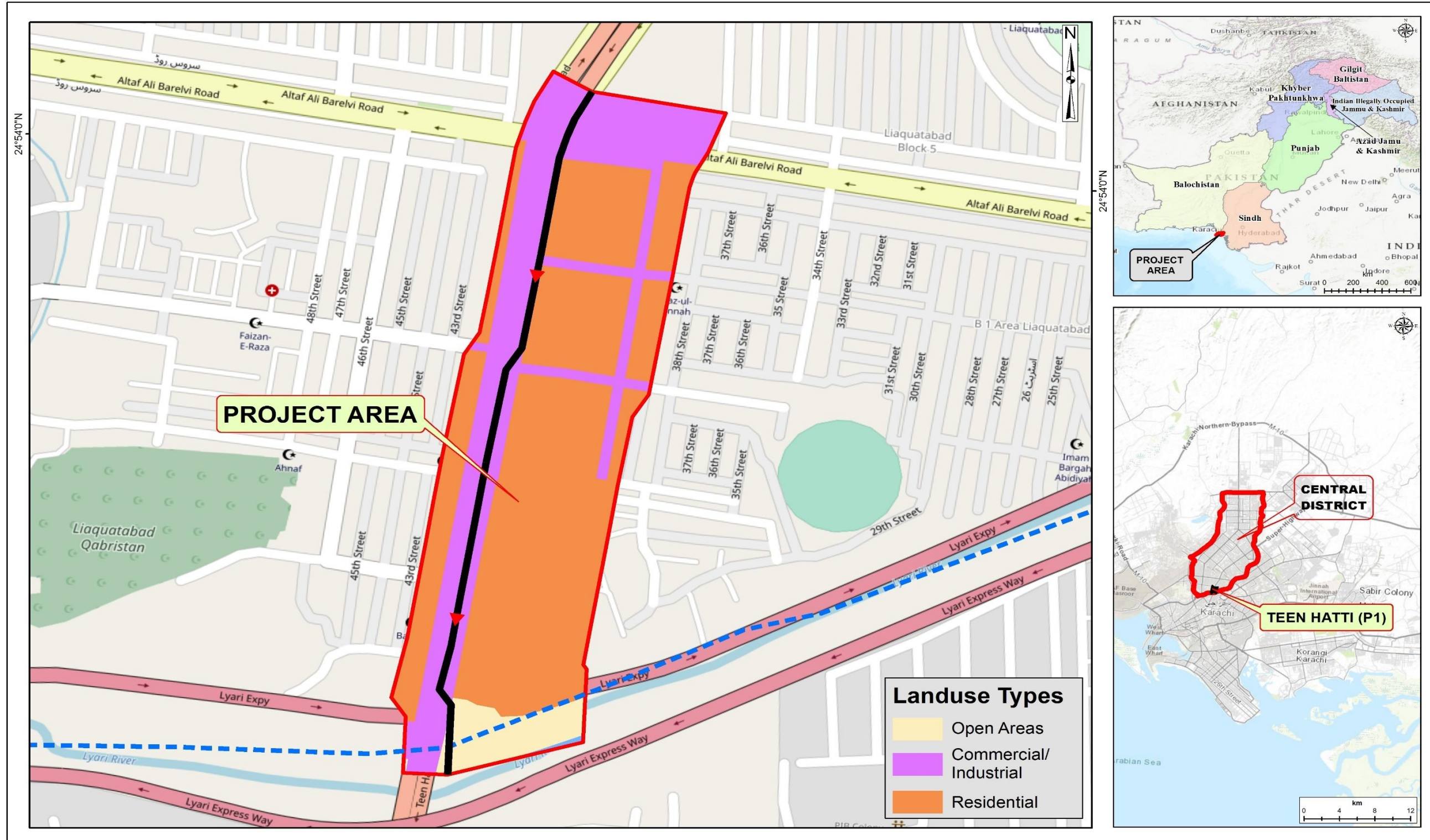
**Table 4.4: Seismic Zones**

Seismic Zone	Peak Horizontal Ground Acceleration "g" is the acceleration due to gravity
1	0.05 to 0.08g
2A	0.08 to 0.16g
<b>2B</b>	<b>0.16 to 0.24g</b>
3	0.24 to 0.32g
4	> 0.32g

**Source:** *Building Code of Pakistan, Seismic Provisions- 2007*

#### 4.4.6 Land use of Project Area

The total area available within the demarcated study area/ Col boundary is approximately 40.57 acres. Land Use of the study area/ Col includes residential area, commercial area and some open spaces. The detailed featured quantification is shown in **Figure 4.12**.



<p><b>CLIENT:</b> PIU-KWSSIP, KW&amp;SB</p>	<p><b>CONSULTANT:</b> <b>NESPAK</b> NATIONAL ENGINEERING SERVICES PAKISTAN (PVT.) LTD HEAD OFFICE:- NESPAK HOUSE 1-C, BLOCK N, MODEL TOWN EXTENSION, LAHORE, PAKISTAN.</p>	<p><b>Legend</b></p> <p> District Boundary</p> <p> Proposed Sewer</p>	<p>0 0.025 0.05 0.1 Km</p>	<p><b>PROJECT:</b> KARACHI WATER &amp; SEWERAGE SERVICES IMPROVEMENT PROJECT (COMPONENT-2, SOP-1) ASSIGNMENT-C</p>	<p><b>LANDUSE MAP TEEN HATTI (P1)</b></p>	<p><b>SCALE:</b> 1:4,000</p>
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Figure 4.12: Land Use Map of Teen Hatti (P1)

#### 4.4.7 Sensitive Receptors

The physical/ cultural resources present within the project boundary are considered as sensitive receptors. Sensitive receptors and their respective sensitivity are listed in **Table 4.5**. **Figure 4.13** presents a comprehensive map of the sensitive receptors of the project area including educational institutes, religious places, medical facilities etc.

**Table 4.5: Environmental and Social Sensitive Receptors**

S.N.	Name/Type of Physical Sensitive Receptor	Remarks
<b>A</b>	<b>Educational Institutions</b>	
1	APWA School	Sensitivity due to access, dust, noise and vibrations especially in teaching hours during construction phase
2	City District GG School	
3	Ayesha Coaching Academy	
4	Q.M English School	
<b>B</b>	<b>Health Institutions / Health Care</b>	
1	Dispensary Liaquatabad	Sensitivity due to access, dust, noise and vibrations especially during construction phase.
2	Homeo cure	Noise and vibration will affect the mental health of patients
<b>C</b>	<b>Mosques</b>	
1	Nawab Mosque	Mosque is sensitive due to access to fulfill the religious rituals.
2	Jamaia Masjid Qadria	
3	Jamaia Masjid Zubaida	
4	Jamia Masjid Allah Wali	

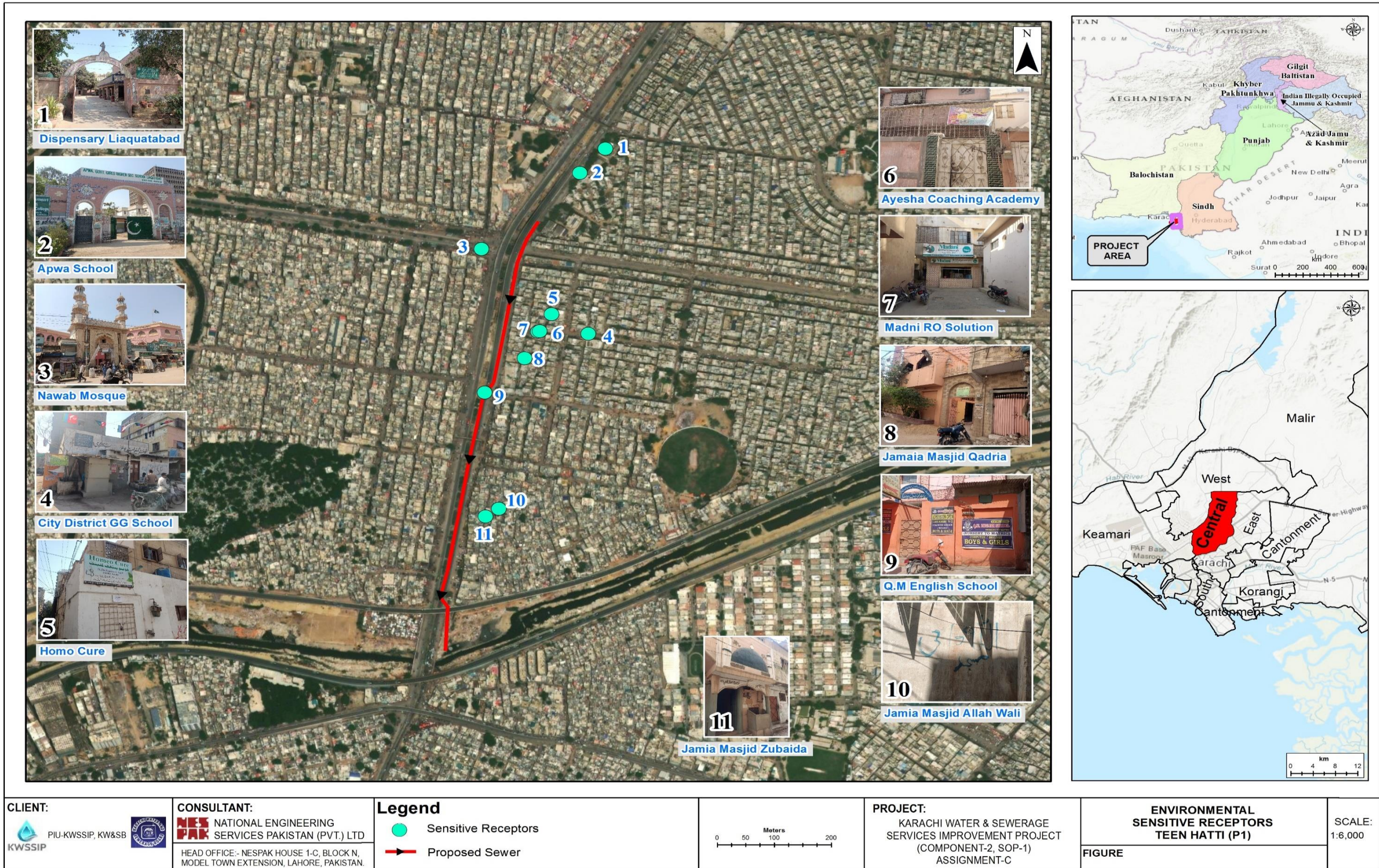


Figure 4.13: Environmental Sensitive Receptors of Teen Hatti (P1)

## 4.5 Biological Environment

The project sites are densely populated urban residential areas having domestic animals (street dogs, cats, rats, lizards and worms etc.) only. Following trees are present in the Col of the project:

**Table 4.6: Inventories of the trees in COI**

Sr. No.	Type of Trees		Number of Trees	
	Common Name	Scientific Name	Along the Median	Service Road
1	Conocarpus	Plum pine	19	---
2	Neem	Azadirachta indica	2	---
3	Pipal	Ficus religiosa	1	2
4	Safeda	Eucalyptus globulus	2	1

However, as per the proposed construction methodology no tree will be affected but for overall environmental improvement tree plantation plan has been proposed later in the document.



**Safeda Tree**



**Peepal Tree**



**Conocarpus**



**Neem Trees**

## 4.6 Socio-Economic Environment

### 4.6.2 Socio-Economic Baseline Structure

This sub-section provides a socioeconomic assessment pertaining to the demographic and socio-economic conditions of the respondents in the project area. Detailed site visits were conducted by Social Experts to appraise the prevailing socioeconomic conditions and to assess the impacts of construction of the proposed project. During the field survey, interviews

and consultations meetings were held with the local residents (Males & Females), pedestrians, shopkeepers, customers etc. in the project area.

#### 4.6.3 Objectives of Socioeconomic Survey

To assess the socioeconomic conditions of the respondents, a social survey was carried out with the following objectives:

- Observe and document the existing socio-economic conditions of the respondents;
- Gain information about the demographic characteristics of the respondents;
- Identify the economic resource dependency of the respondents;
- Explore the situation of civic amenities, sewerage & drinking water conditions, solid waste disposal, education and health facilities etc.
- Get feedback from the community about existing and potential social issues; and
- Evaluate the possibilities of addressing their concern through relevant authorities

#### 4.6.4 Methodology Adopted for Data Collection

Both primary and secondary data were collected to establish the socioeconomic baseline of the project area.

##### A. Primary Data

Primary data was collected through following surveys for impacts identification; assess the socio-economic conditions of respondents settled in the project area;

- Census Survey of the Households (HHs); and
- Socioeconomic Survey of the respondents;

It is pertinent to mention that an Abbreviated Resettlement Plan (ARP) has already been prepared and approved by the WB in view of the livelihood impacts due to restriction in access during execution. However, the sources of income will not be affected and the business can be established again after the completion of works. During the preparation of ARP, the Census Survey was carried out covering 100% (i.e., 03 PAPs) of the HHs affected due to rehabilitation of sewerage scheme network in Teen Hatti (P-01). During census survey door-to-door physical counting of each HHs and key demographic, socioeconomic and contact details of the families were collected.

For conducting Socioeconomic Survey, a sample of 59 respondents selected by using simple random sampling technique. The surveys were conducted between April 5 to April 23, 2022. An interview schedule/ survey tool was developed for the collection of baseline data. During the socio-economic survey, people were informed about the project objective, its location and basic design features etc. The survey tool used for the socio-economic survey is attached as an **Annex-IV**.

## B. Secondary Data

Secondary data was collected from Pakistan Bureau of Statistics (Census 2017), established literature and research. The latest census (2017) released the number of households, populations statistics for all sexes, male female ratio, sex ratio, average annual growth rate of 1998 to 2017.

Following documents were consulted for collection of secondary information:

- Project Appraisal Document (PAD) for KWSSIP (2019);
- Environmental Management Framework (EMF) for KWSSIP (2019);
- Social Management Framework (SMF) for KWSSIP (2019);
- District Census Reports (DCRs) etc. (2017).

### 4.6.5 Administrative Jurisdiction of the Project Area

Administratively, Teen Hatti (P-01), falls in District Central of Karachi. The district is under the charge of a Deputy Commissioner who works under the general control of the Commissioner of Karachi Division. He combines the functions of District Magistrate as well as Collector and responsible for the co-ordination of the function of all nation-building departments and maintaining law and order in the district. The Judicial administration of the district is headed by a District and Session Judge.

### 4.6.6 Secondary Data Results

#### A. Population Composition and Demographic Characteristics

The total population of Karachi Central District is 2,971,626 persons (1,543,950 males and 1,427,349 females). The average annual growth rate is 1.41 percent. Area of the district is 69 square kilometres yielding a population density of 43,063.51 persons per square kilometres with 1.4% annual population change.<sup>13</sup> The literacy rate is 81.52% (81.90% for males and 81.13% for females<sup>14</sup>). **Table 4.7** gives population, its intercensal increase and average annual growth rate from 1998 to 2017.

**Table 4.7: Households, Population Increase, Sex Ratio And Growth Rates**

Sr. No.	Area	HHs	Population-2017				Population 1998	Sex Ratio 2017	1998-2017 Average Annual Growth Rate
			Male	Female	Trans-gender	All Sexes			
1.	Karachi Central District	538,983	1,543,950	1,427,349	327	2,971,626	2,277,931	108.17	1.41

*Source: Pakistan Bureau of Statistics (Census 2017)*

<sup>13</sup> <https://www.citypopulation.de/en/pakistan/karachi/admin/>

<sup>14</sup> [https://en.wikipedia.org/wiki/Karachi\\_Central\\_District](https://en.wikipedia.org/wiki/Karachi_Central_District)



#### 4.6.7 Findings of The Census Survey

##### A. Estimated Affected Households and Population (HHS)

A census and socio-economic survey of the affected HHs (PAPs) was carried out in April 2022. According to the census survey, there are total 3 affected households consisting of 17 persons. **Table 4.8** below shows the population of the sample PAPs.

**Table 4.8: Estimated Population of Affected PAPs**

Name of Scheme	No. of HHs	Total Population	Male	Female	Avg. HHs Size
Teen Hatti (P-01)	3	17	9	8	6.7

Out of total population affected (17 persons of 3 affected HHs), 9 persons are males and 8 are females and average HHs size is 6.7 persons. The male population is higher as compared to female population.

#### 4.6.8 Findings of Socioeconomic Survey

##### A. Community Structure

The proposed alignment is along the main Shahrah e Pakistan Road and project site is an old and well-established commercial area. The businessmen/ shopkeepers from various places have established their businesses and visit the area on regular basis. In most of the cases, the businessmen have rented in the buildings. The businessmen are from various casts and ethnic groups and are successfully running their businesses in the area with the oldest one reported to be over 40 years. It is expected that the businesses/ livelihood may be temporarily affected during execution of the project due to restriction in access because of excavation works.

##### B. Demographic Characteristics of the Population

The census and socio-economic survey results reveal that majority of the HHs/respondents in P1 Teen Hatti were mature enough to participate in the survey. The trend of getting education is quite low which may be due to lack of education facilities and financial constraints. A high percentage of the respondents in P1 Teen Hatti is illiterate. Due to low education level, the livelihood sources of the respondents have narrowed down to the labor works and small businesses including shops/ kiosks etc. Details demographic characteristics of the respondents is given in below **Table 4.9**.

**Table 4.9: Demographic Characteristics of the Population**

Demographic Characteristics	P1 Teen Hatti	
	Total Respondents	
	Count	%
<b>Age Composition</b>		
<b>All Respondents/HHs Heads</b>	<b>59</b>	<b>100%</b>

Demographic Characteristics		P1 Teen Hatti	
		Total Respondents	
		Count	%
1	15-25 years	09	15 %
2	25 – 35 years	16	27 %
3	35 – 45 years	15	25 %
5	Above 45 years	19	32 %
<b>Education</b>			
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
1	Illiterate	21	36 %
2	Up to Primary	09	15%
3	Primary to Middle	10	17%
4	Matric	08	14%
5	Intermediate	07	12%
6	Graduation and above	04	7%
<b>Occupation</b>			
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
1	Business / Shops	29	49 %
2	Labor/Farmer	14	24 %
3	Driver	09	15%
4	Service	0	0 %
5	Private Job	04	07 %
6	Unemployed	02	03%
7	Retired Govt. Employee / No Job	01	02%
8	Kiosks / Carts	0	0%

### C. Marital Status and Family System

Findings revealed that in P1 Teen Hatti, majority were married. The high percentage of married respondents may be due to the reason that majority of them were of mature age group.

The socioeconomic survey also sought to establish the category of families. The category included classifications of nuclear or extended/ joint families. The results showed that majority of respondents in P1 Teen Hatti, were living in joint / extended family system, whereas remaining live in the nuclear families, as reflected in **Table 4.10** given below.

**Table 4.10: Marital Status and Family System**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Marital Status	Married	50	85
	Un-married	09	15

<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Family System	Joint	34	58
	Nuclear	25	42

#### D. Religion

The survey area is predominantly made up of Muslims. No Hindu or Christian community were reported during the survey. Religious breakdown of community is shown in **Table 4.11** below.

**Table 4.11: Religion**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Religion	Muslim	59	100
	Christian	0	0
	Hindu	0	0

#### E. Caste System

The majority in P1 Teen Hatti are Qureshi and Rajpoot followed by Abbasi, Sheikh and Gujjar. The Castes falling in 'Others' category at P1 Teen Hatti were Ansari, Awan, Bachyal, Kathiya, Khan, Lohari, Malik, Mughal, Pathan, Syed and Yousafzai etc. Details are given below in **Table 4.12**.

**Table 4.12: Caste System**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100</b>
Caste	Qureshi	14	24
	Abbasi	03	05
	Sheikh	06	10
	Rajpoot	08	14
	Gujjar	04	07
	Others	24	41

#### F. Sex Ratio

The sex ratio of the population is 1.08. The sex ratio indicates that there balanced population of both males and females in the community.

## G. Mother Language

When respondents were asked about their mother language then it was observed that Urdu language was the predominate language being spoken by majority of the respondents in P1 Teen Hatti Scheme. Besides Urdu, Punjabi was reported as the second largest spoken language, majority of them have migrated from Punjab to Karachi (Sindh). Other languages include Pushto, Saraiki, Sindhi, Balochi and Hindko and Gujrati were also understood and was spoken by the male members of the families. **Table 4.13** shows the language spoken by the respondents.

**Table 4.13: Mother Language of the Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Mother Language	Urdu	41	69 %
	Punjabi	17	28 %
	Sindhi	0	0 %
	Hindko	0	0%
	Pushto	01	1%
	Siraiki	0	0%
	Gujrati	0	0%

## 4.6.9 Socio- Economic Characteristics

### A. Source of Income of the Family

Socioeconomic survey findings depicted that majority in P1 Teen Hatti are doing private jobs. Some in P1 Teen Hatti are working as daily wage laborers. A small percentage in P1 Teen Hatti is jobless. Source of income of the respondents are shown in **Table 4.14**.

**Table 4. 14: Source of Income of the Family Members**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100</b>
Major Income Source of the Family Members	Business	15	25
	Private Job	22	37
	Labor	08	13
	Govt. Job	0	0
	Jobless	01	01
	Any Other	13	22

## B. Monthly Income of the Respondents

The monthly income earned from businesses/shops varied widely between individuals with the lowest earning mentioned being less than PKR 10,000 and the highest earning being between PKR 40,000 and above. It is observed that the respondents were uncomfortable about disclosing their actual incomes or they were unaware of the quantification of their income.

Survey results of P1 Teen Hatti, refer **Table 4.15**, showed that majority of the respondents fall in the range of PKR 20,000 – 30,000 per. Mostly people expressed that their monthly income is insufficient to meet their household demands.

**Table 4. 15: Average Monthly Income of the Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100</b>
Average Monthly Income	Below 10,000	06	10
	10,000 – 20,000	21	36
	20,000 – 30,000	22	37
	30,000 – 40,000	07	12
	Above 40,000	03	05

## C. Expenditure of the Respondents

The analysis of household expenditure patterns is important to determine the welfare levels of households. As previously mentioned, the respondents were uncomfortable to disclose their incomes and expenditures also. Majority respondents of P1 Teen Hatti found within the range of 10,000 – 20,000 PKR, Survey results showed that there are less percentage of respondents who reported their monthly expenditure below 10,000 PKR.

Referred **Table 4.16** revealed that the expenditures include only the basic needs of life i.e., food, health, education and other nonfood items.

**Table 4. 16: Monthly Expenditures Range of the Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100</b>
Average Monthly Expenditures	Below 10,000	04	07
	10,000 – 20,000	23	39
	20,000 – 30,000	22	37
	30,000-40,000	07	12
	Above 40,000	03	05

## D. Normal Working Hours

As far as normal working hours were concerned majority of the respondents fall in the category of 6 – 10 hours in P1 Teen Hatti. Some of the respondents in the project area did not mention their working hours.

**Table 4. 17: Normal Working Hours of the Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100</b>
Normal Working Hours	1 – 5 hours	0	0
	6 – 10 hours	44	75
	11 – 15 hours	11	19
	16 – 20 hours	02	03
	No response	02	3

### 4.6.10 Housing And Construction Patterns

#### A. Housing Construction Pattern

Socioeconomic results showed that the respondents have RCC roofs, stone walls with cement mortar, cement plastering & flooring for the construction of their houses so majority have pacca<sup>15</sup> structures/shops. Generally, the type of material used for construction is an indicator of the economic status of each household of survey area. The details percentages have been mentioned in the following **Table 4.18**.

**Table 4. 18: Construction Pattern of HHs**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Construction Pattern	Pacca	48	81
	Semi Pacca	06	10
	Katcha	05	08

#### B. Ownership Status of the Houses

Sampled respondents were asked about the ownership status of their structures. Most of the respondents in the project area were renters, while remaining were owners as given in **Table 4.19**.

<sup>15</sup>Pacca structures are: RCC roof, stone walls with cement mortar, cement plastering & flooring  
Semi-Pacca structures are: RCC roof, stone walls with cement mortar, without plastering & cement flooring and  
Kacha structures are: CIG Sheet roofing, stone & wood walls with cement mortar, without plastering & cement flooring

**Table 4. 19: Ownership Status of The Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Ownership Status	Owner	28	47
	Renter	31	53

### C. Period of Residence

The socio-economic survey reveals that majority of the respondents have been living from 1 to 20 years in their houses. Some of the respondents were living since birth. A small percent of responded population claimed to live just 3 to 6 months ago. Some respondents expressed to live about 21 to 40 years and some are living from 41 to 80 years in the project area.

**Table 4. 20: Period of Residence of Respondents**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Period of Residence	Since Birth	13	22
	3 – 6 months	01	1.5
	1 – 20 years	29	49
	21 – 40 years	08	14
	41 – 60 years	07	12
	61 – 80 years	01	1.5
	No Response	0	0

### D. Mode of Transport

As far as modes of transportation is concerned, the people normally use both public as well as private transport systems. **Table 4.21** describes mode of transport being used by the respondents during social impact assessment and census survey. Majority reported to use their personal transport (motor cycles & car).

**Table 4. 21: Mode of Transport**

Description		P1 - Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Mode of Transport	Personal	26	44 %
	Public	19	32 %
	Both	11	19 %
	None	03	05%

#### 4.6.11 Drinking Water Source & its Satisfaction Level

##### A. Sources of Drinking Water:

Survey studies reveals that majority of the respondents are using government water supply. In addition to that, some small percent of respondents use bore holes, water tankers.

**Table 4. 22: Source of Drinking Water**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Sources of Water	Government Supply	49	83%
	Bore Hole	06	10%
	Water carrier/ tanker	0	0%
	Hand pump	01	02%
	Any other	03	05%

##### B. Satisfaction with the Source of Water:

Majority of the respondents are satisfied with the water sources while remaining are not satisfied due to some bad taste and bad quality reasons.

**Table 4. 23: Satisfaction Level with Source of Water**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Satisfaction with Water Source	Yes	34	58%
	No	25	42%

##### C. Reasons of dissatisfaction with Source of Water

The survey reveals that the most common reasons of dissatisfaction in the proposed project area includes dirty or polluted water and after that saline water and bad odor exists in water supply lines of P1 Teen Hatti. The 'Satisfied' category includes those respondents who are satisfied with the water sources.



**Table 4. 24: Reason of Dissatisfaction**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
<b>Reasons for dissatisfaction</b>	Dirty/ polluted water	15	60%
	Saline water	01	04%
	Bad odor	09	36%

#### 4.6.12 Sewerage System & its Satisfaction Level

##### A. Sewerage System available

In P1 Teen Hatti, Scheme i.e., almost all the respondents have access to piped sewer system but some small percentages do not have this facility.

**Table 4. 25: Sewerage System Availability**

Description		P1	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100%</b>
Availability of Sewer System	Yes	57	97%
	No	02	03%

##### B. Satisfaction with Sewerage System

Mixed responses were collected regarding the satisfaction with the current sewerage system. The responses are summarized in the **Table 4.26** below:

**Table 4. 26: Satisfaction Level with Sewerage System**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
<b>Response</b>	Yes	30	51 %
	No	29	49 %

### C. Reason of Dissatisfaction with Sewerage System

The survey reveals that the most common reasons of dissatisfaction in the proposed area include choked sewers, overflowing manholes, ponding/ stagnation of water and old sewerage system.

**Table 4. 27: Reason of Dissatisfaction**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
Reasons for dissatisfaction	Choked	05	17%
	Old Sewerage	01	04%
	Ponding/Stagnation	22	75%
	Overflowing Manholes	01	04%

#### 4.6.13 Common Diseases in the Project Area

Access restrictions to safe drinking water and insufficient fulfillment of nutritional requirements have a significant influence on the health status of proposed project population. This is further exacerbated by the shortage of medical facilities within the project area.

**Table 4.28** shows that Malaria and Dengue are the most common diseases which have been reported by majority of the respondents. Although Tuberculosis (TB), Hypertension, Typhoid, Cholera, Diabetes is undoubtedly common.

**Table 4. 28: Common Diseases in the Project Area**

Description		P1 Teen Hatti	
		Total Respondents	
		Count	%
<b>All Respondents/HHs Heads</b>		<b>59</b>	<b>100 %</b>
<b>Common Waterborne Diseases</b>	Malaria and Dengue	08	14
	Diarrhea, flu/fever	02	03 %
	Hepatitis and Jaundice	02	03 %
	T.B, B.P, Typhoid, Cholera, Diabetes	05	09 %
	Skin/ Heart Diseases	01	02 %
	No Diseases	41	69 %

#### 4.6.14 Awareness about the Project

The analysis of the socio-economic survey shows the awareness level about the proposed project in **Table 4.29**. Majority of respondents had no awareness about the proposed project while remaining had some cognizance about this project.

**Table 4.29: Awareness About the Proposed Project**

Description	P1 Teen Hatti		
	Total Respondents		
	Count	%	
<b>All Respondents/HHs Heads</b>	<b>59</b>	<b>100 %</b>	
<b>Awareness about the project</b>	Yes	08	14 %
	No	51	86 %

#### 4.6.15 Perceived Impacts of the Project during and after Construction

The respondents perceived following impacts due to proposed interventions:

- Dust generation
- Increase in noise levels
- Mobility and traffic issues
- Parking issues
- Loss of business

#### 4.6.16 Health Facilities

The health facilities present in the project area include:

- Dispensary of Zacha Bacha
- Homeo Cure (Homeopathic Clinic)

These health facilities will not be affected due to laying of sewer lines. However, during construction phase, health Institutions will face noise, dust and vibration issues, which require special mitigation measures. Pictorial View of Health Institutes falling in the proposed project area has been attached as **Annex-V**

#### 4.6.17 Educational Facilities

The educational institutions present in the project area include:

- Govt. Grammar Boys Secondary School
- City District Govt. Grammar Girls Secondary School
- APWA Govt. Girls Higher Secondary School
- Anwar ul Uloom Govt. Girls Secondary School
- Shaheed flying Govt. Officer Mariyam Mukhtar Govt. Girls Degree College
- Ayesha Coaching Academy
- Q.M. English School (Boys & Girls)

These educational facilities will not be affected due to laying of sewer lines. However, during construction phase, these Institutions will face noise, dust and vibration issues, which require

special mitigation measures. Pictorial view of Educational Institutions falling in the proposed project area has been attached as **Annex-V**.

#### **4.6.18 Religious, Historical, Archaeological and Recreational Sites**

Religious sites in the project area including mosques, shrines, graveyards etc. are given hereunder:

##### **a) Mosques**

- Jamia Masjid Qadriya, P-01 (Teen Hatti)
- Jamia Masjid Zubaida Atariya, P-01 (Teen Hatti)
- Allah Wali Masjid, P-01 (Teen Hatti)

In above mentioned mosques, men offer prayers five times a day. These mosques are used for the religious activities; small madrassas present in these mosques also provide the religious education to children of the local communities. But these mosques will not be affected due to laying of sewer lines. However, during construction phase, these mosques will face noise, dust and vibration issues, which require special mitigation measures. The Pictorial view of Mosques falling in proposed project area has been attached as **Annex-V**.

##### **b) Graveyard**

People are very sensitive about the graveyard because they are emotionally attached to the religious sites. Respondents in P-01 (Teen Hatti) use graveyard which is present in Liaquatabad. In this scheme, graveyard is located but it will not be affected. There is no adverse impact on the graveyard due to construction activities of the project and the local communities have shown no concern.

##### **c) Shrines**

Masoom Shah is the only shrine which is present in the project area.

#### **4.6.19 Mechanism of Conflict Resolution**

During the field survey, discussions were held with the respondents regarding the disputes prevailing and their resolution system in the project area. Most of the conflicts in the project area are insignificant, i.e., quarrels among youngsters, which are mutually resolved within the caste at local level. None of the ethnic issues were reported during the surveys.

#### **4.6.20 Presence of NGOs/ CBOs**

Non-Governmental Organization (NGO) is not identified in P-01 (Teen Hatti), small Community Based Organizations (CBOs) named as Dehli Muslim Rajpoot Bandhani Welfare Association and Community Welfare Centre are working for the welfare of people. It also

focuses on community development, as these type of welfare organizations aims to alleviate poverty, illiteracy, poor health conditions and economic deprivation in the Sewerage Scheme.

#### **4.6.21 Pressing Needs of the Project Area**

Respondents were asked about the pressing needs of their areas. They expressed that provision of better health facilities, better sewerage network, better job opportunities, clean water supply systems, schools, parks and solid waste management systems are the needs of the people. If business losses occur during construction phase, then the alternate options and alternate places should be given to them for the businesses. Sewerage system should be reformed because most of the times the streets are choked due to poor sewerage network. Proper solid waste management should take place specially in front of shops during construction time. Some recommended to build speed breakers in front of shops so that traffic do not choke and runs smoothly during construction phase. Traffic management should be properly planned, parking places should be decided and provided.

Few respondents shared that Govt. supervision is much needed at P1 Teen Hatti for drug dealing under bridges, it should strictly prohibit. Some asked to have inquiry about solid waste dumping during project construction (before & after), as solid waste should not be dumped in drains.

## 5 PUBLIC CONSULTATION

### 5.1 General

This section describes the outcomes of the public consultation sessions held with different stakeholders that may be directly or indirectly affected by the proposed project. The consultation with the PAPs and other stakeholders (women, minorities and disables) during project planning, designing and implementation stages is a key to sustainable development. Likewise, participation of stakeholders is essential to meet the objectives of meaningful consultation for preparation of ESMP. The adequacy of the public consultation is one of the basic criteria used to determine the project compliance with the national / international safeguard policies.

### 5.2 Objectives And Principles of Consultation

The consultation process provides a forum where information relevant to the project is disseminated to the stakeholder. This participation is necessary because it paves a pathway between the investor and the public and enables the provision of much needed local knowledge and indigenous know-how which must be integrated into the project design. This not only fosters goodwill and success in the project but also leads to a conflict- free project implementation.

The stakeholders including government representatives, other regulators and the NGOs were met to evaluate and discuss the environmental and social perspective of project activities. Their valuable concerns and suggestions were noted and thereafter incorporated in the ESMP.

The objectives of the consultation process are to:

- Identify, Inform and involve all stakeholders and residents including females, minorities and disables, in the consultative and participation process;
- Share information with stakeholders on the construction of the proposed project and expected impacts on the physical, biological and socio-economic environment;
- Understand stakeholders' concerns and perceptions regarding various aspects of the project, including the existing available facilities and the likely impacts of construction and operation related activities of proposed Project; and
- Provide an opportunity to the public to provide valuable suggestions in the project design in a positive manner.

### 5.3 Consultation And Participation Process

To ascertain the perceptions of different stakeholders about the project scope, its implementation, operation and evaluation, consultation meetings were conducted. The consultation process was carried out in accordance with the World Bank Guidelines on public consultation. A series of consultation sessions were carried out with PAPs and other stakeholders (women, minorities and disables) of the project area to gain the solicit responses for the project interventions. Tool used for consultation and participation process has been

attached as **Annex-IV**. The meetings were held in the months of October to December, 2021 and January to April, 2022.

The consultant staff preferably chose the sites which are easily accessible and barrier-free to accommodate all people. The consultative sessions/ meetings held mostly at worship places i.e., mosques or in the offices of welfare organizations with both men and women. The minutes of meeting from the focus groups discussions and community meetings have been noted down by the consultant staff and can be shared with the participants (that chose to share their contact information) and the community. These consultative sessions were designed to exchange information, to discuss the strengths, weaknesses, opportunities and threats of an idea or project. The consultation meetings proved very useful in information sharing and consensus building.

#### 5.4 Identification Of Stakeholders

Project stakeholders were engaged in the review and discussions on various project aspects, social and environmental issues at the early stage of impact assessments for feedback. There are two categories of stakeholders in project:

##### Individual/Community Stakeholders

- All project affected persons, households and local communities.
- Project beneficiaries for instance, Residents of the project area (including women, minorities and disables), Shopkeepers, Employees, Customers, Road Users, Vulnerable and Gender.

##### Institutional Stakeholders

- PIU-KWSSIP, KW&SC, Sindh Environmental Protection Agency (SEPA), Commissioner's Office, Trans Karachi, Parks and Horticulture, Sindh Forest & Wild Life Department, Marine Fisheries Department, Sindh Archeology Department, Urban Resource Center (URC), DMC/KMC, K-Electric, Local Govt., Housing and Town Planning Department, KMC/KAC.

#### 5.5 Information Dissemination

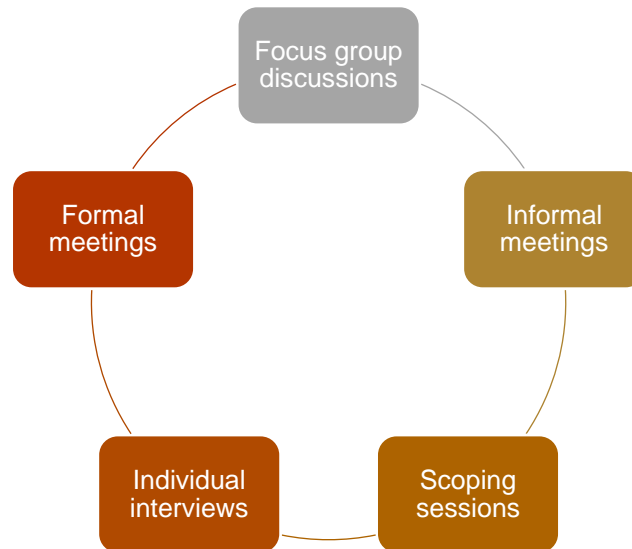
Following information was discussed and disclosed to the stakeholders during the consultation meetings:

- Introduction of the project;
- Description of various project components, its activities and impacts;
- Discuss social and environmental impacts;
- Discuss resettlement related impacts of the project;
- Needs, priorities and reactions of the affected people regarding the proposed projects' impacts; and
- Need of Grievance Redress Mechanism (GRM) in the project area to address the issues & concerns of stakeholders.

For information dissemination to community, culturally appropriate techniques and local language were used.

## 5.6 Methods Of Public Consultation

Public Consultations were carried out to establish stakeholder's opinion regarding project implementation. The following methods were used for public consultation and stakeholder's participation:



## 5.7 Summary Of Formal & Informal Meetings

The concerns raised by all stakeholders were considered in developing the ESMP, to enhance project acceptability among the public on social considerations. **Table 5.1** provides a summary of formal & informal consultation meetings with the local community.

### A. Formal Consultations with Local Community and PAPs.

**Table 5. 1: Schedule of Meetings with Local Community and PAPs.**

Sr. No.	Name of Sewerage Scheme	Date / Time	Venue (Place / Institution)	No. of Participants
1	P-01 (Teen Hatti)	28-11-2021 01:00 pm to 02:00 pm	B Area, Liaquatabad	05 Participants
2	P-01 (Teen Hatti)	01-02-2022 09:00 am to 09:30 am	Teen Hatti Bridge	12 Participants
3	P-01 (Teen Hatti)	06-04-2022 11:30 am to 12:00 pm	Nursery, Daak Khana Chowk	15 Participants
4	P-01 (Teen Hatti)	06-04-2022 12:15 pm to 12:45 pm	B Area, Liaquatabad	08 Participants
5	P-01 (Teen Hatti)	07-04-2022 3:00 pm to 3:55 pm	C Area, Liaquatabad	12 Participants
6	P-01 (Teen Hatti)	08-04-2022 12:45 pm to 1:00 pm	Daak Khana Chowk	09 Participants



## 5.8 Approach Adopted for The Consultation

To hold the meetings, peoples were informed one day before the meeting to assemble in the relevant Sewerage Schemes. In addition, the consultant team contacted the community representatives of each Sewerage Scheme and informed about the purpose of these consultation meetings. The representatives played a positive role in information dissemination to locals of Sewerage Schemes. The meetings held in an encouraging environment where people expressed their concerns and views freely. Formal meetings and interviews were also conducted with female, vulnerable and disabled of the affected community, to explore their needs, problems and priorities related to project execution. In addition to the formal meetings, individual meetings/interviews were also held with the affected females to efficiently involve them in planning process.

## 5.9 Stakeholders Concerns Towards the Project

Concerns raised by the participants, particularly with regard to environmental and social impacts of the project have been listed in following Tables which shows concern and responses as derived from consultation meetings.

### 5.9.1 Concerns and Issues of P-01 (Teen Hatti)

Following **Table 5.2** shows concern and responses of P-01 (Teen Hatti) consultation meetings while photo log of consultation meetings in project area has been attached as **Annex-VI**.

**Table 5. 2: Issues and Findings of the Consultation Meetings conducted in P-01 (Teen Hatti)**

Sr. No	Concerns Raised	Response
1	There is an existing sewerage line but sometimes the manholes get chocked, resulting in overflowing of sewers.	The existing lines will be replaced with the new lines of bigger diameters depending upon the flows. The issue of chocking and overflowing shall be addressed with this action.
2	The area gets inundated during rainy seasons.	There will be provision of storm water in the proposed sewerage network. The issue will of storm water will be somehow resolved with the proposed project.
3	Nursery owner near Daak Khana Chowk was of the view that his business would be affected during the execution of the project.	The concerned person was apprised that he has access from three sides of the road. During execution, access from one only side shall be restricted and others will remain functional.
4	Construction activities must be taken up at night time for minimal disturbance of Business and general traffic.	The schedule of activities will be shared with the local community and business operators before commencement of the work. Efforts shall be made to minimize the loss of business. Furthermore, the PAPs shall be

Sr. No	Concerns Raised	Response
		paid for their losses of business due to restricted access (if any).
5	The residents of the Teen Hatti also demanded that that PIU-KWSSIP should bound the contractor to hire the relevant skilled and un-skilled labour/ workers from the local community.	Local community will be preferred to work as skilled and semi-skilled labours.
6	There are mosques and other religious places in the P-01 (Teen Hatti), efforts should be made to minimize the impacts on them due to construction activities.	The construction work will be planned keeping in view the prayer timings. Furthermore, the work will be executed in pockets to minimize the disturbance.
7	Past experiences are bad. Contractors in similar projects runs off, leaving the trenches open.	The project activities will be monitored by the PIU as well as the supervision consultant. Contractor will be bound to backfill all the open trenches and no patches shall remain open.
8	Along the route the commuters will face mobility issues, it must be avoided to the maximum	Traffic management plan will be developed to avoid the disruption of commuters during construction time.
9	Noise and dust will be generated from construction activities and may cause health issues.	Regular sprinkling of water will be carried out to control the dust emissions at the construction site

### 5.10 Gender Consultations

Individual interviews and consultation meetings were conducted with females of the affected community especially vulnerable and disable, to efficiently involve them in participatory process. Gender consultation meetings and interviews were conducted randomly with 25 women during the month of April 2022 along the proposed alignment in the Col. . The gender survey was conducted in addition to the socioeconomic survey to ensure adequate representation of women of the affected population.

Gender expert contacted females through door-to-door survey and through communication with community representatives of Sewerage Scheme. The tool used for gender consultation meetings has been attached as **Annex-IV**. The representatives contacted with HH Heads to engage women in all consultative sessions. To hold the sessions/meetings, females were informed one day before the meeting to assemble in the selected venue. The venue was selected which were easily accessible to all women. The meetings held mostly at Community Centers. The representatives played a positive role in information dissemination to local females including vulnerable and disable of sewerage schemes. In the meetings females expressed their apprehensions and opinions freely. The women of project area were proactive in participation and showed their significant support for project execution. Photo log of gender consultation meetings in all sewerage schemes has been attached as **Annex-VII**.

The purpose of gender consultations was to ascertain the following information:

- Status of women in project areas;

- Roles and responsibilities of women;
- Women status in decision making at household level
- Underlying issues and pressing needs of the women in project area;
- Issues faced by women due to water ponding and overflowing manholes of the proposed project area;
- Availability of healthcare facilities (especially mother-child healthcare units)
- Awareness of female hygiene and sanitation practices;
- Role of women in WASH services of project area;
- Assessment of harassment issues; and
- Assessment of security, safety and privacy issues; and
- GBV related issues

### **5.10.1 General Issues Raised by Women of Sewerage Scheme P1 Teen Hatti**

The specific issues addressed by women in the proposed project area include:

- Lack of access to safe sewerage system
- Lack of access to job opportunities;
- Lack of primary health care facilities;
- Lack of education opportunities.

The common problems faced by females in P1 Teen Hatti are as follows:

- Poor sewerage system, water ponding occurs in rain;
- Access and movement issues are faced by most of the women due to sewage ponding;
- Privacy issues were raised by females during execution of the project;
- Females have security issues;
- Social environment is not good for women as drugs/ alcohol consumption observed under the bridge of Liaquatabad; women feel insecure and harassed to move alone;
- Women lack in acquiring new skills like vocational trainings, stitching / embroidery etc.
- Literacy rate is mostly low due to social and financial constraints;
- Lack of educational facilities prevailing ignorance add to less literacy among the females;
- Upgrading of schools
- Mother child care centers are less in number;
- No KW&SC Office/ Customer Service Centers to register their complaints/ grievances regarding water and sanitation related issues;
- Non-availability of Associations/ Organizations for females; and
- No Offices/ Departments to report domestic issues.

### **5.10.2 Pressing Needs of Women in Project Area**

Women of the affected families were also inquired about their pressing needs. The needs identified by the women of the project area include the following:

- Upgrading of schools;

- Better medical facilities i.e., Gynae hospitals/ dispensaries,
- Vocational training institutes;
- Due to restricted mobility of women, they suggested women friendly grievance mechanisms to address their concerns specifically elderly, single and those with no male support; and
- Female education plays a vital role in the reduction of poverty and contributes to sustainable growth in developing nations. So, the attention must be paid to the promotion of female education for structural transformation and economic growth.

### **5.11 Consultation With Institutional Stakeholders**

**Table 5.3** shows the concerns of institutional stakeholders while photo log of consultation meeting in each department has been attached as **Annex-VIII**.

**Table 5. 3:Concerns of Relevant Government Departments**

Sr. No.	Department	Representatives of Departments	Consultant / Client Team	Date	Points of Discussion /Apprehensions	Response
1	Commissioner's Office	<u>Assistant Commissioner</u>	<u>Env. Specialist KWSSIP</u> <u>Social / Gender Expert KWSSIP</u> <u>GIS Expert Sr. Env. Engineer</u>	28.02.2022	<ul style="list-style-type: none"> <li>AC informed that 30 focal persons from different DMCs and KMC have been trained to collect AED related data through a mobile app named Kobo Collect for CLICK project.</li> <li>It was suggested by the participants to nominate already trained personnel for collecting AED data for KWSSIP.</li> </ul>	It was decided that a field plan will be shared with the AC office which will be forwarded to the concerned DC offices for nomination of focal persons.
3	District Municipal Authority / Karachi Municipal Authority (DMC/KMC)	<u>Incharge Anti-Encroachment of DMC East</u> <u>GIS Expert of DMC South</u> <u>Deputy Director Anti-Encroachment of DMC Central</u> <u>DMC Kemari</u>	<u>Team Leader NESPAK</u> <u>Sr. Engineer NESPAK</u> <u>Sr. Engineer NESPAK</u>	03/3/2022 & 04/3/2022	<ul style="list-style-type: none"> <li>Requirement of a Focal Person to collect AED related data for KWSSIP.</li> <li>Planning for joint surveys with Focal Persons nominated by DMC.</li> <li>To find out current status of AED.</li> </ul> <p>Requirement of data regarding AED related activities in the project area by conducting informal public consultations to ascertain the views and information from the locals including residents and business operators.</p>	<ul style="list-style-type: none"> <li>Information from focal person of concerned district;</li> <li>Visual observations of focal persons, Consultants and KWSSIP experts at the time of screening survey; and public consultations</li> </ul>
4	Sindh Environmental Protection Authority (SEPA)	<u>Deputy Director Technical</u>	<u>Env. Specialist KWSSIP</u> <u>Team Leader NESPAK</u> <u>Sr. Env. Engineer NESPAK</u>	12/4/2022 & 03/04/2023	<ul style="list-style-type: none"> <li>In conducting ESMP, Scoping sessions and Individual interviews should be conducted with all stakeholders.</li> <li>Social issues regarding private land acquisition, business loss and their compensations were discussed in detail.</li> </ul>	A meeting was held with Deputy Director (Technical), SEPA regarding submission of requisite environmental document. It was conveyed that IEE is required for SEPA before commencement of the project (Refer Schedule 2 of SEPA regulations 2021). The

Sr. No.	Department	Representatives of Departments	Consultant / Client Team	Date	Points of Discussion /Apprehensions	Response
					<ul style="list-style-type: none"> <li>• Baseline should be developed separately according to baseline conditions of all districts of Karachi.</li> <li>• Public consultations must be done so that stakeholders who have different type of stakes along with their apprehensions can be listed down easily.</li> </ul>	minutes of meeting are attached as <b>Annex – IX</b> .
5	Parks and Horticulture	<u>Director General Park</u>  <u>Deputy Director Parks</u>	<u>Team Leader NESPAK</u>  <u>Sr. Engineer NESPAK</u>  <u>Sr. Engineer NESPAK</u>	13/4/2022	<ul style="list-style-type: none"> <li>• Efforts should be espoused to save existing plantation;</li> <li>• Plant 5 trees in the replacement of 1 tree which will be cut down. Trees must be 6-8 ft. high.</li> <li>• Coconut, Mangroves, Date palms, Cheeku, Guava, Badam, Neem, Pequma are the major trees of Karachi.</li> </ul>	Tree plantation plan is also included in the project for environmental improvement.
6	Sindh Forest & Wild Life Department	<u>Conservator Wild Life</u>	<u>Team Leader NESPAK</u>  <u>Sr. Engineer NESPAK</u>	13/4/2022	<ul style="list-style-type: none"> <li>• Conservator was of the opinion that due to different developmental projects; the ecology &amp; overall environment of the region is already damaged and no compensations were made to the concerned line departments for implementation of mitigations plans.</li> <li>• Line departments should be taken onboard at various forums and for different activities like tree plantation</li> <li>• The construction will definitely cause short- &amp; long-term negative impacts on wild species of the area</li> </ul>	<p>NESPAK team briefed that no wildlife is involved in the project area.</p> <p>The minimum tree cutting will be suggested/recommended in ESMP report. The line department is welcome to make any suggestions to further improve the suggested mitigation measures To protect wildlife, Wildlife Protection Act 2020 will be mentioned in ESMP. Specially Section 9 (clauses 123) and Section 86,</p>

Sr. No.	Department	Representatives of Departments	Consultant / Client Team	Date	Points of Discussion /Apprehensions	Response
					<ul style="list-style-type: none"> <li>The officials suggested to avoid habitat losses during construction time. He also shared secondary data on wildlife of the study area.</li> </ul>	(clauses 91 b) as suggested by Conservator Wildlife.
7	Urban Resource Center (URC)		<u>Team Leader</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>	14/4/2022	<ul style="list-style-type: none"> <li>Public Hearing must be done so that locals who belongs to all professions can raise their concerns and suggestions for the proposed project.</li> <li>The announcements should preferably be done in Community Centers and Worship places of locals so that local community can easily attend the public hearing and raise their issues/concerns and other responses.</li> <li>Presentations about the proposed project and its anticipated impacts on the physical, biological and socio-economic environment of the project area should be prepared to inform the public.</li> <li>Stakeholders who have a direct or indirect impact in the project development should be involved in the consultation process</li> </ul>	The suggestions shall be considered during the data collection and public consultation process.
8	K-Electric	<u>Public Relation Officer</u>	<u>Team Leader</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>	15/4/2022	<ul style="list-style-type: none"> <li>Construction is not allowed under the transmission lines.</li> <li>The utilities to be disturbed (if any) should be restored/ rehabilitated on priority basis to minimize the impacts.</li> </ul>	None of the K-Electric installations will be disturbed during the execution of the project.

Sr. No.	Department	Representatives of Departments	Consultant / Client Team	Date	Points of Discussion /Apprehensions	Response
			<u>Sr. Engineer</u> <u>NESPAK</u>			
9	Local Govt. & Housing Town Planning Department	<u>Project Director</u>	<u>Team Leader</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>	15/4/2022	<ul style="list-style-type: none"> <li>Paved / asphalted roads and smooth / concreted streets is a need of proposed project area</li> </ul>	Efforts shall be made to provide black top cover in the streets of selected Sewerage Schemes.
10	Marine Fisheries Department	<u>Hydrologist</u>	<u>Sr. Env. Engineer</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>	21/4/2022	<ul style="list-style-type: none"> <li>Discharge of 540 MGD of wastewater into the sea affects the fish and marine environment</li> </ul>	The project will dispose the wastewater to the sea after adequate treatment.
11	Sindh Archeology Department	<u>Director</u> <u>Antiquities and</u> <u>Heritage</u>	<u>Sr. Env. Engineer</u> <u>NESPAK</u>  <u>Sr. Engineer</u> <u>NESPAK</u>	21/4/2022	<ul style="list-style-type: none"> <li>No archeological sites are present in the project area.</li> <li>The project needs to be carefull about the chance finds.</li> </ul>	Chance find procedures have already been developed for the project.
12	<b>Directorate General of Antiquities, Government of Sindh</b>		<u>Sr. Env. Engineer</u> <u>NESPAK</u>		<ul style="list-style-type: none"> <li>No historical building/ Archeological site is present in the proposed project area.</li> </ul>	The archaeological site if found in the vicinity of proposed Project Area will be preserved in any case.



### **5.12 Pressing Needs of The Consulted Sewerage Scheme Suggested by Local People**

Local people/ community were inquired about the pressing needs of the project area as perceived by them during the above referred consultation meetings. The foremost preferred needs are upgrading sewerage systems. Apart from this, schools, hospital/ dispensary, vocational training institutes, preference to locals in construction work. Due to restricted mobility, they suggested that a friendly grievance mechanism should be developed in Sewerage Scheme to address their concerns during construction time. Guidance and support to local people in preparation of required documents for compensation was also recommended.

### **5.13 Disclosure of ESMP**

Public disclosure enables affected groups and interested parties to understand likely implications of the project and to provide input into project design. It promotes dialogue among stakeholders i.e., government, community, NGOs and implementing agencies. As per OP 4.01, for all Category A and B projects the environmental and social aspects must be discussed with the stakeholders.

The objectives of public disclosure are to aid meaningful public consultation and to ensure transparency of World Bank operations to its stakeholders and constituents.

The safeguard documents will be disclosed on the website of PIU-KWSSIP and on the World Bank projects and operations site.

Presentations containing project information and relevant aspects of public interest will be delivered to the public. Furthermore, project brochures, handouts of presentations, executive summaries of ESMP and ARP in Urdu and English languages will also be distributed to the public.

After the approval, Copies of the ESMP shall be made available to communities and interested parties in accessible locations through local government authorities, (e.g., district offices etc.)

## 6 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

### 6.1 General

This chapter identifies the beneficial as well as the potentially significant adverse environmental and social impacts of the project activities during design/ pre-construction, construction and operational phases of the proposed project on the physical, ecological and socio-economic domains of the environment. The appropriate mitigation and remedial measures are proposed in this chapter. A brief description of each aspect and the affected environment in the project area is presented below.

### 6.2 Scoping of Impacts

Potential environmental and social impacts from the proposed Project on key environmental and socio-economic features in the Project area were identified through the following actions:

- Selection of the Area of Influence (CoI) and marking with the help of Google Earth;
- Desk Study of engineering investigations, studies and designs;
- Environmental quality baseline monitoring of air, noise, surface water, wastewater and groundwater;
- Detailed review and analysis of primary and secondary data available for all environmental parameters in Project area such as physical, ecological and social resources;
- Socio-Economic survey to assess the extent of land acquisition, occupation, income and poverty levels of the affected households;
- Consultations with executing and implementing agencies, local government, affected community, and traditional and religious leaders of community;
- Stakeholder consultations with relevant departments, government agencies, NGOs and locals; and
- Knowledge assimilation of international best practices on environmental assessment of infrastructure projects.

### 6.3 Methodology

Selection of an appropriate and customized methodology for the impact assessment is critical for the ESMP study. The impacts have been assessed based on the proposed project life cycle i.e., Pre-Construction, Construction and Operational and Maintenance (O&M) stages. Each phase is assessed based on the area of impact categorized on domain wise i.e., physical, ecological and socio-economic. For the identification of the potentially significant and non-significant environmental and social impacts, different tools were utilized as detailed below.

#### 6.3.1 Screening Checklist

Based on the findings of desk studies, processed satellite imageries, screening checklists were prepared to screen out the potentially significant adverse environmental and social impacts during pre-construction, construction and operational phase of the proposed Project.

The objective of the impact screening is to assess the significance of the issues related to the atmosphere, climate, water resources, land resources, ecological environment, socio-economic environment, transport, infrastructure and communication, natural risks, hazards and external constraints of the Project for the proposed development. After the compilation of baseline information, processing of acquired satellite imagery, the screening checklist was filled to screen out the adverse impact of the proposed Project during the pre-construction, construction and operational phases.

### 6.3.2 Notion of Significance

The “notion of significance” is based on the following criteria:

**Extent:** The scale of impact, i.e., limited to the immediate areas of development activity (the site); limited to within a distance reach of the development or affecting the region as a whole; or occurring at a national or international scale; Col of project site is 200 m around the construction area.

**Duration and Frequency:** A prediction/forecasting of the lifetime of the impact: i.e., short-term; medium term; long term with the impact ceasing after the operational life of the development; or considered permanent and how many times the event will occur during that period;

**Intensity:** A description of the intensity (magnitude/size) of the impact: i.e., high, medium, low, or negligible (no impact). The specialist studies must attempt to quantify the magnitude of impacts and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact;

**Reversible/Irreversible:** Changes considered irreversible, for example, the loss of biodiversity due to a change in water quality;

**Probability:** The likelihood that the event will occur; and

**Legal Restriction:** If the action is likely to affect or be affected by a legal restriction.

Considering these criteria, potential significance was classified as either:

**Low:** an impact for which no mitigation is necessary;

**Medium:** an impact that requires effective mitigation; and

**High:** an impact, which, if not mitigated, could stop the Project from proceeding.

The potentially significant impacts were then further investigated in more detail to make a comprehensive assessment of the actual impacts.

### 6.3.3 Study Area/ Corridor of Impact (Col)

Refer Chapter 4: Description of the Environment, **Section 4.3**.

## 6.4 Anticipated Impacts during Pre-Construction/Design Phase

Impacts envisaged during Pre-construction/ Design Phase and the recommended mitigation measures are given below:

#### **6.4.1 Layout Planning & Design**

##### **Potential Impact**

Incompatible layout planning and engineering designs of the proposed project can undermine the overall aesthetics and ambience of the project area. Utilization of the available spaces and designing the layout without considering the prospective and futuristic needs may result in design with low social acceptability and functionality. This impact will be irreversible and medium adverse in nature.

##### **Mitigation Measures**

- All structural, layout and engineering design of the project are in strict accordance with the applicable national and international guidelines/ codes/ standards and engineering practices.

#### **6.4.2 Selection of Poor Construction Material**

Groundwater quality may be affected significantly due to leakages by selection of poor material for sewerage pipes and force main. In the long run it can result in health and hygiene problems in the service area. This impact will be irreversible and medium adverse in nature.

##### **Mitigation Measures**

- Public health problems will be overcome by appropriate selection of the locally available construction material, which are safe for human use, and choice of pipe material and sizes satisfying the requirement of the area.

#### **6.4.3 Environmentally Responsive Design Considerations**

##### **Potential Impact**

Improperly designed sewers may not carry the waste load, leading to failure and financial loss. The alignment of sewer lines will be properly planned, else it may lead to both technical and social problems along with environmental issues of back flow creating foul smell and unhygienic conditions.

There are chances of infiltration from sewers which may contaminate the soil and underground water resources. The impact will be irreversible and low adverse in nature.

##### **Mitigation Measures**

- All sewer lines have been designed considering the future population and waste generation rate;
- Limited the sewer depth where possible;
- Sewers will be laid away from water supply lines (at least 1 m, wherever possible);
- In all cases, the sewer lines will be laid below water pipeline (the difference between top of the sewer and bottom of water pipeline will be at least 300 mm);

- For shallower sewers, use of small inspection chambers in lieu of manholes;
- Designed manhole covers to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/ garbage entry;
- Ensured sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to ensure self-cleansing velocity in order prevent built up of solids and hydrogen sulfide and methane generation;
- As an anti-theft measure, large manhole covers around 3 feet in diameter have been proposed. The proposed manhole covers are heavy in weight and cannot be lifted easily, without machinery; and
- All structural, layout and engineering designing are in strict accordance with the applicable by-laws and engineering parameters.

#### **6.4.4 Groundwater**

##### **Potential Impact**

Groundwater contamination may occur during construction by the improper handling of construction material (fuel, lubricant, bitumen, asphalt etc.) or sanitary water from construction camps and domestic sewage. During operation probability of seepage through the sewers may also contaminate groundwater. However, the impact will be low adverse because the groundwater table was not encountered up to maximum investigated depth of 8.0 m below NSL for proposed project sites.

##### **Mitigation Measures**

- The seepage control measures have been included in the design which include protective coatings (i.e., bitumen and epoxy) in the internal and external layers of the pipes;
- Procedure for efficient jointing of selected sewer pipes will be adopted to avoid leakage from pipes;
- State of the art sewers will be used to cater the issue of possible leakage from sewer pipes in order to avoid groundwater contamination; and
- During the replacement of existing lines, the respective manholes will be closed and the sewage from preceding manhole will be pumped to the next manhole using a flexible pipe.

#### **6.4.5 Surface Water**

##### **Potential Impact**

At present, the raw sewage from the project area being disposed of in the existing wastewater drain which ultimately discharge into the Lyari river and road side drains.

There will be net environmental improvement in terms of sewage collection thus reducing sewage ponding in the project area and enabling disposal of wastewater into the sea after treatment.

### **Mitigation Measures**

- The collected sewage will be disposed of into Layari Interceptor which ultimately connects to TP-3, which is undergoing capacity enhancement. By the time, the proposed sewerage scheme will be commissioned, TP-3 will be ready to cater the discharge of the scheme.

#### **6.4.6 Seismic Hazard**

### **Potential Impact**

The project area is in Seismic Zone 2B (moderate). However, no major earthquake has hit Karachi for the past multiple decades.

### **Mitigation Measures**

- The components of the proposed project include laying of underground sewer lines have been designed to withstand moderate earthquakes; and
- To mitigate the seismic hazard, Seismic Building Code of Pakistan 2007 (SBC-07) has been adopted in design of manholes. This code specifies minimum requirements for seismic safety of buildings/ structures and has to be applied and used by engineers in conjunction with the necessary understanding of the concepts of structural, geotechnical and earthquake engineering.

#### **6.4.7 Public Utilities**

### **Potential Impact**

Due to the proposed project, public utilities including telephone lines, electric poles & wires and gas pipelines may be affected that may cause inconvenience to the general public. This impact is however short term/ reversible and medium adverse in nature.

### **Mitigation Measures**

- Careful selection of the sewer alignment has been adopted to minimize disturbance to public utilities;
- The public of the project area will be informed before execution of relocation of services (if any) and schedule of relocation services will be prepared in consultation with locals of project area in order to minimize inconvenience to the public;
- Construction contractor will be directed to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. A sanitation plan (**Annex-X**) will be adopted in design phase to avoid sanitation related issues.

## 6.4.8 Physical Cultural Resources

### Potential Impact

As per the meeting in Directorate General of Antiquities, Government of Sindh, no historical/ archeological site is present in the subproject area. However, some cultural resources including mosques, churches, temples, shrines and graveyards are present. Physical and cultural resources identified in the project area are listed in **Section 4, Table 4.5, Table 4.6, Table 4.7**. People visit the mosques five times a day. Shrines and graveyard are visited occasionally by the surrounding community and devotees. These will not be directly affected but the people may face temporarily access issues in visiting these facilities during construction of the project.

### Mitigation Measures

- The access to physical and cultural resources will not be affected and alternate access route will be provided in case the access has to be restricted during execution period; and
- There will not be any physical impact on the physical and cultural resources in the project area.

## 6.4.9 Ecology

The impacts of ecology are anticipated to be low adverse in nature.

### A. Flora

#### Potential Impact

No trees are envisaged to be cut/disturbed due to proposed subproject activities. However, the movement of heavy vehicles, excavations and backfilling will generate dust that may stick to leaves of trees in the project area and its immediate surroundings. The soiling of leaves will close the pores of trees and may slow down the photosynthesis process. However, the impact will be temporary and low adverse in nature.

#### Mitigation Measures

- Regular sprinkling of water will be done to suppress the dust;
- The movement of construction machinery will be confined to the project site;
- The construction camps will not be allowed to set up in the area with adequate green cover; and
- A tree plantation plan has been proposed and given in the proceeding section for net environmental improvement in the project area.

## **B. Fauna**

### **Potential Impact**

The impact on fauna of the project area will be insignificant, except few insects that will be disturbed/ killed during excavation operations. The impact on fauna is temporary and low adverse in nature. This impact is site-specific, temporary, reversible, possible, and low adverse.

### **Mitigation Measures**

- No mitigation required.

## **6.4.10 Socio-economic Environment**

### **Potential Impacts**

During the planning and design phase of the project, it is anticipated that there will be no potentially significant adverse impacts on the socio-economic environment. Locals may be temporarily disturbed due to the field investigations activities. This impact can be categorized as indirect, low, site-specific, short term, temporary, low probable and reversible.

### **Mitigation Measures**

- All the project stakeholders have been taken on board through effective consultation process and their issues have been addressed in the project design.

## **6.4.11 Land Acquisition**

### **Potential Impact**

No private land acquisition is involved in the proposed project. Major part of the project involves replacement of existing sewers and new sewers lines will be laid in the right of way (ROW) of existing streets/ roads hence no additional land is acquired.

## **6.4.12 Urban Flooding**

### **Potential Impact**

Urban flooding is a new environmental challenge faced by the residents of the city during recent times. The problem has aggravated in the recent times due to uncertain increase in the intensity of rains during the monsoon. The problem will exacerbate during the construction activities due to open trenches. The sludge trapped in the buried/ removed pipes will be washed out and create nuisance in the surroundings. It may also lead to spread of diseases and serve as breeding ground for disease vectors. This impact is high adverse in nature.



## **Mitigation Measures**

- None of the construction activities will be undertaken during the monsoon/ rainy season;
- All the open trenches/ pits will be covered/ backfilled before the rain;
- Weather forecast will be studied before commencement of major activities;
- The proposed sewerage system will have the capacity to accommodate a portion of stormwater.

## **6.5 Anticipated Impacts during Construction Phase**

Anticipated Impacts during Construction Phase and the recommended mitigation measures are given below:

### **6.5.1 Topography**

#### **Potential Impact**

The construction activities are not expected to impact the topography of the area significantly except for those areas where physical activities including digging and excavation areas, storing or dumping sites for excessive material and movement of heavy construction machinery will be carried out. The excavated material is to be mostly backfilled. This impact is site-specific, temporary, reversible, possible, and low adverse.

#### **Mitigation Measures**

- Material stockpiles will be removed as soon as work is completed, and the area will be re-landscaped;
- Temporary storage sites will be allocated for the storage of excavated material;
- Temporary storage sites will not allow infiltration as the construction methodology proposes dumping excavated material in front of the excavated patch and then backfilling before proceeding to the next pocket. In the current scenario, the patch being a road will already be lined
- The stockpiles will be covered with tarpaulin sheets or other adequate material;
- Piling of material at large extent will not be allowed and the contractor will timely remove excavated material from the site; and
- The excavated material, including old sewer lines, existing sludge, and other mucking material, will be transported to the KWSC workshop. As per common practice, the old pipes will be dismantled, and the materials will be utilized within the workshop. The workshop also functions as a small pipe factory, where these materials will be utilised. Additionally, the sludge can be disposed of at the approved dumping site in Jam Chakro (North Karachi)

## 6.5.2 Soil Erosion

### Potential Impact

The soil will be exposed to erosion due to excavations for removing existing damaged sewer lines and also laying of sewers pipes. Construction activities such as clearing, excavation, filling, grading and setting up construction camps will affect the existing soil condition in the study area/ Col. There is also a possibility of silt runoff during rainy season causing soil erosion. During the rain, the eroded soil mixes with stagnant water to transform into slush, which can affect movement of vehicles and machinery and construction work as well as limit the movements of local people. This impact can be categorized as low adverse, site-specific, long term, permanent and highly probable and reversible.

### Mitigation Measures

- Use of heavy machinery will be restricted as far as possible;
- Confining excavations to the specified spots as per the approved engineering drawings;
- Stored excavated material will be covered and preferably reused, e.g., in construction as backfill etc.

## 6.5.3 Soil Contamination

### Potential Impact

Contamination of soil may also be caused by oil and chemical spills from construction machinery or uncontrolled runoff from equipment washing yards. The removal of sludge from old sewers may also contaminate the soil. This impact is irreversible and low adverse in nature.

### Mitigation Measures

- Store chemicals/ hazardous products and waste on impermeable surfaces in secure, covered areas with clear labelling of containers and with a tray or bund to contain leaks;
- Regularly remove all construction wastes from the site to approved waste disposal sites;
- Awareness in emergency spill response procedures will be conducted;
- Oil leakages, chemicals and other liquids spills will be avoided/ minimized by providing appropriate storage places depending on the type of material for storage. Oil and other lubrication material will be stored in water proof tanks especially built for oil storage. These tanks will be stored away from the main road and residential areas or safety purposes, in case of establishment of construction camps. Access to these tanks will only be allowed to the authorized personnel. Safety equipment like fire extinguishers will be placed near these places along with signs for danger and fire;
- The vehicles/ dumping trucks will be lined up before digging out the old sewer. The sludge will be removed in presence of the dedicated staff, will be put it in the specialized vehicles and taken for the disposal.
- During removal of sludge or sewer pipe, proper use of PPEs and gas masks will be

ensured; and

#### **6.5.4 Trench Failure**

##### **Potential Impact**

The major construction activities involved in the project is excavation for laying sewerage lines. The major hazard associated with the excavation operations is trench failure. The unstable slopes may fail and settle in the trenches which may cause injuries and fatalities to the workers as the maximum depth is 22 feet. This impact is probable, site specific and high adverse in nature.

##### **Mitigation Measures**

- Provision of adequate shuttering in the trenches;
- Leftover shuttering may also be used in case of loose soil strata;
- Provision of fencing, barricading of trenches; adequate lighting and provision of safety signs;
- Workers training and tool box talks on regular basis; And
- Refilling on non-active sites immediately.

#### **6.5.5 Interference with Other Utilities**

The proposed sewers may interfere with the existing utilities including water supply, gas pipes and telephone lines causing disruption of these services and causing inconvenience.

##### **Mitigation Measures**

- The PIU and contractor will keep close liaison with concerned departments;
- PIU will ensure provision of maps of existing utilities to the Contractor, supervision of excavation activities and placing sewer lines away from existing utilities;
- In case of any relocation of other utilities, these will be relocated well in advance;
- In case of any damaged lines the restoration/replacement of damaged utilities will be done immediately to avoid any disturbance to the people.

#### **6.5.6 Disposal/ Removal of Old Clogged Sewer Pipes**

##### **Potential Impact**

The projects involve provision of a sewerage line addition to the existing line to reduce the burden of sewage on the existing line. Most the proposed line will be laid parallel to the existing pipe. However, a portion (i.e., 94.75 m) of the existing line will need to be replaced. There is existing sludge in that portion of the line and will need to be taken care of otherwise it will lead to nuisance including spread of odor, diseases and will serve as breeding ground for disease vectors. However, the sludge will be of smaller quantity but the impact will be high adverse in nature.

### **Mitigation Measures**

- Sludge will be covered to avoid nuisance;
- Sludge will be removed immediately and disposed of at suitable site as per best engineering practice including all the health & safety measures to be followed for the waste handlers and drying the sludge. The disposal arrangement will be finalized by the Contractor;
- The vehicles/ dumping trucks will be lined up near the active construction sites before digging out the old sewers. The sludge will be removed and directly loaded in the trucks;
- During removal of sludge or sewer pipe, proper use of PPEs and gas masks will be ensured; and
- The old sewer pipes and other waste material will be immediately removed. The old sewer pipes as per routine practice will be taken to the Workshop of KWSC where the pipes will be dismantled and the material is utilised in the workshop.

### **6.5.7 Construction Camps/Camp Sites**

#### **Potential Impact**

Improper construction camp location and mismanagement of construction camp activities can lead to various social and environmental impacts which may include noise, health and safety, traffic problems, soil degradation, loss of vegetation and assets on the selected land, solid waste, water pollution and gender related issues. Furthermore, cultural differences, behavior of construction workers, potential disregard for local cultural norms can lead to increased tension between local communities and workers residing in the construction camps. This impact is temporary and medium adverse in nature.

#### **Mitigation Measures**

- Contractor will select the camp site keeping in view the possible environmental and social issues with the approval of PIU and relevant authorities;
- Waste Management Plan will be implemented to include procedures for the classification, storage and disposal of all construction wastes and the training of employees handling the hazardous materials; and
- Construction camps will be established away from populated areas.
- Regular training of workers will be carried out regarding local cultural norms, human behaviour, gender issues by the contractor during construction activities at site.
- Workers Grievance Redress Mechanism will be fully implemented and active so that locals may lodge complaint and are addressed on time.

### **6.5.8 Storage of Construction Material**

During the construction phase, the construction materials will need to be stored onsite. The Contractor may occupy the neighbouring private property for labour camps & offices, material depot, machinery yard, access road and work site.

## **Mitigation Measures**

- Sequencing of activities so that only controlled amount of construction material is stocked near work area;
- Contractor will submit the construction schedule to concerned department in advance;
- Providing residents with advance warning of construction activities;
- Contractor will be responsible to utilize either the project site or the rented property for material storage, offices etc.

### **6.5.9 Air Quality**

#### **Potential Impact**

Air quality will be affected by various construction activities. In certain climatic conditions such as hot summers, airborne dust and particulate matters can become a major nuisance if control techniques are not properly employed. The critical sources of air pollution during the construction phase will be:

- Unpaved road surface;
- Transportation of materials;
- Excavation operations
- Construction equipment;
- Vehicular exhaust; and

The air emissions may cause health impacts such as dryness and roughness of the throat, eyes, nose, etc. to the workers, staff of the contractor and the residents of area. List of air sensitive receivers is given in **Section 4, Table 4.6**. The impact is high adverse and temporary in nature.

Furthermore, during construction stage, the dust level may increase considerably. All earthworks construction, site clearing, stockpiling, operation of batching plants and hauling of materials will generate dust and affect the local air shed. Local people and the workers may be exposed to high dust levels during landscaping, access road and site preparation. This impact is site-specific, temporary, reversible, likely and high adverse.

#### **Mitigation Measures**

- All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained in order to minimize the exhaust emissions;
- Open burning of solid waste from the contractor's camps will be strictly banned;
- SEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works.
- Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s);
- Excavated trenches will be restored immediately to original level and paved after laying of sewer pipes;

- Blowing of dust and particulate matter from stockpiled loose materials (e.g., sand, soil) will be avoided either by sheeting them with tarpaulin or plastic sheets or by sprinkling them with light shower of water;
- Detour will be provided for local traffic movement;
- The vehicles carrying construction materials and the construction material storage areas will be covered with tarpaulin;
- GRM will be implemented in case of complaints from the community;
- The Contractor will coordinate nearby ambulance services for any asthma cases;
- Prior consultation and information sharing with the nearby health facilities;
- There will be pre-arrangement of medical facilities and availability of ambulance in case of asthma cases (reported during medical screening of workers);
- Tyres of all the vehicles leaving the site will be washed. No earth, mud, dust and the like will be deposited on the public road; and
- Construction workers will be provided with masks for protection against the inhalation of dust.

#### **6.5.10 Noise**

##### **Potential Impact**

Noise level is expected to increase during construction activities. Main sources of noise and vibration will be heavy machinery such as excavators and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors located within 500 meters of the project area. Health risks associated with exposure to continuous noise levels include high blood pressure, hypertension, annoyance and sleep disturbance, temporary threshold shift etc. The impacts of noise would be temporary and highly adverse in nature.

##### **Mitigation Measures**

- Construction workers will be provided suitable hearing protection like ear cap, or earmuffs and training them in their use;
- Selection of up-to-date and well-maintained equipment with reduced noise levels will be ensured by suitable in-built damping techniques or appropriate muffling devices;
- No activities will be undertaken at night; and
- Residents will be notified earlier before commencement of excavation operations.

#### **6.5.11 Municipal and Construction Waste/ Wastewater**

##### **Potential Impact**

Due to construction activities municipal and construction waste will be generated. The construction waste will include wastewater, oil spillage from machinery, domestic waste, old sewer & water pipes, sludge in old pipes and construction waste etc.

Improper dumping of waste may generate odor and attract mosquitoes and other disease vectors. Empty containers containing toxic, flammable and corrosive materials may pose

hazard to the workers. This may result in health risk to the work force and public, if disposal site is improperly selected. This impact is temporary and low adverse in nature.

### **Mitigation Measures**

- Approximately 85.5% of the excavated material will be utilized for backfilling. The remaining material will be made available to secondary users if uncontaminated. The Contractor also has the option to share waste with other Contractors. If a project requiring excess material is identified, the Contractor may choose to enter into a Memorandum of Understanding (MoU) with the other Contractor Solid Waste generated during construction and camp site will be safely disposed of in demarcated waste disposal sites i.e., Jam Chakro and the contractor will provide a proper waste management plan;
- Burning of waste will be prohibited;
- Only covered containers to be used; Proper labelling of containers, including the identification and quantity of the contents, hazard contact information etc;
- Emergency Response plan has been prepared to address the accidental spillage of fuels and hazardous goods;
- and
- Training of work force involved in the storage, handling and transportation of hazardous material regarding emergency procedures.

### **6.5.12 Chance of Finding Artifacts**

#### **Potential Impact**

During excavation, there is a chance of finding artifacts. In case of finding any artifact, the contractor will immediately stop the activities and report through Supervision Consultant to Directorate General (DG) of Archeology, Government of Sindh to take further appropriate action to preserve those antiques or sensitive remains. The Chance Finds Procedure (as given in **Annex-XI**) will be adopted in case of any accidental discovery of cultural heritage.

### **6.5.13 Resource Conservation**

#### **Potential Impact**

The materials used in construction of proposed project would include coarse aggregates (crush), fine aggregates (sand), brick ballast, water and cement etc. Almost all the materials to be used in the construction of proposed project are non-renewable and therefore their sustainable use is necessary for the future use. Furthermore, minimal quantities of water will be required for the domestic usage of workers as well as for sprinkling.

Diesel and residual fuel oils will be used to operate construction machinery and equipment. Sustainable use of energy resources is very important not to continue future use but it will also help to reduce air emissions. For conservation of energy, efficiency of the engines and burning processes is very important.

### **Mitigation Measures**

- Reuse of construction waste materials will be considered;
- Unnecessary equipment washings will be avoided;
- The efficient and well-maintained equipment and machinery will be used;
- The equipment and machinery will be turned off when not in use;
- Regular maintenance of machinery to avoid fuel leakages;
- Material from nearby markets will be procured for the efficiency; and
- Resource conservation plan (attached as **Annex-XII**) will be followed.

#### **6.5.14 Biodiversity Conservation**

The project area is not rich in the biodiversity and the effect of proposed construction activities will be insignificant.

#### ***Flora***

### **Potential Impact**

On account of construction of the proposed sewerage system, no trees are envisaged to be cut/disturbed. Hence there will be no direct impact on the flora of project area. However, the dust emissions due to excavation operations will stick on the leaves of existing trees and may close their stomata thus hindering the photosynthesis process. This impact is however temporary and low adverse in nature.

### **Mitigation Measures**

- Plantation of trees in the project area for net environmental improvement;
  - Regular sprinkling of water over the loose stockpiles of soil to avoid dust emissions;
- Campsites will be established on vacant land as far as possible, at least 100 m away from the residential areas;

#### ***Fauna***

### **Potential Impact**

The local animals mostly cats and dogs get disturbed due to construction activities. However, there will be no damage to their health and life. Some reptiles and insects may get killed/injured during excavation operations.

### **Mitigation Measures**

- Excavations will be limited to the approved engineering drawings;
- Harassing of animals will be prohibited.



## 6.5.15 Health and Safety

### A. Occupational Health and Safety

#### Potential Impact

Health risks and workers safety problems may result at the workplace if the working conditions provide an unsafe and/or unfavorable working environment. The health and safety issues are also associated with the operation of construction machinery and equipment, which may cause minor and severe injuries to workers. Accidental contact of workers with underground electrical cables during excavation will also be a major concern. It will be a long term and severe negative impact. Hydrogen sulfide (H<sub>2</sub>S) gas will be present in the old sewers which are mostly clogged. The removal of these pipes will release this poisonous gas and may affect the workers and other people present nearby. This impact will be severe for the people suffering from different respiratory diseases.

Workers might need to work in confined spaces including pipes, sewers etc. because the maximum diameter of the proposed pipe is 42-inches. There may be presence of harmful fumes, vapors, noxious gases, high temperatures etc. This impact is significant and high adverse in nature.

#### Mitigation Measures

- Obligatory insurance against accidents for labourers/workers and implementation of the provisions of Fatal Accidents Act;
- Policy of 'no lone workers' will be followed during the removal of old sewerage lines;
- The site will be declared as 'no-go area' for general public;
- Contractor will designate one of the staff members to act as lead person for emergency response and safety issues;
- Proper lighting arrangements will be ensured for night shift working
- Basic medical training will be provided to specified work staff and basic medical service and supplies to workers;
- Layout plan for camp site will be displayed at site, indicating safety measures taken by the contractor, e.g., firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents will be developed and approved;
- Work safety measures and good workmanship practices will be followed by the contractor including use of PPEs (oxygen masks/ kits etc.);
- Protection devices (ear muffs) will be provided to the workers doing job in the vicinity of high noise generating machines i.e., excavators;
- Suitable Personal Protective Equipment (PPEs) like masks, goggles and gloves etc. will be provided to all workers, particularly those removing old sewer lines carrying sludge and H<sub>2</sub>S gas;
- Elaboration of a contingency planning in case of major accidents;
- Adequate signage, lighting devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads;

- Workers will be provided with adequate shelters, cold drinking water, resting places, and reasonable timely rotation during high temperatures;
- Implementation of Health and Safety Management Plan (**Annex – XIII**).
- Use of safety signs at the construction site, as shown below.



- For working in confined spaces, the possible hazard will be identified and adequate measures will be adopted. (The Contractor has to develop the Standard Operating Procedures for Confined Space Entry).;
- The gases detectors will be used before entering into confined spaces and adequate equipment including face shields, oxygen cylinder kits will be used.
- The Contractor will submit an Occupational Health and Safety Management Plan (OHSMP) which will be reviewed and approved by the PIU.

## **B. Community Health and Safety**

### **Potential Impact**

The construction activities and vehicular movement at construction sites may result in roadside accidents particularly inflicting local communities who are not familiar with presence of heavy equipment. This is a temporary and moderate negative impact. Quality of groundwater and surface water resources available in the nearby local communities may be affected due to the construction activities, oil spillage and leakage, roadside accidents etc. The labors with different transmittable diseases (e.g., COVID-19) may cause spread out of those diseases in the local residents. Open trenches and deep manhole may cause accidents for the local residents. The piling of excavated material and sludge on the site may become breeding ground for disease vector.

### **Mitigation Measures**

- The laborers with different transmittable diseases will be restricted within the construction site. Medical screening will be performed (see Table 7.8);
- Ensure that the site is restricted for the entry of irrelevant people particularly children;
- Create awareness about road safety among the drivers operating construction vehicles;
- Timely public notification on planned construction works;
- Provision of proper safety and diversion signage, particularly at sensitive/accident-prone spots;
- Setting up speed limits in close consultation with the traffic police; and
- Prevention of larval and adult propagation of vectors through sanitary improvements and elimination of breeding habitat and by eliminating any unusable impounding of water;
- During construction work, pedestrian access and alternate vehicular passages will be provided;

- COVID-19 SOPs will be followed at work site and construction camps; and
- Open trenches and deep excavated manholes will be protected by hard barricade to avoid any accident; and
- Provision of adequate lighting at night near open trenches and availability of watch and ward at site.

### **C. Emergency Response (Natural and Man-Made Disasters)**

#### **Potential Impact**

Natural disasters and accidents such as fire, falls, slips and trips may result in injuries, financial losses and may even lead to deaths. The workers will be trained and facilitated to cope with such emergencies.

#### **Mitigation Measures**

- An Emergency Response Plan (**Annex -XIV**) for earthquakes and manmade disasters has been developed by the proponent and will be implemented in close consultation with the Fire Fighting Department, bomb disposal squad and paramedics;
- Training of the staff/employees regarding the emergency procedures/plans will be regularly conducted;
- Emergency numbers will be clearly posted; and
- Minor incidents and near misses will be reported and preventive measures will be formulated accordingly.

### **6.5.16 Traffic Management**

#### **Potential Impact**

Major portion of the alignment of sewer lines is on the main roads where there is heavy movement of traffic. There will be adverse impact on traffic during execution of the project especially near the junctions. People may suffer inconvenience during the morning and evening peak hours. This impact is temporary and high adverse in nature.

#### **Mitigation Measures**

- Public notification through media;
- The construction activities will be carried out in pockets/reaches, once a patch has been completed (i.e., pipes are laid and covered) then excavation on new patch will be started;
- Local community will be taken on board to plan alternate access routes in connecting streets to ensure mobility of local traffic; and
- Contractor will follow the **Traffic Management Plan (Refer section 3.4)**
- Plan work in a minimum possible time.

### **6.5.17 Nuisance/ Disturbance to Social Sensitive Areas (educational, health and religious places)**

#### **Potential Impact**

Since the work is being conducted in urban sensitive areas like schools, hospitals and religious center, the excavation of trenches and sewer laying activity will create nuisance and health hazard to children and people with ailments. This impact is temporary and high adverse in nature.

#### **Mitigation Measures**

- No material will be stocked in this area; material will be brought to the site as and when required;
- No work will be conducted near the religious places during religious congregations;
- Material transport to the site will be scheduled considering school timings;
- Notify concerned schools, hospitals etc. 2 weeks prior to the work; conduct a 30 minutes awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts; and
- Implement all measures suggested elsewhere in this report.

### **6.5.18 Accessibility**

#### **Potential Impact**

Excavation of trenches and sewer laying work in the project area will obstruct access to residences, commercial buildings and businesses adjacent to the proposed project alignment. Disruption of access to commercial establishments may affect livelihood. At some locations, the roads are narrow, construction activities may also obstruct traffic and pedestrian movement. The potential impacts are medium adverse but short-term and temporary.

#### **Mitigation Measures**

- Leave space for access between mounds of excavated soil;
- Consult affected business owners to inform them in advance when work will occur;
- Provide compensation to the loss of business due to restricted access to the PAPs according to ARAP;
- If there are any holidays (i.e., Eid or Muharram etc.), the Contractor will complete the backfilling work of the trenches and will not leave any trench open before holidays;
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints; and
- Rehabilitate the site after completion of work following the Site Rehabilitation Plan (attached as **Annex-XV**)

### **6.5.19 Resilience to Climate Change**

#### **Potential Impact**

There are chances that the open trenches may get flooded during rainy season. Flooding and heat waves can hamper the construction of proposed sewerage scheme. This impact can be categorized as direct, local, medium term, temporary and reversible. Furthermore, rise in temperature will affect the health and efficiency of the workers. Workers may face heat strokes. This impact is high adverse in nature.

#### **Mitigation Measures**

- Project components will be designed to withstand flooding;
- The capacity of the sewerage/ drainage system will be designed and constructed based on extreme weather conditions predicted under international climate change models for Karachi region to cater for extreme storm water runoff;
- The Contractor will adopt Karachi Heatwave Management Plan, A Guide to Planning and Response to mitigate the heat waves impact and provided adequate shelter, cold drinking water and ensure work rotation;
- Adequate resting spaces will be provided to workers in high temperatures; and
- Work shifts will be rotated and there will be provision of cold drinking water.

### **6.5.20 Liquid and Solid Waste from Construction Camps**

#### **Potential Impact**

Development of construction camps will generate significant quantities of liquid and solid waste. Approximately 50 skilled and unskilled staff will be employed for the proposed construction activities.

As a general rule, the water consumption will be about 5 gallon/capita/day and will subsequently generate about 70 to 80% of this water as sewage.

Construction Camps will generate about 0.44 kg/capita/day domestic solid waste comprising kitchen waste, garbage, putrescible waste, rubbish, and small portion of ashes and residues. Improper waste management activities can increase disease transmission, contaminate ground and surface water and ultimate damage to the ecosystem. This impact is medium term, reversible, possible and low adverse.

#### **Mitigation Measures**

To dispose the liquid and solid waste generated from the construction activities, the following steps will be taken by the Contractor:

- The waste generated from the camp site will be disposed of at approved sites by Contractor;

- Construction workers and supervisory staff will be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of the waste;
- Domestic and chemical effluents from the construction camp will be disposed of by the development of on-site sanitation systems i.e., septic tank prior to discharge to nearby drain. Septic tank will be located adjacent to the construction camp. Proper monitoring to check the compliance of SEQs will be carried out. However, this depends on whether the camp will be established by the contractor, and CESMP can provide further elaboration on the situation;
- As per standard engineering practices after digestion of sludge for an extended period, the sludge will be dried and be used for the landfilling at proper location for final disposal;
- All the solid waste from the camps will be properly collected at source by placing containers and disposed of through proper solid waste management (SWM) system. Toxic waste will be handled, stored, transported and disposed separately;
- The waste will be properly sealed in containers with proper labels indicating the nature of the waste; and
- Solid waste will be segregated at source so that it can be re-used or recycled.

#### **6.5.21 Flammable and Hazardous Materials**

##### **Potential Impact**

Flammable materials to be used during the construction activities include diesel, furnace oil, petrol, Liquefied Petroleum Gas (LPG), kerosene oil and machinery fuels. Improper storage and handling practices for these flammable and explosive materials can pose dangers of fire and blasts in the area.

This impact is site-specific, temporary, reversible, possible, and low adverse.

##### **Mitigation Measures**

- Safety procedures will be developed and followed by the contractor and labours strictly while using, handling and storage of these materials. Contractors will be provided instructions about the methods and safe practices of using flammable materials and explosives;
- it will be ensured that contractor's staff will be trained about the procedures of, safe use, handling and storage of materials;

#### **6.5.22 Impacts on Structures**

The alignments have been selected in a manner to avoid any damage to the existing ramps, footsteps and stairs of the shops/houses in the project area. However, there are chances that they may get affected during the construction works due to certain mishaps.

##### **Mitigation Measures**

- Excavation will be restricted to the approved engineering designs;

- Manual excavations will be carried out in narrow streets;
- If by accident, there any damage to any structure, the contractor will reinstate it to its original condition.

#### **6.5.23 Impacts on businesses and livelihood**

None of the business and their sources will be directly affected by the project activities, however, there will be an indirect impact on the livelihood activities, due to restriction in access during the construction stage. This impact will be low adverse and temporary in nature.

##### **Mitigation Measures**

- The provisions of ARP will be implemented in their true spirit;
- The affected persons will be compensated for their losses before commencement of works.

#### **6.5.24 Restrictions of Community Mobility and Access**

The project activities can cause restriction in the mobility and accessibility. This may lead to restriction in access to various facilities including religious, health, and academic facilities etc.

##### **Mitigation Measures**

- The project activities will be implemented in different reaches and all the sites will not be excavated at once;
- There will be alternate routes available for the mobility;
- The excavated trenches will not be left unattended and will be covered immediately after laying of the pipes.

#### **6.5.25 Sexual Exploitation and Abuse (SEA) and Sexual Harasment (SH)**

##### **Potential Impacts**

During construction phase, SEA/SH might arise due to discrimination made against women by unequal work distribution and unequal pay structure among others. Sexual harassment against women might occur as a consequence of mixing of men and women at the construction site, and moving on the roads and markets. This impact is low adverse in nature during construction stage.

##### **Mitigation Measures**

With the effective measures and monitoring, the risk of SEA/SH could be minimized by adopting the following mitigation measures:

- Awareness will be created among the females at individual and community levels about

the construction sites;

- Awareness will be raised in the labor and construction staff on the law of protection against sexual harassment and guidelines will provide to the construction staff on protection against sexual harassment and child labor.
- Workers will not be allowed to crowd in the residential communities within the site;
- Alternative routes for pedestrian will be provided to avoid mixing of women with workers;
- Raise awareness among the communities of the potential risks of GBV, and establish response services in the nearby communities that can respond to instances of SEA/SH (particularly those related to issues of labor influx);
- The Contractor will make sure that no discrimination is made on the basis of gender while hiring of workers;
- Provisions of gender disaggregate bathing, changing, and sanitation facilities; and
- Contractor will take proper measures to address and resolve issues relating to harassment, intimidation, and exploitation, especially in relation to women and men.

### **6.5.26 Influx of Labor**

#### **Potential Impacts**

For the implementation of project activities, skilled and unskilled labor is required by the contractor. Mostly, skilled and unskilled workers have been associated with the contractor since long which they utilize, where they are required for the projects, and while other workers are hired from the different areas that belong to different cultural backgrounds. Social problems and conflicts that are associated with labor Influx are as follows:

- Risk of social conflict: Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources;
- Increased risk of illegitimate behaviour and crime: The influx of workers and service providers into communities may increase the rate of crimes and a perception of insecurity by the local community. Such illegitimate behaviour and crimes can include theft, physical assaults, substance abuse, sexual assault and human trafficking;
- Increased risk of communicable diseases and burden on local health services. The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers, this can result in an additional burden on local health resources.

#### **Mitigation Measures**

- Labour camp(s) will be established away from residential population;
- Preference will be given to the local people to work with contractor, and contractor will hire maximum labour force from the project area because this will reduce the labour influx;
- Awareness will be created among the work force to ensure respect for local customs;



- Construction work will be completed within the stipulated time to move workers to next location;
- Labor force will be shuffled with the time;
- An effective GRM has been established for the project to resolve all issues related to the community. Thus, progress regarding resolving the issues will be monitored closely.
- Create awareness among workers on proper sanitation and hygiene practices to endorse proper health and maintain good housekeeping practices at all project sites;
- Provide adequate personal hygiene facilities in good condition with adequate supply of clean water;
- Make arrangements to treat the affected workers on time to control the movement of vectors disease;
- Sensitize workers and surrounding communities on awareness and prevention of HIV/AIDS and sexually transmitted infections (STI) through training, awareness campaigns and workshops during community meetings;
- Provide proper and free HIV/AIDS and STI health screening and counselling for site workers and community members;
- Enforce a strict code of conduct for workers (attached as **Annex-XIV**) to regulate behaviour in the local communities;
- Prohibiting drugs, alcohol, weapons, and ammunition on the worksite among personnel;
- Site security preparations will be contained within the Bills of Quantities (BOQs) to avoid any delays which might be caused due to insecurity;
- Appropriate fencing, security check points, gates and security guards will be provided at the construction sites to ensure the security of all plant, equipment, machinery and materials, as well as to secure the safety of site staff; and
- The Contractor will guarantee that good relations are maintained with local communities and their leaders to help reduce the risk of vandalism and theft.

### **6.5.27 Social/ Cultural Conflicts**

#### **Potential Impact**

During the construction phase of the project, conflicts may arise between labor force and local community. Use of local resources and products by the construction workers can generate stress on the local biophysical resources. Furthermore, difference in cultural values may also cause discomfort to local residents. This impact is temporary and low adverse in nature.

#### **Mitigation Measures**

- Public notification through media during the entire construction phase to avoid any inconvenience in accessibility to the locals;
- Establishment of formal links with affected communities;
- Plan for social grievance redress mechanisms including the local leaders and community representatives;
- Local labor will preferably be employed for construction works;
- Careful planning and training of work force to minimize disturbance to the local people; and

- Contractor will preferably arrange their own sources of water.

### **6.5.28 Economic Activity**

#### **Potential Impact**

Due to the construction of the proposed Project, economic activity will be generated in the project area as the laborers and semi-skilled staff will have an opportunity to work in the project area. This will provide them an opportunity to develop their skills and capacities. It will also benefit the local vendors of the project area. This is a positive impact.

#### **Mitigation Measures**

- The local labor will be hired and thus creating the chances of livelihood development;
- The local markets will be preferred for procurement of material and machinery

### **6.6 Anticipated Impacts during Operational Phase**

Anticipated impacts during Operational Phase and the recommended mitigation measures have been described under biophysical and socio-economic categories as follows:

#### **6.6.1 Soil**

##### **Potential Impact**

The soil quality may be affected due to leakage/ infiltration from sewer lines. The sludge generated from cleaning/ maintenance of manholes and sewers may contaminate the soil. This is a medium adverse impact.

##### **Mitigation Measures**

- The leakages will be regularly checked and quick maintenance will be done as when required;
- The sludge collected during the cleaning of pipes will be immediately removed and adequately disposed at designated locations.

#### **6.6.2 Hazards due to Blockage of Sewer Lines**

The project has been designed to serve the needs. It can be presumed that blockage would not occur under normal operation conditions. However, it was observed that people generally throw solid waste into sewer lines, resulting into choking of the network. Any blockage in the sewerage network can result in overflows causing nuisance to people, and serious health and sanitation problems during the operation phase. The wastewater may also contaminate soil and groundwater.

### **Mitigation Measures**

- Public awareness program;
- Provision of sufficient O&M staff;
- Provision of sewer cleaning equipment for cleaning the sewers will be included in the project cost;
- Development of a system to register public complaints and urgent clearance of blockages in the system

### **6.6.3 Air Quality**

#### **Potential Impact**

The operation of sewerage scheme will result in generation of gases including H<sub>2</sub>S and CH<sub>4</sub>.

#### **Mitigation Measures**

- Provision of exhaust gas vents at appropriate locations;
- Sewer-men will cover their faces with gas mask while entering the sewer for cleaning or maintenance purposes;
- It's better to use sucking machinery for cleaning of sewers;
- Use gas detector before inspection;
- Mandatory presence of first aid and ambulance during maintenance operations.

### **6.6.4 Solid Waste**

#### **Potential Impact**

Domestic and hazardous wastes would be generated during cleaning and maintenance activities. The solid waste during operational phase will consist of plastics, metal and organic wastes present in sewer lines which can cause blockage to sewerage systems. This impact is high adverse and permanent in nature.

#### **Mitigation Measures**

- Waste will be collected, stored and disposed of according to relevant standards in approved facilities by KW&SC;
- Schedule inspection of the sewer lines to keep it clean and to identify any hazardous material;

### **6.6.5 Sludge**

#### **Potential Impact**

Sludge is semi solid material which will be settled at the bottom of the manholes and sewers due to anaerobic decomposition of biomass. The cleaning of manholes will generate sufficient

amount of sludge. The removed sludge in wet form, if left unattended will create nuisance i.e., odor, soil contamination, groundwater contamination (through percolation/ seepage) and will serve as breeding ground for disease vector. KW&SC performs desludging of the system as preventive and corrective actions based on their standard operating procedures.

### **Mitigation Measures**

- Appropriate sludge treatment will be undertaken before disposal of sludge;
- KWSC has to ensure proper drying of sludge before its disposal;
- International best practices will be followed that involves drying of sludge, testing the quality and all health and safety procedures to be followed by the waste handlers;
- The sludge will never be left unattended and will be transferred to designated dumping site after adequate treatment.

### **6.6.6 Occupational Health and Safety Hazards**

#### **Potential Impact**

OHS impacts are discussed separately for different type of hazards and activities.

#### **Wastewater Handling**

Following occupational hazards are associated with treated wastewater handling:

##### **Infections**

- Infections resulting from direct contact with the sewage during the cleaning of sewers and manholes.

##### **Health effects due to H<sub>2</sub>S Gas**

- The cleaning workers will be exposed to H<sub>2</sub>S gas in the sewers and manholes which may cause mucous membrane effects, skin & eye irritation, nausea, fatigue, coughing, loss of appetite and loss of smell.

### **Mitigation Measures**

The mitigation measures proposed to be adopted are as follows:

- The occupational health and safety (OHS) (**Annex XVII**) plan will be followed;
- Provide basic medical training to the specified work staff and basic medical service and supplies to workers;
- Obligatory insurance of work laborers against accidents;
- Provision of face mask, face shields, gas removal kits etc;
- Provision of safety measures such as emergency sirens, firefighting equipment, first aid, and contingency measures in case of accidents; and
- Management will strictly enforce the recommended SOP to avoiding spreading of coronavirus disease.

## **6.6.7 Community Health Hazards**

### **Potential Impact**

During desludging and cleaning operations the sludge will be piled up temporarily along the manholes and will be a hazard for passers-by and local community. This impact is temporary and medium adverse in nature.

### **Mitigation Measures**

- The sludge will be timely removed from the site and the area will be barricaded during desludging and cleaning periods.

## **6.7 Positive Impacts**

### **6.7.1 Improved Sewerage System**

The proposed project will improve the overall sewerage system of the selected sewerage schemes. Currently, the flooded and stagnant water results in foul odor, serves as breeding ground for disease vector and results in inconvenience to the road users and local community. Hence the project will improve this situation by controlling overflows and proper disposal of wastewater/ storm water.

### **6.7.2 Improvement in Public Health, Hygiene and Sanitation**

With the improvement in sewerage system, improvement in health, hygiene and sanitation will also be observed. The incapacitated sewers will be replaced and sanitation conditions will be improved. Foul odor will be eliminated and there would be no breeding grounds for diseases vectors. Thus, the project will improve public health, hygiene and sanitation conditions in the project area.

### **6.7.3 Change in Land Value**

Upon completion of the proposed sewerage system, the overall environmental conditions of the town will greatly improve due to elimination of stagnate wastewater and overflowing conditions in the streets along with plantation of new trees. This will be a major positive impact of the proposed project enhancing socio-economic conditions of the city residents.

### **6.7.4 Other Positive Impacts**

Some other positive impacts include the following:

- Economic development
- Employment generation

## 6.8 Operational Sustainability

The sewer pipes and other components of the project will not function without maintenance, as silt inevitably collects in areas of low flow over time. Improper operation and maintenance of sewerage system may result in illegal ingress of municipal solid waste into manholes/sewers, deposition of silt/sludge reducing capacity of sewers significantly.

### **Mitigation Measures**

- Routine/ preventative maintenance and desilting will be carried out as with the passage of time depositing silt becomes so hard that the blockage problems are experienced;
- Major causes of deposition of silt and floating matters in the sewers are the mixing of solid waste and smaller diameter sewer pipes. Placement of sufficient number of solid waste litter bins/containers will be ensured along the roads and in streets to avoid entrance of solid waste into sewers;
- Immediate response to all sewer related complaints followed by prompt correction of defective condition;
- Sufficient and properly working desilting machinery/equipment will be made available by KW&SC;
- Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or ex-filtration;
- Any repairs will be conducted by sealing off the affected sewer and pumping the contents into tankers, after which the faulty section will be exposed and repaired following the same basic procedure as when the sewer was built. Trenches will be dug around the faulty section and the leaking joint will be re-sealed, or the pipe will be removed and replaced.

## 6.9 Cumulative Impacts

The project activities will be undertaken within the Area of Influence (CoI). Currently, no development and construction activity are being undertaken within these Schemes, therefore, there will be no cumulative impact of these activities.

## 7 ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING PLAN

### 7.1 General

This section aims to address the measures which need to be adopted during each phase of the project to avoid, contain, mitigate or compensate the potential impacts identified in **Section 6**. Environmental & Social Management Plan (ESMP) is a major part of this section and forms the gist of this study. ESMP not only includes Best Management Practices (BMPs) but also includes Monitoring Indicators, frequency, responsibility and estimated Environmental Budget. This ensures that mitigation, monitoring and management consideration form a part of the documentation used for decision making and the basic benefit of defining the responsibilities is to make sure that the suggested mitigation measure will be implemented at construction and operation stages of the project. A summary of the mitigation measures for potential impacts has also been given in this section to support ESMP. Moreover, the framework for the implementation of ESMP has been discussed in this section.

### 7.2 Objectives of ESMP

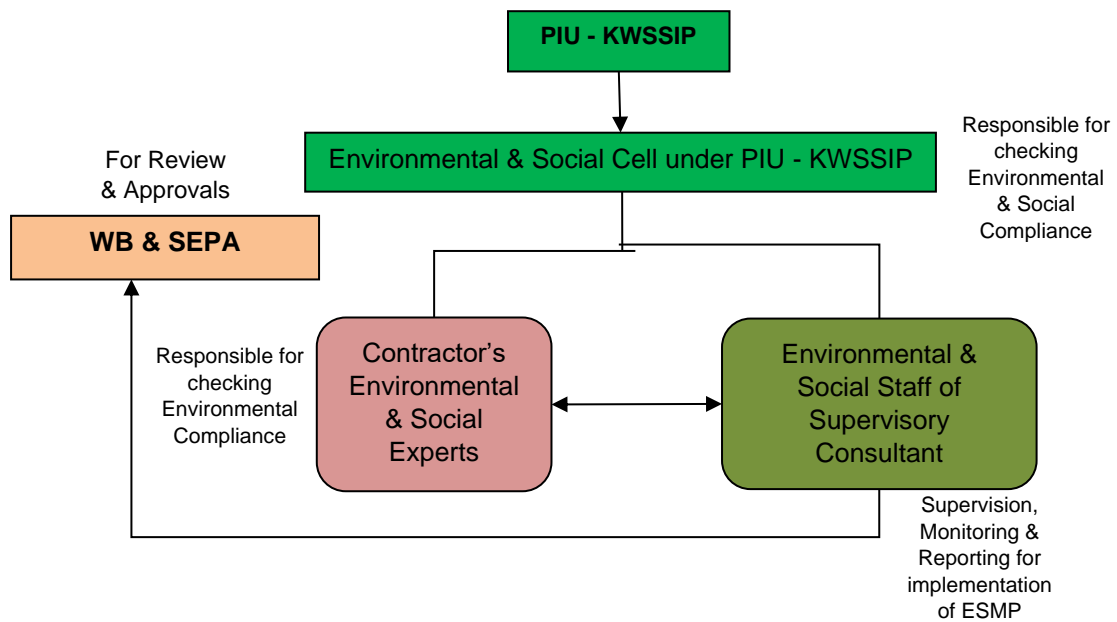
The main objectives of ESMP are to:

- Provide details of the project impacts along with the proposed mitigation measures and the corresponding implementation activities;
- Define the roles and responsibilities of the Project Proponent, Contractor, Supervisory Consultants and other players and effectively communicate environmental issues among them;
- Define a monitoring mechanism, reporting frequency and identify monitoring parameters to ensure that all the mitigation measures are completely and effectively implemented; and identify the resources required to implement the ESMP and outline the corresponding financing arrangements.
- Ensure that the project will adopt COVID 19 best international standard procedures (SOPs) during the construction and operational phases.

### 7.3 Implementation of Environmental & Social Management Plan (ESMP)

The institutional arrangement for the implementation of ESMP for Assignment C of SOP-1 of KWSSIP is presented in **Figure 7.1**. The proponent PIU-KWSSIP will be responsible for the compliance of environmental and social safeguard requirements of the KWSSIP project.

The project activities will be monitored and managed by the PIU-KWSSIP. The qualified environmental, social and gender specialists working under the PIU are currently acting as the Environmental and Social Cell (ESC). The ESC will be the custodian of the ESMP. ESC will support to ensure the compliance of ESMP. ESC will submit a progress report for the implementation of the ESMP to SEPA as per environmental approval/ NOC conditions for the KWSSIP.



**Figure 7. 1: Organizational Setup for implementation of ESMP**

### 7.3.1 Roles and Responsibilities of the Functionaries involved in ESMP Implementation

#### A. World Bank

The current sub-project falls under category B in view of limited environmental and social impacts and thus requires an ESMP. The World Bank will review and approve the safeguard documents including ESMP. The Bank will also review and approve the quarterly and biannually prepared progress reports.

#### B. SEPA

As per Sindh Environmental Protection Act, 2014, SEPA is responsible for environmental protection and pollution control. The SEPA is responsible for the approval of the EIA/ IEE of all the developmental projects under their jurisdiction. As per SEPA (Environmental Assessment) Regulations, 2021, Schedule-II, IEE is required for 'Waste Disposal and Treatment (category H). IEE will be submitted to SEPA and Environmental clearance will be sought before the commencement of workschem. Based on the IEE and ESMP, SEPA will monitor (as and when required) the Project activities.

#### C. Project Director (PIU-KWSSIP)

Project Director of PIU-KWSSIP is the in-charge for the financial and technical matters related to KWSSIP project. His responsibilities for monitoring the ESMP will consist of:

- Ensuring that the required environmental training is provided to the concerned PIU staff;



- To carrying out random site visits to the construction sites to review the environmental performance of the Contractor;
- Review monitoring reports for the progress of environment related activities;
- Make sure that the Contractor is implementing the additional measures suggested by the Supervision Consultant (SC) in environmental monitoring reports;
- To assist Contractor for obtaining necessary approvals from the concerned departments;
- Maintaining interface with the other lined departments/ stakeholders; and
- Reporting to the SEPA on status of ESMP/IEE implementation.

#### **D. Environmental and Social Cell (ESC)**

ESC has already been established in the PIU-KWSSIP which is responsible to:

- Make sure that all the contractual obligations related to the environmental and social /gender compliance are met;
- Monitor the progress regarding implementation of environmental and social safeguards as provided in the ESMP;
- Oversee the compliance of all the monitoring programs as given in ESMP;
- Check randomly whether monitoring of the environmental aspects of the Project during construction and operational phases is being properly carried out;
- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports, and make follow-up on these actions to ensure progress toward the desired outcomes;
- Make sure that the Contractor implements the additional measures suggested by the M&E Contractor; and
- Report the status of ESMP compliance to Project Director, PIU-KWSSIP.

#### **E. Supervisory Consultant (SC)**

Roles and responsibilities of SC will be:

- To ensure that one Environmental and one Social Safeguards Officer is hired for overseeing the day-do-day E&S compliance issues on site. The Environmental and Social Safeguards Officers must have extensive working experience in Karachi and must be approved by the E&S Specialists of PIU-KWSSIP before procurement by the SC;
- If the site situation requires based on mutual consensus between PIU-KWSSIP and SC, additional support staff, such as Male and Female Community Mobilizers will be hired to ensure appropriate community engagement and GRM;
- To closely monitor, oversee and report on the performance of the Contractor in line with the requirements set out in the ESMP;
- Ensuring that the day-to-day construction activities are carried out in line with all the E&S compliance protocols and guidelines that meet local as well as WB requirements;
- Ensure periodic consultations are carried out with nearby communities, especially women and vulnerable groups to solicit their feedback and grievances, if any, especially prior to, during and after major construction activities.

- Consultation team of SC must be sensitized to the community issues and concerns and maintain a close liaison with the Community Representatives. Periodic reporting on consultation activities must be reflected in the SC's Monthly E&S Report.
- Strong coordination with the Contractor and PIU-KWSSIP;
- Preparing training materials and implementing programs for the Contractors staff working at all levels to ensure E&S Compliance, including but not limited to Incident Reporting, Tool Box Talks, GRM, GBV/SH, First Aid, and all HSE and OSH aspects relevant to the project site
- Reporting to the PIU-KWSSIP within 24 hours in case of any major injury/fatality on site
- Ensure the implementation of the mitigation measures suggested in ESMP;
- To supervise and monitor environmental and social performance activities being performed at site and report to the PIU-KWSSIP in an approved monitoring format
- Periodic reporting as mentioned in ESMP; and
- Suggest any additional mitigation measures (if required).

#### **F. Construction Contractor (CC)**

Contractors will be bound to appoint competent environmental and social compliance officers with relevant educational background and experience throughout the implementation of the project. The E&S team of the Contractors will be screened and recommended by the SC and approved by the Environmental and Social Specialists of the PIU-KWSSIP. Contractors' Environmental and Social manager will carry out following activities:

- Implementation of the mitigation measures at construction site;
- Contractor will be bound through contract to take actions against all the special and general provisions of the contract document;
- Contractor will make sure the compliance of ESMP recommendations related with construction and will also be responsible for effective liaison with stakeholders;
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use;
- Provision of hard barricades, first aid kits, complaint boxes, incident forms, banners related to project information and health and safety to the satisfaction of the SC
- Compliance with international best SOPs for COVID 19;
- To conduct the environmental and health & safety trainings to the workers/labour with support of the SC and
- Coordinate with Environmental Specialist and Social Development Specialist (SDS) of SC.

In addition to above, the CC will also follow the Environmental Code of Practice (ECOPs) attached as **Annex-XVII**.

### 7.3.2 Institutional Arrangement for Implementation of ESMP by KW&SC during O&M Phase

The proposed Project will be administrated by KW&SC during the O&M phase. The Project Director, KWSSIP with his ESC will be responsible for the following:

- Compliance of ESMP requirements for O&M phase;
- Coordinating with the operational staff working under the ESC to monitor environmental compliance during project operation;
- Advising on, and monitoring tree plantations along the buffer zone of project area;
- Reporting on the progress of environmental compliance to the SEPA;
- Assessing the long-term environmental impacts of project operation;
- Sustaining a working partnership among the PIU-KWSSIP, KMC, SEPA, Agriculture, Irrigation, Forest and Wildlife departments of Sindh, NGOs and other related public private sector organizations; and
- Reporting to Managing Director (MD) KW&SC about progress of the work.

### 7.4 Reporting

The contractor will prepare and submit weekly monitoring reports for compliance of implementation to supervision consultant environmental team.

Construction Supervision Consultant will prepare monthly & quarterly reports and submit to the PIU-KWSSIP, and annual monitoring reports as well as a final report of the sub-project based on implementation status. The distribution of periodic reports is given in **Table 7.1**.

**Table 7. 1: Distribution of Periodic Reports**

Report	Prepared by	Reviewed by	Distribution
Daily	Contractor	Reviewed by CSC	The Engineer and E&S Cell Project Implementation Unit
Weekly	Contractor	Reviewed by CSC	The Engineer and E&S Cell Project Implementation Unit
Monthly	SC	Reviewed by PIU- Environmental Unit; KWSSIP	The Engineer and Project Implementation Unit
Quarterly	SC	Reviewed by PIU- Environmental Unit; KWSSIP	The Engineer, Project Implementation Unit and The World Bank
Final	SC	Reviewed by PIU- KWSSIP-Environmental Unit; KWSSIP	The Engineer, Project Implementation Unit and The World Bank

### 7.5 Non-Compliance of the ESMP

The implementation of the proposed ESMP involves input from various functionaries as discussed earlier. The contractor will be primarily responsible for ensuring implementation of the mitigation measures proposed in the ESMP, which will be part of the contract documents.

The provision of the environmental mitigation cost will be made in the total cost of project. However, if the contractor fails to comply with the implementation of ESMP and submission of the monthly compliance reports, following actions will be taken by the SC:

- Deductions will be made from the payments to the Contractor claimed under the heads of environmental and other relevant components;
- Imposition of penalties;
- Suspension of services.

## **7.6 Contractor's ESMP**

The contractor will prepare a site specific ESMP based on the current ESMP and will get it approved from PIU-KWSSIP and WB. This will ensure the implementation of the ESMP based on the site conditions at the time of execution, by the contractor.

## **7.7 Inclusion of ESMP in Bidding/ Contract Documents**

The present ESMP will be included in the bidding/ contract documents and their implementation will be a contractual binding for the contractors.

## **7.8 Environmental and Social Monitoring Plan**

Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at three levels. At the PIU level, the ESC will do ESMP monitoring to ensure that the mitigation plans are being effectively implemented. The environmental engineer of Supervision Consultant will regularly monitor the ESMP implementation by the contractor. At contractor's level, the environmental monitoring checklist will be filled on daily basis by their environmental manager and countersigned by environmental engineer of Supervision Consultant.

**Table 7.2** outlines the parameters that will be monitored, expected frequencies of monitoring and responsible agency for monitoring. The Environmental Monitoring checklist is attached as **Annex – XVIII**. The environmental monitoring checklist may be developed on Kobo Toolbox and data and environmental monitoring data may be managed accordingly.

**Table 7. 2: Environmental & Social Monitoring Plan**

Parameter	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implementation	Supervision
<b>Construction Phase (12 Months)</b>					
Surface water/Wastewater quality	At the disposal point of Lyari River	Sampling and analysis of drain water according to SEQS	Quarterly	CC	EE of SC ESC of PIU- KWSSIP
Groundwater quality	Two points, within project boundary	Sampling and analysis of groundwater for all the parameters as given in SEQS	Quarterly	CC	EE of SC ESC of PIU- KWSSIP
Air Quality (Dust, smoke)	Along the access roads and at project site	Visual inspection to ensure good standard equipment is in use and dust suppression measures (sprinkling) are in place	Daily	CC	EE of SC ESC of PIU- KWSSIP
	Along the access road	Visual inspection to ensure dust suppression work plan is being implemented	Daily	CC	EE of SC ESC of PIU- KWSSIP
Air Quality (PM <sub>10</sub> , NO <sub>2</sub> , SO <sub>2</sub> , CO <sub>2</sub> , CO)	One point at active project site.	Air quality monitoring for 24hours for the parameters specified in SEQS	Quarterly	CC	EE of SC ESC of PIU- KWSSIP
Smoke from construction machinery	Close to construction area	Visual inspection for the color of the smoke	Daily	CC	EE of SC ESC of PIU- KWSSIP
Noise and vibration	One point at project site.	24hour noise monitoring through EPA certified laboratory	Quarterly	CC	EE of SC ESC of PIU- KWSSIP
	Close to noise generating equipment and road	Field observation	Daily	CC	EE of SC ESC of PIU- KWSSIP
Waste Management	Storage and camp area	Visual inspection that solid waste is disposed of at designated sites	Weekly	CC	EE of SC

Parameter	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implementation	Supervision
					ESC of PIU-KWSSIP
Soil	At the project site and at parking of machinery and material storage points	Visual inspection for leaks and spills	Daily	CC	EE of SC ESC of PIU-KWSSIP
	At the project site	pH, Organic Matter, Electrical conductivity, Phosphorous, Potassium, Saturation Percentage, Soil Texture	Once	CC	EE of SC ESC of PIU-KWSSIP
Drinking water and sanitation	At construction camps	Visual inspection	Quarterly	CC	EE of SC ESC of PIU-KWSSIP
Erosion	---	Visual inspection	Weekly	CC	EE of SC ESC of PIU-KWSSIP
Reinstatement of work sites	---	Visual inspection	After completion of all works	CC	EE of SC ESC of PIU-KWSSIP
Safety of workers	At active construction sites	Visual inspection to ensure use of PPE by workers	Daily	CC	EE of SC ESC of PIU-KWSSIP
Provision of PPEs	At active construction sites	Visual Inspection PPE inventories	Daily	CC	EE of SC ESC of PIU-KWSSIP
Labor Management	At construction camps	Child labour, employment conditions, workers accommodation, Housekeeping, HIV/STDs etc.	Daily	CC	EE of SC ESC of PIU-KWSSIP

Parameter	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implementation	Supervision
Labor Influx	At construction camps	Conflicts related to labour influx	Daily	CC	EE of SC ESC of PIU- KWSSIP
Loss of Structures	Project Site	Visual Observations, Complaints through GRM	Daily	CC	EE & SC
Loss of Businesses and Livelihood	Project Site	Visual Observations, Complaints through GRM	Daily	CC	EE & SC
Access and Mobility Restrictions	Project Site	Visual Observations, Complaints through GRM	Daily	CC	EE & SC
Grievances Redressal	At construction camps	Type and number of grievances Availability of GRM information banner, box and register at the field site and availability of designated GRM focal points.	Daily	CC	GRC
Community/ Occupational Health & Safety	At construction camps	Type and number of accidents	Daily	CC	EE of SC ESC of PIU- KWSSIP
SEA/SH	At construction camps	Number of incidents of men and women harassment	Daily	CC	EE of SC ESC of PIU- KWSSIP
Training	At construction camps	Community/occupational health and safety and Gender in-equalities	Once during construction period	CC	EE of SC ESC of PIU- KWSSIP
<b>Operation Phase (1st Years)</b>					
Ground Water Quality	Two points	Sampling and analysis of water quality for all the parameters as per SEQS	Biannually	ESC of PIU- KWSSIP	SEPA
Air Quality	At the project Site	Air quality monitoring for 24hours for the parameters specified in SEQS	Annually	ESC of PIU- KWSSIP	SEPA

Parameter	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implementation	Supervision
Noise and vibration	At project site	24-hour noise monitoring through EPA certified laboratory	Annually	ESC of PIU-KWSSIP	SEPA
Wastewater	Two points	Sampling and analysis of water quality for all the parameters as per SEQs	Biannually	ESC of PIU-KWSSIP	SEPA
Soil Quality	At the project Site	Soil testing for pH, Organic Matter, Electrical conductivity, Phosphorous, Potassium, Saturation Percentage, Soil Texture	Quarterly	ESC of PIU-KWSSIP	SEPA
Solid Waste	At the project Site	Physical and Chemical Analysis of solid waste	During maintenance	ESC of PIU-KWSSIP	SEPA
Leachate Quality	At the project Site	Laboratory analysis	Quarterly	ESC of PIU-KWSSIP	SEPA
Gas emissions from treatment facility	At the project site	Field observation	Daily	ESC of PIU-KWSSIP	SEPA
Smoke/ emissions from vehicles	Close to operation area	Visual inspection for the color of the smoke	Daily	ESC of PIU-KWSSIP	SEPA
Fire Safety System	At the project site	Visual inspection of the fire extinguishers and other associated equipment	Daily	ESC of PIU-KWSSIP	SEPA
Tree Plantation	At the location as given in plantation plan	Field observation	Daily	ESC of PIU-KWSSIP	SEPA
Safety of workers	At the project site	Visual inspection to ensure use of PPE by workers	Daily	ESC of PIU-KWSSIP	SEPA
Labour Management Procedure	At the project site	Child labour, employment conditions, workers accommodation, housekeeping, HIV/STDs etc.	Daily	ESC of PIU-KWSSIP	SEPA



Parameter	Location	Means of Monitoring	Frequency	Responsible Agency	
				Implementation	Supervision
Training	At the project site	Community/ occupation health & safety	Biannually	ESC of PIU-KWSSIP	SEPA
Grievances Redressal	At the project site	Type and number of grievances	Daily	GRC	SEPA
Gender Based Violence	At the project site	Number of incidents of gender inequality	Daily	ESC of PIU-KWSSIP	SEPA

## 7.9 Environmental and Social Management Plan

The impacts and mitigation measures are discussed in **Table 7.3** below:

**Table 7. 3: Environmental and Social Mitigation Plan**

Sr. No.	Parameters	Target	Mitigation	Responsibility
<b>Design/ Pre-Construction Phase</b>				
1.	Layout Planning & Design	To ensure safe and efficient functioning of the facility	<ul style="list-style-type: none"> <li>All structural, layout and engineering design of the project are in strict accordance with the applicable standards</li> </ul>	DC, PIU-KWSSIP
2.	Selection of Poor Construction Material	To ensure safe health and hygiene problems in service area.	<ul style="list-style-type: none"> <li>Public health problems will be overcome by appropriate selection of the locally available construction material, which is safe for human use, and choice of pipe material and sizes satisfying the requirement of the area.</li> </ul>	DC, PIU-KWSSIP
3.	Environmentally Responsive Design Considerations	To ensure good efficiency along with the compliance of Environmental limits/ Standards.	<ul style="list-style-type: none"> <li>The sewer line has been designed considering the future population and waste generation rate;</li> <li>Sewers will be laid away from water supply lines (at least 1 m, wherever possible);</li> <li>In this case, the sewer lines will be laid below water pipeline (the difference between top of the sewer and bottom of water pipeline will be at least 300 mm);</li> <li>Designed manhole covers to withstand anticipated loads &amp;</li> </ul>	DC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
			<p>ensure that the covers can be readily replaced if broken to minimize silt/ garbage entry;</p> <ul style="list-style-type: none"> <li>▪ Ensured sufficient hydraulic capacity to accommodate peak flows &amp; adequate slope in gravity mains to ensure self-cleansing velocity in order prevent built up of solids and hydrogen sulfide and methane generation.</li> <li>▪ As an anti-theft measure, large manhole covers around 3 feet in diameter have been proposed. The proposed manhole covers are heavy in weight and cannot be lifted easily, without machinery;</li> </ul>	
4.	Groundwater	To avoid contamination of groundwater	<ul style="list-style-type: none"> <li>▪ The seepage control measures have been included in the design which include protective coatings (i.e., bitumen and epoxy) in the internal and external layers of the pipes;</li> <li>▪ Procedure for efficient jointing of selected sewer pipes will be adopted to avoid leakage from pipes.</li> </ul>	DC, PIU-KWSSIP
5.	Surface Water	To avoid contamination of surface water by providing proper treatment to the sewage approaching from different Katchi Abadis.	<ul style="list-style-type: none"> <li>▪ The collected sewage from the project area is planned to be disposed of into Layari Interceptor which ultimately connects to TP-3. The sewage will first be adequately treated and then discharged into the Layari River.</li> </ul>	DC, PIU-KWSSIP
6.	Seismic Hazard	To keep the structures safe and intact in case of earthquakes.	<ul style="list-style-type: none"> <li>• The components of the proposed project include laying of underground sewer lines have been designed to withstand moderate earthquakes; and</li> <li>• To mitigate the seismic hazard, Seismic Building Code of Pakistan 2007 (SBC-07) has been adopted in design of manholes.</li> </ul>	DC, PIU-KWSSIP
7.	Public Utilities	To avoid any kind of disturbance to locals.	<ul style="list-style-type: none"> <li>• Careful selection of the sewer alignment has been adopted to minimize disturbance to public utilities;</li> <li>• Construction contractor will be directed to prepare a</li> </ul>	DC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
			contingency plan to include actions to be done in case of unintentional interruption of services. A sanitation plan ( <b>Annex-X</b> ) will be adopted in design phase to avoid sanitation related issues.	
8.	Physical Cultural Resources	To conserve physical and cultural resources in the project area.	<ul style="list-style-type: none"> <li>The access to physical and cultural resources will not be affected and alternate access route will be provided in case the access has to be restricted during execution period; and</li> </ul>	DC, PIU-KWSSIP
9.	Ecology	To minimize the impact on flora due to project activities	<ul style="list-style-type: none"> <li>The construction camps will be established where minimum or no vegetation exists;</li> <li>A tree plantation plan will be implemented for environmental improvement in the project area.</li> </ul>	DC, PIU-KWSSIP
	A. Flora			
10.	Fire Fighting System	To combat fire hazard.	<ul style="list-style-type: none"> <li>Contractor will provide firefighting system for construction camp, workshop and construction site; and</li> <li>A separate fire alarm system will also be installed at construction camp and near the construction site.</li> </ul>	DC, PIU-KWSSIP
11.	Socio-economic Environment	To resolve the issues raised in consultation with stakeholders	<ul style="list-style-type: none"> <li>All the project stakeholders have been taken on board through effective consultation process and their issues have been addressed in the project design.</li> </ul>	DC, PIU-KWSSIP
12.	Urban Flooding	To prepare the project in view of expected urban flooding	<ul style="list-style-type: none"> <li>None of the construction activities will be undertaken during the monsoon/ rainy season;</li> <li>All the open trenches/ pits will be covered/ backfilled before the rain;</li> <li>Weather forecast will be studied before commencement of major activities;</li> <li>The proposed sewerage system will have the capacity to accommodate a portion of stormwater.</li> </ul>	DC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
<b>Construction Phase</b>				
1.	Topography	To avoid. Minimize/ rectify changes in the topography	<ul style="list-style-type: none"> <li>▪ Material stockpiles will be removed as soon as work is completed, and the area will be re-landscaped;</li> <li>▪ The stockpiles will be covered with tarpaulin sheets or other adequate material;</li> <li>▪ The excavated material including old sewer lines, existing sludge and other mucking material will finally be disposed of in the identified site near Jam Chakro.</li> </ul>	CC, SC, PIU-KWSSIP
2.	Soil Erosion	To avoid degradation of soil.	<ul style="list-style-type: none"> <li>▪ Use of heavy machinery will be restricted as far as possible;</li> <li>▪ Confining excavations to the specified spots as per the approved engineering drawings.</li> </ul>	CC, SC, PIU-KWSSIP
3.	Soil Contamination	To avoid Contamination of soil.	<ul style="list-style-type: none"> <li>▪ Regularly remove all construction wastes from the site to approved waste disposal sites;</li> <li>▪ Awareness in emergency spill response procedures will be conducted;</li> <li>▪ Oil leakages, chemicals and other liquids spills will be avoided/ minimized by providing appropriate storage places depending on the type of material for storage;</li> <li>▪ The vehicles/ dumping trucks will be lined up before digging out the old sewer. The sludge will be removed in presence of the dedicated staff, will be put it in the specialized vehicles and taken for the disposal.</li> <li>▪ During removal of sludge or sewer pipe, proper use of PPEs and gas masks will be ensured;</li> </ul>	CC, SC, PIU-KWSSIP
4.	Trench Failure	To avoid trench failure	<ul style="list-style-type: none"> <li>▪ Provision of adequate shuttering in the trenches;</li> <li>▪ Leftover shuttering may also be used in case of loose soil strata.</li> </ul>	CC, SC, PIU-KWSSIP
5.	Disposal/ Removal of Old Clogged Sewer Pipes	To avoid issues related to handling, storage and	<ul style="list-style-type: none"> <li>▪ Sludge will be covered to avoid nuisance;</li> <li>▪ Sludge will be removed immediately and disposed of at suitable site as per best engineering practice including all the</li> </ul>	CC, SC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
		dumping of old sewer and water lines	<p>health &amp; safety measures to be followed for the waste handlers and drying the sludge. The disposal arrangement will be finalized by the Contractor;</p> <ul style="list-style-type: none"> <li>▪ The vehicles/ dumping trucks will be lined up before digging out the old sewer. The sludge will be removed in presence of the dedicated staff, will be put it in the specialized vehicles and taken for the disposal.</li> </ul>	
6.	Construction Camps / Camp Sites	To avoid construction camp related issues	<ul style="list-style-type: none"> <li>▪ Contractor will select the camp site keeping in view the possible environmental and social issues with the approval of PIU and relevant authorities;</li> <li>▪ Construction camps will be established away from populated areas.</li> <li>▪ Workers Grievance Redress Mechanism will be fully implemented and active so that locals may lodge complaint and are addressed on time.</li> </ul>	CC, SC, PIU-KWSSIP
7.	Storage of Construction Material		<ul style="list-style-type: none"> <li>▪ Sequencing of activities so that only controlled amount of construction material is stocked near work area;</li> <li>▪ Contractor will submit the construction schedule to concerned department in advance;</li> <li>▪ Providing residents with advance warning of construction activities.</li> </ul>	
8.	Air Quality	To avoid air pollution	<ul style="list-style-type: none"> <li>▪ All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained to minimize the exhaust emissions;</li> <li>▪ Open burning of solid waste from the contractor's camps will be strictly banned;</li> <li>▪ SEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works.</li> </ul>	CC, SC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
			<ul style="list-style-type: none"> <li>▪ Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s);</li> <li>▪ Excavated trenches will be restored immediately to original level and paved after laying of sewer pipes.</li> <li>▪ GRM will be implemented in case of complaints from the community;</li> <li>▪ The Contractor will coordinate nearby ambulance services for any asthma cases;</li> <li>▪ Prior consultation and information sharing with the nearby health facilities;</li> <li>▪ There will be pre-arrangement of medical facilities and availability of ambulance in case of asthma cases (reported during medical screening of workers);</li> <li>▪ Tyres of all the vehicles leaving the site will be washed. No earth, mud, dust and the like will be deposited on the public road; and</li> <li>▪ Construction workers will be provided with masks for protection against the inhalation of dust.</li> </ul>	
9	Noise	To avoid noise pollution	<ul style="list-style-type: none"> <li>▪ Construction workers will be provided suitable hearing protection like ear cap, or earmuffs and training them in their use;</li> <li>▪ Selection of up-to-date and well-maintained equipment with reduced noise levels will be ensured by suitable in-built damping techniques or appropriate muffling devices;</li> <li>▪ No activities will be undertaken at night; and</li> <li>▪ Residents will be notified earlier before commencement of excavation operations.</li> </ul>	CC, SC, PIU-KWSSIP
10	Municipal and Construction Waste/ Wastewater	To avoid/ minimize nuisance and environmental pollution in	<ul style="list-style-type: none"> <li>▪ Around 85.5% of excavated material will be used for back filling. The remaining will be donated / sold to secondary users if not found contaminated.</li> </ul>	CC, SC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
		the project area due to liquid and solid waste	<ul style="list-style-type: none"> <li>▪ Solid Waste generated during construction and camp sites will be safely disposed of in demarcated waste disposal sites i.e Jam Chakro;</li> <li>▪ Burning of waste will be prohibited; and</li> <li>▪ Only covered containers to be used; Proper labelling of containers, including the identification and quantity of the contents, hazard contact information etc;</li> </ul>	
11	Resource Conservation	To conserve the natural resources	<ul style="list-style-type: none"> <li>▪ Reuse of construction waste materials will be considered;</li> <li>▪ The efficient and well-maintained equipment and machinery will be used;</li> <li>▪ The equipment and machinery will be turned off when not in use;</li> <li>▪ Regular maintenance of machinery to avoid fuel leakages;</li> <li>▪ Material from nearby markets will be procured for the 12efficiency; and</li> <li>▪ Resource conservation plan (attached as <b>Annex-XII</b>) will be followed.</li> </ul>	CC, SC, PIU-KWSSIP
12	Biodiversity Conservation	To minimize the impact on flora due to project activities	<ul style="list-style-type: none"> <li>▪ Plantation of trees in the project area for net environmental improvement;</li> <li>▪ Regular sprinkling of water over the loose stockpiles of soil to avoid dust emissions;</li> <li>▪ Campsites will be established on vacant land as far as possible, at least 100 m away from the residential areas;</li> <li>▪ Harassing of animals will be prohibited.</li> </ul>	CC, SC, PIU-KWSSIP
	A. Flora	To minimize the impact on fauna due to project activities		
13	Health and Safety	To minimize health risks to workers due to project activities	<ul style="list-style-type: none"> <li>▪ Obligatory insurance against accidents for labourers/workers and implementation of the provisions of Fatal Accidents Act;</li> <li>▪ Policy of 'no lone workers' will be followed during the removal of old sewerage lines;</li> <li>▪ The site will be declared as 'no-go area' for general public;</li> <li>▪ Proper lighting arrangements will be ensured for night shift</li> </ul>	CC, SC, PIU-KWSSIP
	A. Occupational Health and Safety			

Sr. No.	Parameters	Target	Mitigation	Responsibility
			<p>working</p> <ul style="list-style-type: none"> <li>▪ Basic medical training will be provided to specified work staff and basic medical service and supplies to workers;</li> <li>▪ Suitable Personal Protective Equipment (PPEs) like masks, goggles and gloves etc. will be provided to all workers particularly those removing old sewer lines carrying sludge and H<sub>2</sub>S gas.</li> </ul>	
	B. Community Health and Safety	To minimize health risks to public due to project activities.	<ul style="list-style-type: none"> <li>▪ The laborers with different transmittable diseases will be restricted within the construction site;</li> <li>▪ Ensure that the site is restricted for the entry of irrelevant people particularly children;</li> <li>▪ Create awareness about road safety among the drivers operating construction vehicles;</li> <li>▪ Timely public notification on planned construction works;</li> <li>▪ Provision of proper safety and diversion signage, particularly at sensitive/accident-prone spots;</li> <li>▪ Open trenches and deep excavated manholes will be protected by hard barricade to avoid any accident; and</li> <li>▪ Provision of adequate lighting at night near open trenches and availability of watch and ward at site.</li> </ul>	
	C. Emergency Response (Natural and Man-Made Disasters)	To eliminate/ minimize natural and man-made hazards	<ul style="list-style-type: none"> <li>▪ An Emergency Response Plan (<b>Annex -XIV</b>) for earthquakes and manmade disasters has been developed by the proponent and will be implemented in close consultation with the Fire Fighting Department, bomb disposal squad and paramedics;</li> <li>▪ Training of the staff/employees regarding the emergency procedures/plans will be regularly conducted; and</li> <li>▪ Minor incidents and near misses will be reported and preventive measures will be formulated accordingly.</li> </ul>	



Sr. No.	Parameters	Target	Mitigation	Responsibility
14.	Traffic Management	To avoid traffic congestion issues	<ul style="list-style-type: none"> <li>▪ The construction activities will be carried out in pockets/reaches, once a patch has been completed (i.e., pipes are laid and covered) then excavation on new patch will be started;</li> <li>▪ Local community will be taken on board to plan alternate access routes in connecting streets to ensure mobility of local traffic; and</li> <li>▪ Contractor will follow the Traffic Management Plan (see <b>Section 3.5</b>)</li> </ul>	CC, SC, PIU-KWSSIP
15..	Nuisance/ Disturbance to Social Sensitive Areas (educational, health and religious places)	To protect the sensitive areas from the adverse effects of construction activities	<ul style="list-style-type: none"> <li>▪ No work will be conducted near the religious places during religious congregations;</li> <li>▪ Notify concerned schools, hospitals etc. 2 weeks prior to the work; conduct a 30 minutes awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts.</li> </ul>	CC, SC, PIU-KWSSIP
16.	Accessibility	To avoid any inconvenience in accessibility	<ul style="list-style-type: none"> <li>▪ Leave space for access between mounds of excavated soil;</li> <li>▪ Consult affected business owners to inform them in advance when work will occur;</li> <li>▪ Provide compensation to the loss of business due to restricted access to the PAPs according to ARP;</li> <li>▪ If there are any holidays (i.e., Eid or Muharram etc.), the Contractor will complete the backfilling work of the trenches and will not leave any trench open before holidays;</li> <li>▪ Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints; and</li> <li>▪ Rehabilitate the site after completion of work following the Site Rehabilitation Plan (attached as <b>Annex-XV</b>)</li> </ul>	CC, SC, PIU-KWSSIP

<b>Sr. No.</b>	<b>Parameters</b>	<b>Target</b>	<b>Mitigation</b>	<b>Responsibility</b>
16.	Resilience to Climate Change	To minimize production of pollutants contributing in climate change	<ul style="list-style-type: none"> <li>▪ Project components will be designed to withstand flooding;</li> <li>▪ Adequate resting spaces will be provided to workers in high temperatures; and</li> <li>▪ Work shifts will be rotated and there will be provision of cold drinking water.</li> </ul>	CC, SC, PIU-KWSSIP
17.	Liquid and Solid Waste from Construction Camps	To avoid nuisance due to liquid and solid construction waste	<ul style="list-style-type: none"> <li>▪ The waste generated from the camp site will be disposed of at approved sites by Contractor;</li> <li>▪ As per standard engineering practices after digestion of sludge for an extended period, the sludge will be dried and be used for the landfilling at proper location for final disposal;</li> <li>▪ All the solid waste from the camps will be properly collected at source by placing containers and disposed of through proper solid waste management (SWM) system. Toxic waste will be handled, stored, transported and disposed separately; and</li> <li>▪ Solid waste will be segregated at source so that it can be re-used or recycled.</li> </ul>	CC, SC, PIU-KWSSIP
18.	Flammable and Hazardous Materials	To avoid impacts of flammable and hazardous materials	<ul style="list-style-type: none"> <li>▪ Safety procedures will be developed and followed by the contractor and labours strictly while using, handling and storage of these materials. Contractors will be provided instructions about the methods and safe practices of using flammable materials and explosives;</li> <li>▪ It will be ensured that contractor's staff will be trained about the procedures of blasting, safe use, handling and storage of materials;</li> </ul>	CC, SC, PIU-KWSSIP
19.	Sexual Exploitation and Abuse (SEA) and Sexual Harasment (SH)	To avoid GBV related issues	<ul style="list-style-type: none"> <li>• Awareness will be created among the females at individual and community levels about the construction sites;</li> <li>• Awareness will be raised in the labor and construction staff on the law of protection against sexual harassment and guidelines will provide to the construction staff on protection</li> </ul>	CC, SC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
			<p>against sexual harassment and child labor.</p> <ul style="list-style-type: none"> <li>▪ Raise awareness among the communities of the potential risks of GBV, and establish response services in the nearby communities that can respond to instances of SEA/SH (particularly those related to issues of labor influx);</li> <li>▪ The Contractor will make sure that no discrimination is made on the basis of gender while hiring of workers;</li> <li>▪ Contractor will take proper measures to address and resolve issues relating to harassment, intimidation, and exploitation, especially in relation to women and men</li> </ul>	
20.	Influx of Labor	To avoid impacts due to influx of labor	<ul style="list-style-type: none"> <li>▪ Labour camp(s) will be established away from residential population;</li> <li>▪ Preference will be given to the local people to work with contractor, and contractor will hire maximum labour force from the project area because this will reduce the labour influx;</li> <li>▪ Labor force will be shuffled with the time;</li> <li>▪ An effective GRM has been established for the project to resolve all issues related to the community.</li> <li>▪ Enforce a strict code of conduct for workers (attached as <b>Annex-XVI</b>) to regulate behaviour in the local communities;</li> <li>▪ Prohibiting drugs, alcohol, weapons, and ammunition on the worksite among personnel;</li> <li>▪ Implementation of Labor Management Plan attached as <b>Annex – XX</b>.</li> </ul>	CC, SC, PIU-KWSSIP
21.	Social/ Cultural Conflicts	To reduce social Issues	<ul style="list-style-type: none"> <li>▪ Establishment of formal links with affected communities;</li> <li>▪ Plan for social grievance redress mechanisms including the local leaders and community representatives;</li> <li>▪ Local labor will preferably be employed for construction works;</li> </ul>	CC, SC, PIU-KWSSIP

Sr. No.	Parameters	Target	Mitigation	Responsibility
			<ul style="list-style-type: none"> <li>Contractor will preferably arrange their own sources of water.</li> </ul>	
22.	Economic Activity	To ensure economic sustainability of the people of project area	<ul style="list-style-type: none"> <li>The local labor will be hired and thus creating the chances of livelihood development;</li> <li>The local markets will be preferred for procurement of material and machinery</li> </ul>	CC, SC, PIU-KWSSIP
<b>Operation Phase</b>				
1.	Soil	To avoid erosion and contamination of soil	<ul style="list-style-type: none"> <li>The leakages will be regularly checked and quick maintenance will be done as when required;</li> <li>The sludge collected during the cleaning of pipes will be immediately removed and adequately disposed at designated locations.</li> </ul>	KW&SC
2.	Hazards due to Blockage of Sewer Lines	To avoid any blockage in sewer pipes	<ul style="list-style-type: none"> <li>Provision of sufficient O&amp;M staff;</li> <li>Provision of sewer cleaning equipment for cleaning the sewers will be included in the project cost;</li> <li>Development of a system to register public complaints and urgent clearance of blockages in the system</li> </ul>	
3.	Air Quality	To avoid air pollution	<ul style="list-style-type: none"> <li>Provision of exhaust gas vents at appropriate locations;</li> <li>Sewer-men will cover their faces with gas mask while entering the sewer for cleaning or maintenance purposes;</li> <li>Mandatory presence of first aid and ambulance during maintenance operations; and</li> </ul>	KW&SC
4.	Solid Waste	To avoid/ minimize nuisance and environmental pollution in the project area due to solid waste	<ul style="list-style-type: none"> <li>Waste will be collected, stored and disposed of according to relevant standards in approved facilities by KW&amp;SC;</li> <li>Schedule inspection of the sewer lines to keep it clean and to identify any hazardous material.</li> </ul>	KW&SC
5.	Community Health Hazards (CHHs)	To ensure removal of sludge to avoid any CHHs.	<ul style="list-style-type: none"> <li>The sludge will be timely removed from the site and the area will be barricaded during desludging and cleaning periods.</li> </ul>	

Sr. No.	Parameters	Target	Mitigation	Responsibility
6.	Operational Sustainability	To provide operations on its full efficiency.	<ul style="list-style-type: none"> <li>▪ Routine/ preventative maintenance and desilting will be carried out;</li> <li>▪ Immediate response to all sewer related complaints followed by prompt correction of defective condition;</li> <li>▪ Sufficient and properly working desilting machinery/equipment will be made available by KW&amp;SC.</li> </ul>	

**KEY**

CC	Construction Contractor
DC	Design Consultant
EPA	Environment Protection Agency
SC	Supervision Consultant
PIU-KWSSIP	PIU-Karachi Water & Sewerage Services Improvement Project

## **7.10 Grievance Redressal Mechanism (GRM)**

The Grievance Redress Mechanism (GRM), outlines the policy and procedure for documenting, addressing, responding and employing methods to resolve project grievances and complaints that may be raised by the PAPs or community members arising from environmental and social performance, the engagement process, resettlement and/or unanticipated environmental or social impacts resulting from project activities. The Section describes the scope and procedural steps and specifies roles and responsibilities of the parties involved. The purpose of the GRM is to receive, review and resolve grievances from PAPs and other stakeholders and ensure smooth and fair implementation of subproject activities.

### **7.10.1 GRM Principles**

A GRM is established to address any complaints or grievances arising during the implementation period of the projects. People of the project area may perceive risks to themselves or their property or their legal rights or have concerns about the possible adverse environmental and social impact that a project may have. Any concerns or grievances should be addressed quickly and transparently, and without retribution to the PAPs or complainant.

The primary principle of GRM is that all complaints or grievances are resolved as quickly as possible in a fair and transparent manner.

### **7.10.2 Objectives**

The GRM will provide a predictable, transparent, and credible process to all stakeholders, resulting in outcomes that are seen as fair, effective, and lasting. The specific objectives of the GRM are as follows:

- To allow stakeholders the opportunity to lodge complaints and raise concerns.
- To ensure that comments, responses, and grievances are handled in a fair and transparent manners.
- To mitigate or prevent adverse impacts on communities caused by the project works.
- To serve as an early alert system to project management of significant or recurring issues that might signal a systemic problem, and facilitate a resolution; and
- To achieve improved service delivery in water and sewerage sector whereby consumers have a sense of ownership and strong participation to get legitimate returns from the sustainable utilization of such services.

### **7.10.3 Type of Complaints**

The complaints that may arise during the execution of the proposed project at site include:

- Resettlement issues including loss of livelihood
- Issues related to compensation of resettlement impacts
- Dust, noise and air pollution;
- Damage to water supply lines or intermittent water supply during the civil work;
- Damage and blockage of sewer lines;

- Sewage overflows due to choked sewerage lines;
- Traffic inconvenience;
- GBV and harassment.

#### **7.10.4 Lodging of Complaint**

The complainant can lodge their complaints by opting of the following modes:

- A verbal or written complaint at the project site;
- A prescribed form available online at KWSSIP website of Grievances Redressal Mechanism Icon;
- Complaint by post on the specified address PIU;
- On a dedicated landline telephone number/line, which will be received by the GRM receiving officer; The grievance may be dropped in the complaint box placed at the working site;
- Complaint through e-portal of KWSSIP easily accessible from the mobile phones; and
- Complaints at Customer Services Center of KW&SC.

#### **7.10.5 Disclosure of GRM**

The GRM shall be disclosed at PIU-KWSSIP, KW&SC head offices, and concerned Executive Engineer (XEN) and Superintendent Engineer (SE) offices, KWSSIP website as well as on sub-projects sites.

#### **7.10.6 Structure of Grievance Redress Mechanism**

The project will establish a multi-tier GRM with designated staff responsibilities at each level. These tiers comprise the PAP Committee at the site; Grievance Redress Committee (GRC) at the Project level; and GRC at the PIU level. These tiers are described below.

These levels comprise the following:

##### **A. Project Affected Persons Committees (PAPCs) (Level - 1)**

For effective coordination in the field with PAPs and community, PAPCs will be established at the project site to maintain a close rapport and coordination with affected persons and local community throughout the project implementation. The PAPC will act as a coordinator among the PIU, the PAPs and local community for coordination and information dissemination to keep them informed about day-to-day development on the project, particularly about the grievance resolution process. The Social Development Specialist (SDS) of PIU, Social/ Community Mobilizer and SDS of supervision consultant will coordinate with the affected persons for constitution of PAPCs at the site level comprising of at least five members with one as the committee convener. The PAPC at community level will provide a platform for PAPs and other community members to raise and discuss their concerns, resolve petty issues at the site level and coordinate with project management to communicate the issues and concerns regarding social and environmental aspects. The project safeguards and engineering staff will coordinate

with PAPs and PAPCs to review and resolve the issue or concern related to resettlement planning or implementation as well as environmental and social concerns preferably within five days from receipt of the grievance. PAPC will comprise of the following members:

- Social/Community Mobilizer of PIU (to be hired by the PIU, male/ female will act as focal persons at community level to receive and record the complaints);
- Female member (from the project area);
- Two male members (from PAPs).

Any complaints that cannot be resolved at this level will be forwarded to the next tier.

## **B. Project Level GRC (Level - 2)**

PIU will constitute a GRC headed by Project Manager (PM) at the project level to resolve all grievances and complaints of the PAPs and other stakeholders. GRC shall comprise of the following members:

- Project Manager (PM), as head/convener of GRC;
- SDS/Gender Specialist of PIU;
- SDS of Supervision Consultant;
- Environment Specialist of SC (where applicable);
- Resident Engineer of project construction supervision consultant;
- Environment, social and gender specialist of contractor will act as focal point; and
- A representative of local community.

**Note:** Representative from any other Department may be called as and when required by the GRC. Environmental Specialist of SC will join GRC meeting related to Environmental issues only.

The GRC will meet once a month and when the need arises. The GRC will review grievances involving all resettlement planning and implementation, environmental issues (such as water, air, noise pollution) and social issues including, compensation for business losses and other assistance as well as social issues that may arise due to restricted access to the resources and amenities.

GRC will perform following functions:

- Record grievances, categorize and prioritize the grievances that need to be resolved by the committee and solve them within a month;
- Invite and hear aggrieved persons/parties to produce evidence of their claims and record their view point;
- Communicate its decisions and recommendations on all resolved disputes to project executors and the aggrieved persons for implementation;
- Forward the unresolved cases/ complaints to PIU within an appropriate time frame with reasons recorded and its recommendations;



- Develop an information dissemination system and acknowledge the aggrieved parties about the development regarding their grievance;
- Maintain a complaint register accessible to the stakeholders with brief information about complaints and GRC decision with status report; and,
- Maintain complete record of all complaints received by the GRC with actions taken.

Any complaint that cannot be resolved at the Project level GRC, will be forwarded to the next tier – the PIU GRC.

### **C. PIU Level GRC (Level - 3)**

At the third tier, the PIU has constituted a GRC at PIU level. The committee has the following composition:

- Project Director KWSSIP, (Chairman);
- SDS, Member
- Gender Specialist, Member;
- Concerned Project Manager – PIU, Member
- Senior Social Safeguards Specialist (Consultant) Member
- Representative of Civil Society.

The PIU GRC through authorized representative, will acknowledge the complainant about his/her complaint, scrutinize the record, investigate the remedies available and request the complainant to produce any record in favour of his/her claim. After thorough review and scrutiny of the available record on complaint, field visit will be conducted to collect additional information, if required. Once the investigations are completed, the PIU GRC will give decision within 30 days of receipt of the complaint. If the complainant is still dissatisfied with the decision, he/she can go to the court of law, if he/she wishes so. Organization of the GRM is shown in **Figure 7.2**.

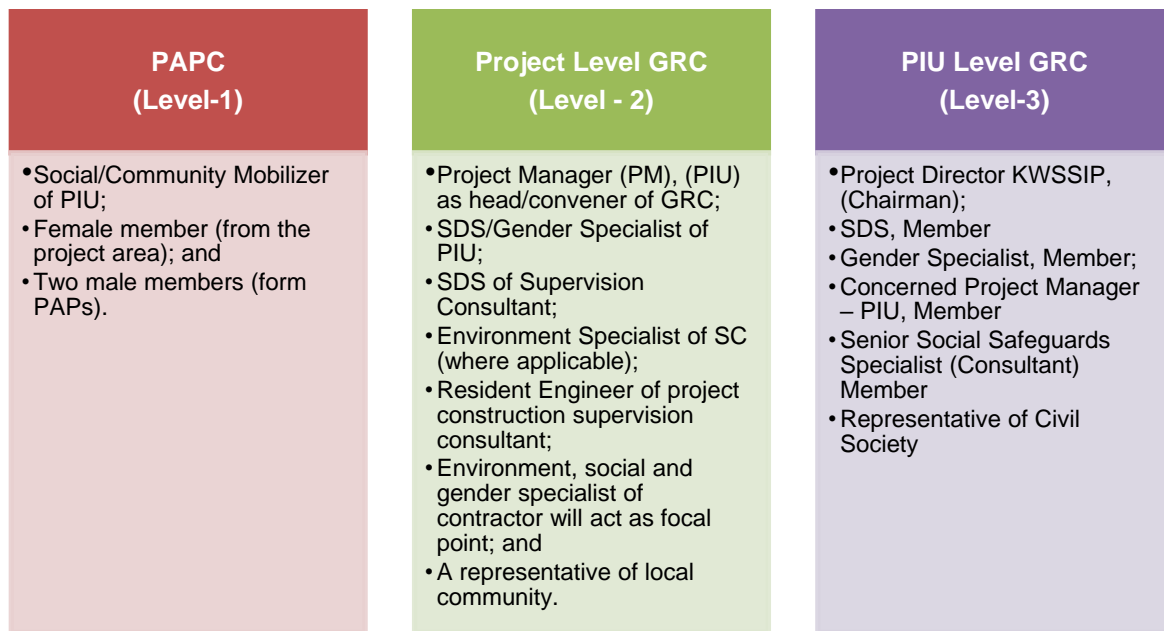
Gender representation will be ensured by inducting a female member in both GRCs. The mechanism will ensure the access of PAPs to a GRM that openly and transparently deals with the grievances and makes decision in consultation with all concerned that are consistent with the World Bank safeguard requirements.

### **D. SEA/SH Committee**

Besides GRC, at PIU level SEA/SH Committee has also been established and notified consisting of the following members;

- Concerned Project Manager, head/ convener
- Gender Expert KWSSIP, secretary
- SDP KWSSIP, member

SEA/SH Committee will address the gender related issues caused due to project activities.



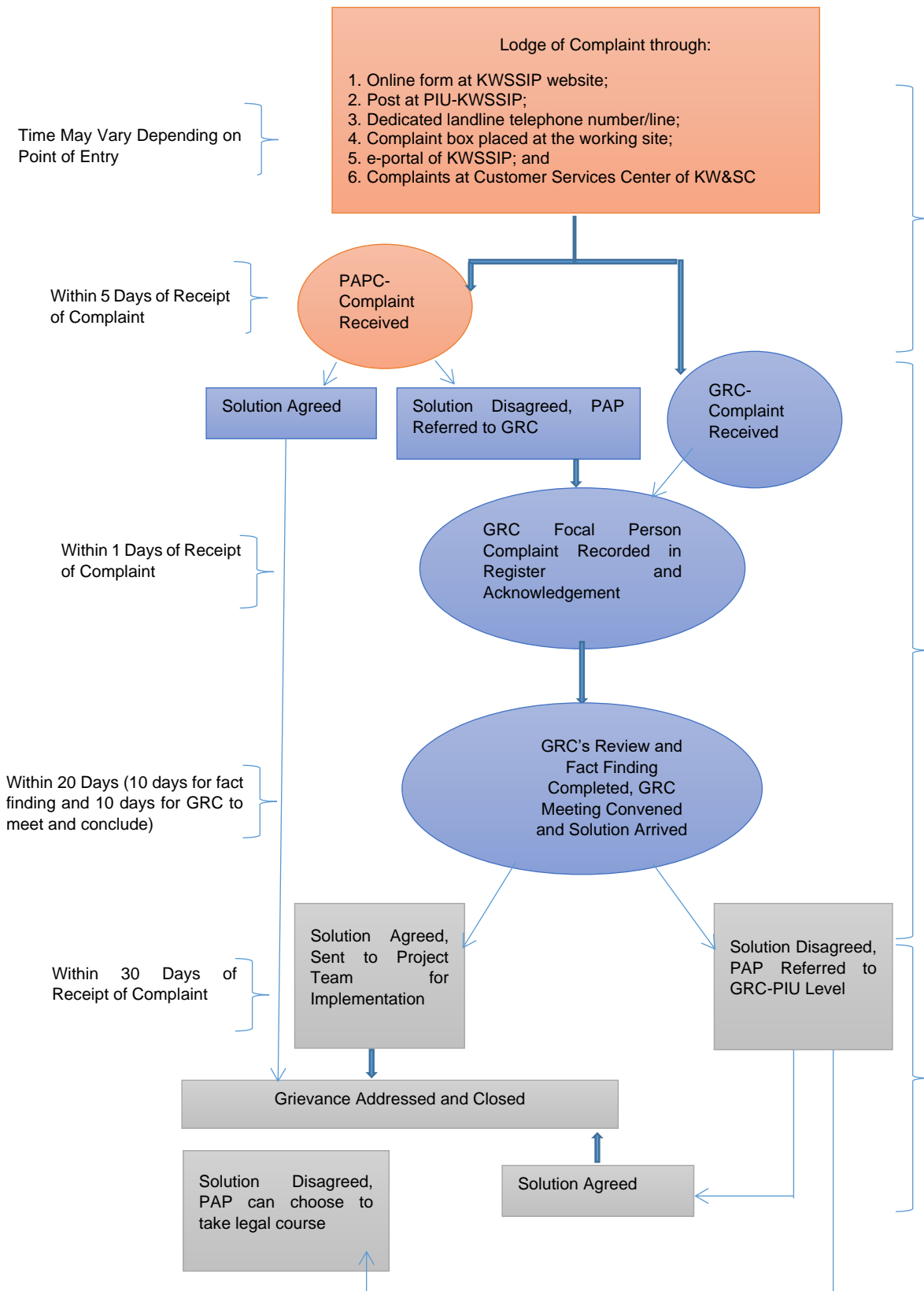
**Figure 7. 2: Organogram for GRM**

### 7.10.7 Grievance Redress Procedure

The complaints received through any media will be screened by type and category and registered in community complaints register (CCR), where the name and address of complainant, date, description of complaint and action taken will be recorded. The GRC will acknowledge the complaints within one day of receipt and will review available records. If required, GRC will advise the safeguards/engineering staff to conduct field visits in consultation with the aggrieved person, local community and submit a fact-finding report. Preferably, the fact finding will be completed within 10 days from receipt of complaints. The GRC in its formal meeting to be conducted within 20 days from receipt of complaint will hear and clarify with the complainant (if required so) about the issue and shall conclude and communicate its recommendations for further implementation. Complainant will be kept informed during the process and the GRC decision will be communicated to him/her in a language and form understandable to him/her. The GRC proceedings will be documented step by step and all records will be maintained and summarized in the project progress and internal monitoring reports.

The complainant will be at liberty to access the formal legal course if s/he is dissatisfied with the GRC findings and recommendations. If GRC fails to conclude its recommendations either due to some technical or legal constraint, the GRC will immediately report the issue to PIU level GRC and will request guidance and support it deems necessary. PIU-GRC will ensure to resolve the grievance within 30 days. In case of any delay, the complainants will be informed on the progress and process about their grievances.

Environmental and social issues will be dealt according to the same GRM procedures described above.



**Figure 7. 3: Grievance Process and Time Frame**

### 7.10.8 Workers' GRM

To mitigate the risks related to direct workers a GM for Contracted Workers will also be established:

- **Contractor's level.** Contractors should develop their own GRM and resolve the grievances of contracted workers. Grievance Focal Point (GFP) assigned by the Contractor will file the grievances and appeals of contracted workers and will be responsible to facilitate addressing the grievances. If the issue cannot be resolved at the contractor's level within 7 working days, then it will be escalated to the PIU of the KWSSIP local level.
- **Local level.** The Social Specialist of PIU local level in Karachi will serve as Grievance Focal Point (GFP) to file the grievances and appeals of the project workers. He/She will be responsible to coordinate with relevant departments/organizations and persons to facilitate addressing these grievances. If the issue cannot be resolved at the PIU level within 7 working days, then it will be escalated to the Agency level.
- **Central level:** If there is a situation in which there is no response from the PIU Local level, or if the response is not satisfactory then complainants and feedback providers have the option to contact the Project Director of KWSSIP or Focal Person in KW&SC Central Office directly to follow up on the issue.

### 7.11 Cost for testing of Ambient Air, Noise, Water

Testing and analysis for ambient air, noise and ground and surface water will be undertaken during construction and operational phases to ensure the effectiveness of the proposed mitigation measures. Certain environmental parameters will be selected and quantitative analysis will be carried out. The results of analysis will be compared with the guidelines; standards and pre-project conditions to investigate whether the ESMP and its implementation are effective for the mitigation of impacts or not. Parameters to be analyzed during construction and operation phase of the project and responsibilities for monitoring and reporting have been discussed in **Table 7.4**.

**Table 7. 4: Budget Estimate for Environmental Monitoring During the Construction and Operation Phases**

Components	Parameters	Quantity			Frequency	Responsibility	Unit	Rate (PKR)	Duration	Amount (PKR)
		Sampling Points	Frequency	Total						
<b>Construction Phase (12 months)</b>										
<b>Air Quality</b>	All SEQs parameters	1	4	4	Quarterly	Contractor	Each	35000	24 hours	140,000
<b>Ground Water Quality</b>	All SEQs parameters	1	4	4	Quarterly	Contractor	Each	20000	-	80,000
<b>Surface Water Quality</b>	All SEQs parameters	1	4	4	Quarterly	Contractor	Each	20000	-	80,000
<b>Noise Level</b>	-	1	4	4	Quarterly	Contractor	Each	2000	24 hours	8,000
<b>Sub-Total</b>										<b>308,000</b>
<b>Operation Phase (1st year)</b>										
<b>Air Quality</b>	All SEQs parameters	1	1	1	Annually	KW&SC	Each	35000	24 hours	35,000
<b>Ground Water Quality</b>	All SEQs parameters	1	2	2	Biannually	KW&SC	Each	20000	-	40,000
<b>Surface Water Quality</b>	All SEQs parameters	1	2	2	Biannually	KW&SC	Each	20000	-	40,000
<b>Noise Level</b>	-	1	1	1	Annually	KW&SC	Each	2000	24 hours	2,000
<b>Sub-Total</b>										<b>117,000</b>
<b>GRAND TOTAL</b>										<b>425,000</b>

Note: Provision will be given in the annual budget of the operation phase for environmental monitoring. For this, the cost of operational phase monitoring will be considered with an annual increment of 10%.

## 7.12 Environmental Technical Assistance and Training Plan

In order to ensure that the ESMP provisions are implemented efficiently and effectively, training and capacity building/ strengthening of the implementing parties are required. Therefore, based on the assessment of the institutional capacities of the parties involved in the implementation of the ESMP, the following broad areas of capacity building/strengthening have been identified and recommended for effective implementation of the ESMP.

### 7.12.1 Training Program

The environmental and social training will help to ensure that the requirements of the ESMP are clearly understood and followed by all project personnel. The primary responsibility of providing these trainings to all project personnel will be that of the contractor and the SC. The trainings will be provided to different professional groups separately such as managers, skilled personnel, unskilled labors, and camp staff. Capacity building will be aimed at strengthening the ESC, and operational staff in the field of environmental management and social development. **Table 7.6** provides detail of trainings required for implementation of ESMP during construction and operational phase.

## 7.12.2 Institutional Strengthening

For the institutional strengthening of the Contractor following two (02) personnel have been proposed:

- Environmental/ HSE Expert
- Social/ Gender Expert

The responsibilities of the E&S staff are given hereunder:

### Environmental/ HSE Expert

- Complete understanding of WB, local and federal environmental regulations.
- Implement environmental guidelines and practices.
- Review and recommend improvements to existing environmental programs for compliance assurance.
- Generate environmental reports as requested by regulatory agencies.
- Provide guidance and direction to management for ensuring environmental compliance.
- Prepare permit applications and agreements as needed by regulatory agencies.
- Obtain, maintain, modify and renew environmental permits and licenses.
- Work with emergency response team to address environmental incidents such as chemical leaks and spills.
- Identify and solve environmental violations.
- Conduct regular environmental inspections to determine pollution level.
- Investigate environmental accidents and propose corrective actions.
- Educate workers on environmental health and safety procedures.
- Collect baseline social data to assess the social impacts associated with the alternatives.
- Conduct and document surveys, group discussions and interviews with stakeholders and local people.
- Identify social negative impacts and benefits likely to result from the construction and operation of the project.
- Based on the available information, prepare the Initial ESMP/ESIA based on the prefeasibility designs and determine in respect of each alternative whether the impacts of the proposed project are likely to be significant.
- Provide input into the feasibility design of the project based on the preferred option, proposing measures to minimize social impacts during construction and operation. Propose measures to mitigate negative impacts.
- Guide the preparation of and ensure quality assurance for the following: social impact assessment,
- Identify compensation and mitigation measures according to national and international standard.
- Identify all impacts on resettlement (physical/ economic) in proposed project and develop plan for resettlement as per World Bank Policies and local regulations.
- Formulate plan towards land acquisition as appropriate and resettlement of communities affected under project
- Assist Team Leader and the implementing agencies on matters related to land acquisition and resettlement at multiple locations.
- Participate in meetings with the client, project team and other key stakeholders
- Analyze country's gender policies
- Compilation, analysis and interpretation of gender issues
- Provide advice and support to on gender issues.

- Guidance for gender specific programming.
- Develop, maintain and disseminate a plan addressing gender perspective in the project area and provide information as required for different purposes.

### **Social/ Gender Expert**

- Collect baseline social data to assess the social impacts associated with the alternatives.
- Conduct and document surveys, group discussions and interviews with stakeholders and local people.
- Identify social negative impacts and benefits likely to result from the construction and operation of the project.
- Based on the available information, prepare the Initial ESMP/ESIA based on the prefeasibility designs and determine in respect of each alternative whether the impacts of the proposed project are likely to be significant.
- Provide input into the feasibility design of the project based on the preferred option, proposing measures to minimize social impacts during construction and operation. Propose measures to mitigate negative impacts.
- Guide the preparation of and ensure quality assurance for the following: social impact assessment,
- Identify compensation and mitigation measures according to national and international standard.
- Identify all impacts on resettlement (physical/ economic) in proposed project and develop plan for resettlement as per World Bank Policies and local regulations.
- Formulate plan towards land acquisition as appropriate and resettlement of communities affected under project
- Assist Team Leader and the implementing agencies on matters related to land acquisition and resettlement at multiple locations.
- Participate in meetings with the client, project team and other key stakeholders
- Analyze country's gender policies
- Compilation, analysis and interpretation of gender issues
- Provide advice and support to on gender issues.
- Guidance for gender specific programming.
- Develop, maintain and disseminate a plan addressing gender perspective in the project area and provide information as required for different purposes.

**Table 7.5** presents cost of institutional strengthening.

**Table 7. 5: Cost of Institutional Strengthening**

<b>Sr. No.</b>	<b>Description (Position)</b>	<b>Quantity</b>	<b>Unit</b>	<b>Rate (PKR)</b>	<b>Amount (PKR)</b>
<b>Construction Phase - 12 months</b>					
1	Environmental Expert/ HSE Expert	12	Each	200,000	2,400,000
2	Social / Gender Expert	12	Each	200,000	2,400,000
<b>Total Cost</b>					<b>4,800,000</b>



**Table 7. 6: Institutional Training for Implementation**

Training Activity	Participants	Content	Scheduling	Amount PKR
Environment code of practices	Contractor Staff	Awareness & applicability of environmental code of practices	Once	100,000
Awareness workshop regarding Covid 19 and other vector borne diseases	Contractor Staff	Risk, Prevention and available treatment	Once	100,000
Waste Management	Contractor Staff	Awareness associated with waste Storage, collection and safe disposal	Once	100,000
Workshop on Emergency Response	Contractor Staff	Potential natural and other hazard/emergencies and dealing with emergency to minimize damage	Once	100,000
Workshop on Community/ occupational health and safety	Contractor Staff	Awareness on EHS Guidelines	Once	100,000
Gender Aspects	Contractor Staff	Awareness on gender inequalities/GBV OP 4.20	Biannually	100,000
<b>Total</b>				<b>600,000</b>
<b>Operation Phase (12 months)</b>				
Environment code of practices	KW&SC Staff	Awareness & applicability of environmental code of practices	Once	100,000
Awareness workshop regarding Covid 19 and other vector borne diseases	KW&SC Staff	Risk, Prevention and available treatment	Once	100,000
Waste Management	KW&SC Staff	Awareness associated with waste Storage, collection and safe disposal	Once	100,000
Workshop on Emergency Response	KW&SC Staff	Potential natural and other hazard/emergencies and dealing with emergency to minimize damage	Once	100,000
Workshop on Community/ occupational health and safety	KW&SC Staff	Awareness on EHS Guidelines	Once	100,000
Gender Aspects	KW&SC Staff	Awareness on gender inequalities/GBV OP 4.20	Once	100,000
<b>Total</b>				<b>600,000</b>

### 7.13 Cost for Tree Plantation

The project does not involve clearance of vegetation and trees; however, 150 trees are proposed to be planted in the project area for environmental enhancement. Cost of tree planation has been estimated to be **PKR 450,000 /-**. Breakdown of cost is given in **Table 7.7**.

**Table 7. 7: Tree Plantation Cost – Scheme P1**

Sr. #	Plants	Quantity	Unit	Rate (PKR)	Amount (PKR)
<b>1</b>	<b>Shady trees</b>				
1.1	Gul Mohar (Delonix Regia) 18"(Bag)	75	Each	2500	187,500
1.2	Neem (Azadirachta Indica) 18"(Bag)	75	Each	600	45,000
<b>Sub Total-A</b>					<b>232,500</b>
1.3	Transportation charges	-	%	5	11,625
1.4	Mortality	-	%	15	34,875
1.5	Contractors Profit (of total cost)	-	%	20	46,500
<b>Sub Total-B</b>					<b>93,000</b>
<b>2</b>	<b>Input Requirements</b>				
2.1	Fertilizer (NPK) (Transportation charges included)	10	Gram	0.20	2
2.2	FYM (Transportation charges included)	2	Kg	7	14
2.3	Pesticide	1	Each	10	10
2.4	Contractors Profit (of total cost)	20	%	-	5
<b>Sub Total (for 1 tree)</b>					<b>31</b>
<b>Sub Total - C (for 150 trees)</b>					<b>4,680</b>
<b>3</b>	<b>Development (For 3 Years)</b>				
3.1	Head Gardner	1	Man-Month	50,000	50,000
3.2	Gardner	1	Man-Month	36,000	36,000
<b>Sub Total - (C)</b>					<b>86,000</b>
3.3	Miscellaneous (Vehicle expenditures, wear & tear of tools etc.)	15	%	-	12,900
3.4	Contractors Profit (of total cost)	20	%	-	17,200
<b>Sub Total - (D)</b>					<b>116,100</b>
<b>Grand Total (Sub Total A+B+C+D)</b>					<b>446,280</b>
<b>Say</b>					<b>450,000</b>

### 7.14 Cost for Health and Safety

Cost of Health and Safety during construction phase is given in **Table 7.8**.

### 7.14.1 Cost for Health and Safety during Construction phase

**Table 7. 8: Health and Safety Cost during Construction Phase**

Sr. No.	Description	Quantity	Unit	Rate (PKR)	Amount (PKR)
1	Medical screening for workers	50	Persons	5000	250,000
2	Tarpaulins	2	L.S.	30000	60,000
3	Handling of hazardous material	12	L.S.	50000	600,000
4	Handling of solid waste	12	L.S.	10000	120,000
5	DCP Fire extinguishers in case of fire	2	Each	3500	7,000
	CO2 Fire extinguishers in case of fire	2	Each	10000	20,000
	Fire alarm	1	Each	10000	10,000
6	Special Measures for Covid-19		L.S.		500,000
7	Cost of Personal Protective Equipment (PPE)*		L.S.		1,169,000
<b>Total Cost</b>					<b>2,736,000</b>

Details of PPE cost is given below in **Table 7.9.**

**Table 7. 9: Break-up for PPEs Cost during Construction Scheme No.1 Teen Hatti**

Sr. No.	Description	Quantity	Unit	Rate (PKR)	Amount (PKR)
1	Ear plugs	600	Each	100	60,000
2	Helmets	100	Each	1500	150,000
3	Safety shoes	100	Each	3000	300,000
4	Protective goggles	100	Each	2000	200,000
5	Gloves	600	Each	300	180,000
6	H <sub>2</sub> S Mask & Kit	2	Each	15000	30,000
7	Dust Mask	2,400	Each	100	240,000
8	Face Sheild	2	Each	2000	4,000
9	First Aid Kit	1	Each	5000	5,000
<b>Total</b>					<b>1,169,000</b>
<b>Time required for Construction = 12 months</b>					
<b>No. of labour required = 50</b>					
<b>Detail of Personal Protective Equipment PPE</b>					
Dust mask	1 dust mask to be used in a week by each laborer				
Safety Shoes	1 pair of safety shoe for six months for each laborer				
Safety Helmet	1 safety helmet for each worker				
Gloves	1 pair of gloves for each laborer for a month				
Safety Goggles	1 safety goggles for six months for each laborer				
Face Shield	1 face shield for six months for each laborer				
First Aid Box	1 first aid box				
Ear Plug	1 set of ears plug to be used for 1 month for each laborer				

## 7.15 ESMP Cost

Total cost for implementation of ESMP has been worked out as **PKR 10,196,550/-**. Detail is given as under in **Table 7.10**. The cost in construction phase shall be the responsibility of Contractor while KW&SC shall bear the cost in operational phase.

**Table 7. 10: Cost for Implementation of ESMP**

Description	Amount (Rs)	
	Construction	Operation
Environmental Management Cost		
a) Environmental Monitoring	308,000	117,000
b) Institutional Strengthening	4,800,000	---
c) Training	600,000	600000
e) Tree Planatation	450,000	---
f) Halth & Safety	2,736,000	---
<b>Sub-Total</b>	<b>9,611,000</b>	
Contingencies @ 5%	482,550	
<b>Grand Total</b>	<b>10,091,550</b>	

**Annex-I**  
**Photolog of Existing Site Condition**

### Glimpse of Existing Site Condition of P1-Teen Hatti





**Annex-II**  
**AED Screening Report**



## KARACHI WATER AND SEWERAGE SERVICES IMPROVEMENT PROJECT

### ANTI-ENCROACHMENT DRIVE (AED) RELATED SCREENING REPORT

#### TEEN HATTI TO DAAK KHANA FLYOVER

#### (District Central)

### 1. Introduction

The Karachi Water & Sewerage Services Improvement Project (KWSSIP), funded by World Bank and AIIB, is an initiative of Government of Sindh (GoS) and Karachi Water and Sewerage Board (KW&SB) to improve water and sewerage services in Karachi. This Project has been appraised to an indicative cost of USD 1.6 billion as a Reform Led Investment Program in 4 overlapping phases to be implemented in a span of 12 years. The Phase 1 of KWSSIP, which is named SOP 1 (Series of Projects 1) has an investment portfolio of USD 100 million. Its implementation is being undertaken by GoS/KW&SB commencing with a number of procurements likely to take place within a short period of time.

The SOP1 of KWSSIP has been designed in following three components:

**Component 1:** Reform in Karachi Water and Sewerage Board

**Component 2:** Securing Sustainable Water Supply & Sewerage (Infrastructure investments)

**Component 3:** Project Management and Studies

However, three sub-projects under Components 2 of SOP1 are included under the scope of the Consultant (NESPAK):

Sr. No.	Assignment	Project	Target
1	A	Rehabilitating Water Supply and/or Sewerage in three low-income areas	Provision of water supply and sewerage networks in 03 nos. Low-income Communities/ Katchi Abadis
2	B	Priority Water Network Rehabilitation including O&M Equipment, Meters & DMAs to Reduce NRW	Installation of Bulk Flow Meters and chlorination stations
3	C	Priority Sewer Network Rehabilitation	Provision of sewerage networks in priority schemes

### 2. Anti-Encroachment Drive (AED)

Informal settlements and squatters are widespread in Karachi, including residential and commercial encroachers on vacant lands, sidewalks, public spaces etc. A major Anti-Encroachment Drive (AED) was initiated in Karachi in October 2018 on the order of the Supreme Court of Pakistan. The Court ordered to vacate public spaces (parks, footpaths, amenity plots, etc.) across the city from unauthorized uses and occupations. The order is

currently under implementation by various civic and local agencies, including Karachi Municipal Corporation (KMC), who are required to report periodically to the Court on progress. The focus of the AED is on commercial activities encroaching public spaces. Thousands of businesses, street vendors and hawkers have been affected, primarily in the most commercial districts. Acknowledging the adverse impacts of AED on the poor and vulnerable groups, the Government of Sindh (GoS) and local agencies like KMC are making efforts to relocate some affected businesses.

### **2.1 Types of Structures and/or Non-structures affected by AED Activities**

Types of structures removed or affected by AED activities are listed below:

- Illegal shops/cabins
- Sunshades
- Illegal walls and wall fixtures
- Extended portions (of shops, hotels, cabins, marriage halls)
- Marriage halls/fitness centers/buildings/illegal construction on green
- Belts and plots
- Chabootras (paved terrace, raised platform) and foot steps
- Thailay (pushcarts)/ patharay (selling on rug, or table counter)/counters, misc.

### **2.2 Zone of impact:**

In general, for sewer and water network refurbishment and rehabilitation (including in low-income communities), the zone of impact for each subproject, individual sewer or water rehabilitation schemes, is defined as the trench for the placement of the sewer or water supply pipe in the street and any additional area required for construction related activities (construction camp, parking of machinery, stocking of materials, debris, backfill, area used by construction labor, or any other temporary use etc.); and, any areas impacted temporarily by the construction (e.g. due to reduced access). Bank policies (OP 4.12) and the screening mechanism applies to the subproject zone of impact.

### **2.3 Project's Policy on AED**

According to Project Appraisal Document (PAD) of the current study *“Potential subproject sites (including proposed construction sites and associated zones of impact) located within areas already impacted by the AED on or after October 27, 2018 will not be eligible for financing under the project”*.

### **2.4 Project's Planning in view of AED**

In view of encroachment issues and current AED activities in the city, a general principle has been adopted to fix the proposed alignments of sewerage and water supply schemes by avoiding resettlement/ loss of business or livelihood. The schemes where AED activities have been done in recent times, have already been removed from project's planning and scope.

### 3. Project Risk Reduction Procedure (PRRP)

Each subproject was first assessed to determine if it is located in an area affected by AED. The assessment also determined the extent to which surrounding areas of the proposed subproject were also affected by AED. Only subprojects whose construction sites plus associated zones of impact are located in areas that have not been impacted by the AED will be eligible for financing. Zones of impact for different typologies of subprojects were determined, on a case-by-case basis, following procedures outlined in the project's SMF/RPF. These screening criteria are summarized below as a step-wise process and are described in detail in the project's SMF and RPF.

**Step 1:** KWSB prepared a list of subprojects for renewal, rehabilitation, and replacement of the sewerage and water supply networks rehabilitation during early project implementation. These lists of subprojects will be matched with the lists of areas where the AED activities have taken place in Karachi – available with the Commissioner Karachi Division - to identify if any of the subprojects lie in any of these areas. This 'matching' will enable the current AED status of each subproject to be identified. Only subprojects with no AED will be eligible for Bank financing and their preparation will continue in accordance with safeguards frameworks and other Bank policies.

**Step 2:** While KWSSIP will ensure exclusion of areas where AED has already happened in the past (under Step 1), there may be unforeseen cases in which government agencies need to carry out AED activities, under Supreme Court orders, in KWSSIP subproject areas while construction is underway. In order to address such unforeseen cases, KWSB will develop a working arrangement with the Commissioner Karachi Division (the office tasked by the GoS to co-ordinate AED activities in Karachi) to ensure compliance with the KWSSIP RPF during subproject construction.

**Step 3:** KWSB will prepare a screening report for each subproject- including evidence of no AED in the subproject area; photographic record and baseline information documentation for each subproject; letter of agreement with the Commissioner Karachi Division – and share it with the third-party monitor for verification. The verified report will be submitted to the Bank for clearance and no objection.

### 4. Screening of AED Affected Areas

Commissioner's office was approached to collect previous data available with the department with reference to AED. Unfortunately, no past data is available in this regard, therefore, AED related screening of subproject sites was carried out in different districts of Karachi with the help of focal persons of District Municipal Corporations (DMCs), Municipal Corporations (MCs) and District Councils nominated by concerned Deputy Commissioners' offices.

Joint visits of focal persons from civic agencies, Environmental and Gender (Social) Experts of KWSSIP (Client) and the Consultants of SOP-1 were conducted to screen out the subprojects affected by AED in a week-long activity starting from 28.02.2022 to 04.03.2022.

Summary of Meetings held with Additional Commissioner – II and Assistant Commissioner is given in **Table 1** below:

### Summary of Meetings

Sr. No.	Venue	Date	Time	Participants			Points Discussed
				Name	Department	Designation	
01.	<u>Commissioner's Office</u>	21-02-22	11:00 am	Miss Sara	Commissioner's Office	Assistant Commissioner	<ul style="list-style-type: none"> <li>AC Miss Sara informed that 30 focal persons from different DMCs and KMC have been trained to collect AED related data through a mobile app named Kobo Collect for CLICK project.</li> <li>It was suggested by the participants to nominate already trained personnel for collecting AED data for KWSSIP.</li> <li>It was decided that a field plan will be shared with the AC office which will be forwarded to the concerned DC offices for nomination of focal persons.</li> </ul>
				Miss Hameeda Kaleem	KWSSIP	Social (Gender) Expert	
				Miss Kiran Bano	KWSSIP	Environmental Expert	
				Mr. Syed Zeeshan Abbas	NESPAK	Senior Engineer	
				Mr. Asad Iqbal	Anti-Encroachment Cell	GIS Expert	
02.	<u>Commissioner's Office</u>	24-02-22	01:00 pm	Mr. Jawad Muzaffar	Commissioner's Office	<u>Additional Commissioner - II</u>	

Sr. No.	Venue	Date	Time	Participants			Points Discussed
				Name	Department	Designation	
				Miss Sara	Commissioner's Office	Assistant Commissioner	<ul style="list-style-type: none"> <li>• The Project background and its components were briefly discussed</li> <li>• Clarity and identification of SOPs</li> <li>• Discussion on AED related activities in Karachi</li> <li>• Current status of AED was also discussed</li> <li>• Discussion of WB's policy on AED</li> <li>• Planning for Physical Verification, Community Involvement</li> <li>• Planning for joint surveys</li> <li>• Development of Time schedule/ work plan to communicate with other Departments</li> </ul>
				Miss Hameeda Kaleem	KWSSIP	Social (Gender) Expert	
				Miss Kiran Bano	KWSSIP	Environmental Expert	
				Saeed Hussain	NESPAK	Social and Resettlement Expert	
				Mr. Syed Zeeshan Abbas	NESPAK	Environmental Engineer	



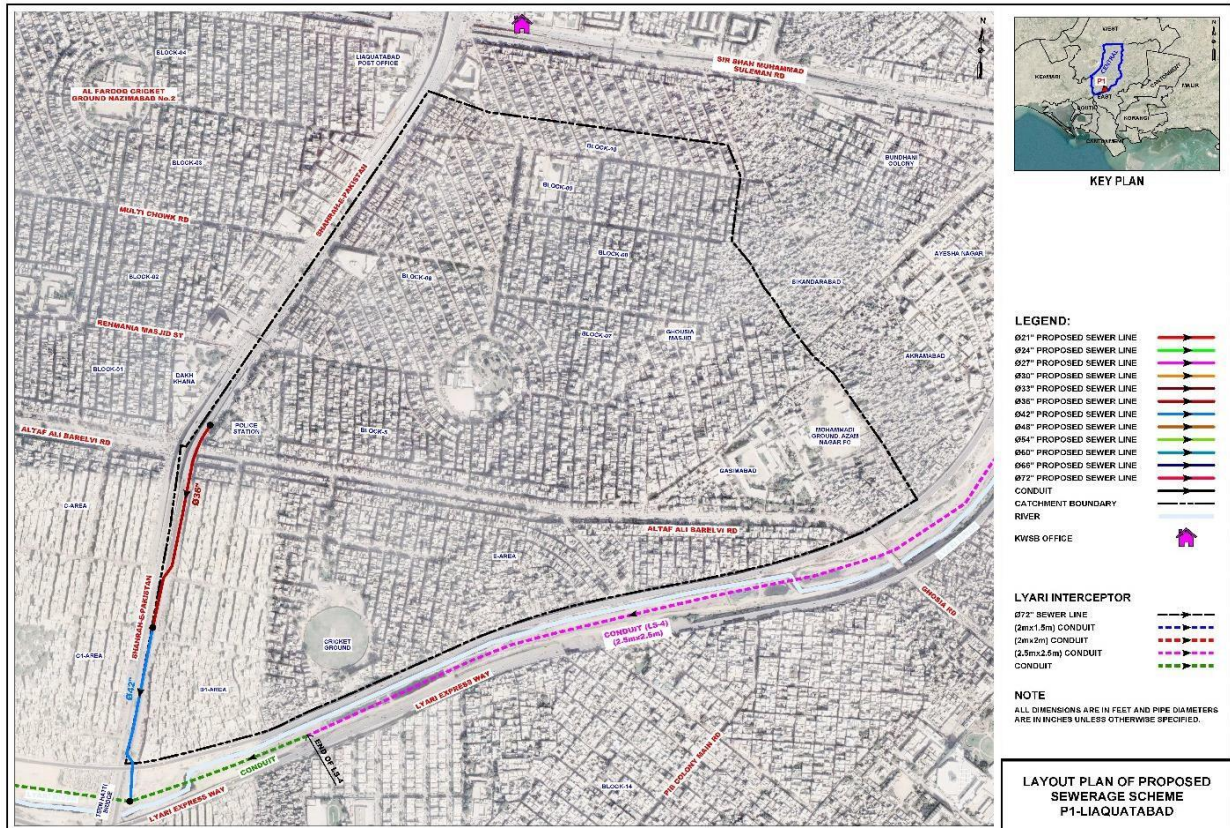
**Meeting with Additional Commissioner – II**



**GIS Section of Anti-Encroachment Cell  
(Commissioner's Office)**

## 4.1 Proposed Sewerage Scheme in Liaquatabad – P1: Teen Hatti to Daak Khana Flyover

Liaquatabad Town is situated in the Central Karachi District on the Western side of Lyari River. It is located on the South-Eastern side of North Nazimabad Town and Southern side of Gulberg Town. The location of Scheme P1 can be seen in Figure below. Liaquatabad Town has a large number of residential as well as commercial zones. The total catchment area of this sewerage scheme is 349.21 acres.



## 4.2 Team Composition

AED related screening of Scheme P-1 (District Central) was carried out by following Team:

Sr. No.	Name	Designation	Department
1	Mr. Shahzad Ahmad	Deputy Director Anti- Encroachment	DMC Central
2	Mr. Shariq	Incharge Anti- Encroachment	DMC Central
3	Ms. Hameeda Kaleem	Gender/Social Expert	KWSSIP
4	Ms. Kiran Bano	Environmental Expert	KWSSIP
5	Mr. Ali Hamid	Group Leader-E&SS	NESPAK
6	Mr. Syed Zeeshan Abbas	Senior Engineer	NESPAK
7	Mr. Aftab Ali Talib	Senior Engineer	NESPAK

### 4.3 Date of AED Related Screening

AED related screening for Scheme P-1 was conducted on 01.03.2022.

### 4.4 Methodology Adopted for AED Related Screening

The AED related screening was assessed through following means:

- Information from focal person of concerned district;
- Visual observations of focal persons, Consultants and KWSSIP experts at the time of screening survey; and
- Public consultations

### 4.5 Public Consultations

Informal public consultations were held at the subproject site to ascertain the views and information from the locals including residents and business operators regarding AED related activities in the project area. The list of participants is attached as **Annex – II**. People were gathered during consultations and following points were discussed:

- People were given brief introduction of the proposed project activities;
- People were enquired about AED activities in their area after October, 2018.
- It was briefed that project has been designed by keeping in view minimum loss of business, hindrance in excess to business premises and disturbance to local residence by adopting best planning and engineering practices
- Efficient construction management will be ensured throughout the project in order to minimize disturbance during construction.

Mostly, the people were in favor of the project. Their major concerns and apprehensions are given in the next section.

### 4.6 Findings

Based on the information provided by the focal person, visual observations and public consultations, it is derived that no AED has been conducted in Scheme P-1 since October 2018. The screening proforma duly signed by the focal persons, KWSSIP experts and Consultant's representative is attached **Annex - I**:

Sr. No.	Representative	Observations	Concens/ Apprehensions
1	DMC	No AED	--
2	KWSSIP	No AED	--
3	NESPAK	No AED	--
4	Community	No AED	<ul style="list-style-type: none"> <li>• Temporary loss of business</li> <li>• Alternate access route</li> <li>• Ensure minimum disturbance</li> </ul>



## 4.7 Photolog



## 4.8 Conclusions

Following are the conclusions of AED related screening in District Central

- No AED has been done in Scheme P-1, Liaquatabad;
- No Objection Certificate (NOC) is attached as **Annex-III**.

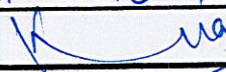
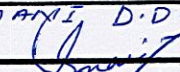
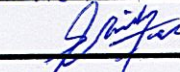
**Annex – 2A**  
**AED Screening Proforma**





ANTI ENCROACHMENT DRIVE DATA TEMPLATE				LAND OWNING AGENCY -						
Nature of Encroachment	Details (numbers, typology, function & dimensions of built structures/trade & typology of movable encroachments - vendors)	Location			Time of AED operation (D/M/Y)	Impacted Person/s Details				
		UC	Neighborhood	GPS Coordinates		Name	Gender	Age	CNIC#	Contact#
spillovers/ extensions	Auto parts				/					
	Chabotra (example naan ovens)									
	Grills									
	Cages (example poultry)									
Huts/shacks	Residential									
	Commercial (example eateries)									
Cattle pans										

5- Key Informants Contacted and key minutes: Name: Tunaid Cell No. 0314-2414250  
 = Doing business since long.  
 = No AED done.

TEAM MEMBERS:			
	<b>PIU-KWSSIP</b>	<b>Focal Person-KMC DMU Central</b>	<b>NESPAK-Rep</b>
Name:	<u>Kiran Bano</u>	Name: <u>SHAHZAD AHMED USMANI D.D. AED.</u>	Name: <u>Feeshaq</u>
Signature:		Signature: 	Signature: 

0300-2187280.

**DEPUTY DIRECTOR**  
**ANTI-ENCROACHMENT**  
**DEPARTMENT GULBERG ZONE**  
**DMC CENTRAL**

**Annex – 2 B**  
**List of Participants**

**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED NESPAK)**

**KARACHI WATER & SEWERAGE SERVICES IMPROVEMENT PROJECT  
(KWSSIP)**

**Public Consultation**

Location: Liagatabad (Scheme P-1)

**List of Participants:**

Sr. No.	Name	Cell No.
1	Javed Zaybal	0300-2321437
2	Naveed	0300-2321437
3	Awas	0316-2673456
4	Ali	0318-0028220
5	Junaid	0314-2414250
6		
7		
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11		
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14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

**Annex – 2C**  
**NO OBJECTION CERTIFICATE**





OFFICE OF THE  
**DEPUTY COMMISSIONER**

DISTRICT CENTRAL KARACHI

Karachi, dated 12-04-2022.

No. DC/C/ADC-II/C/PA / 327/2022,

Near Sakhi Hassan, North Nazimabad Karachi, Ph. 021-99260042 FAX 021-99260036,  
E-Mail- dccentralkarachi@gmail.com

To,

**The Assistant Commissioner (Headquarters),**  
For Commissioner Karachi Division.

Subject

**ANTI-ENCROACHMENT VERIFICATION CERTIFICATE OF IDENTIFIED SCHEMES**

Reference

Your office letter No. CK/Home.Br/Misc/2022-160, dated 31-03-2022, on the subject cited above.

It is submitted that the contents of the above-cited letter, alongwith its enclosures, have been verified through Assistant Commissioners concerned and Anti-Encroachment Department, DMC Central, which was a part of AED screening survey.

It is, therefore, certified that no Anti-Encroachment Drive (AED) has been carried out since October, 2018 at the locations of proposed schemes of KWSSIP in district Central Karachi, mentioned in the enclosures.



  
12-4-2022  
**ADDL DEPUTY COMMISSIONER-II**  
**DISTRICT CENTRAL**  
**KARACHI**

Copy to:

1. The Project Director, Karachi Water & Sewerage Board Services Improvement Project (Project Implementation Unit), KW&SB.
2. PA to Deputy Commissioner, Karachi Central.

**Annex – 2D**  
**KOBO TOOLBOX RESULTS**

Submission Record (7 of 15)



Validation status: Select...

[← PREVIOUS](#)   [NEXT >](#)

Display XML names

EDIT
VIEW
DUPLICATE

Type	Question	Response
	Is this encroachment commercial or residential?	
abc	Which other type	
	Select all parts that belong to this encroachment	
	Specify the "Extension or Spillovers"	
	Specify the "Movable Structure"	
abc	Which Other Type	
abc	Which Other Type	
abc	Approximate dimensions of the encroachment Hard Built Structure in feet (Type in the order LengthXWidthXHeight)	
abc	Approximate dimensions of the encroachment Extension or Spillovers in feet (Type in the order LengthXWidthXHeight)	
abc	Approximate dimensions of the encroachment Wall in feet (Type in the order LengthXWidthXHeight)	
abc	Function of this encroachment	
	GPS Location	latitude (x.y °): 24.898986 longitude (x.y °): 67.044753 altitude (m): 0 accuracy (m): 0
abc	Address	Karachi Liaquatabad
	Date of Visit	Mar 1, 2022
	Date of AED Operation	
	Picture of the encroachment	



☰	Is the owner occupying the encroachment structure?	
abc	Name of the owner	
☰	Gender of the owner	
abc	CNIC# of the owner	
abc	Mobile number of the owner	
abc	Name of the Renter	
☰	Gender	
abc	CNIC# of the Renter	
abc	Mobile number of the Renter	
123	Number of family members and/or employees using this encroachment?	
abc	Additional Detail	P-1(Teen Hati) No AED observed in this area according to shopkeeper
1+1		vPKgiKgqmMYUNKMtEjhYfh

	start	2022-04-23T17:18:57.544+05:00
	end	2022-04-25T13:12:35.524+05:00
	today	
	username	
	sim serial	
	subscriber ID	
	device ID	
	phone number	
	audit	
	__version__	vPKgiKgqmMYUNkMtEjhYfh
	_id	153357119
	instanceID	uuid:2d741e7c-c637-4986-914c-cb2b434dc282
	Submitted by	

**Annex-III**  
**Environmental Monitoring Lab**  
**Results**

# **ENVIRONMENTAL MONITORING AND TESTING REPORT 2022**

## **Ambient Air And Noise Monitoring Report**

### ***Project***

**Environmental and Social Safeguard Studies for Priority Sewer Network  
Rehabilitation**

### **HSE Services**

1<sup>st</sup>, 2<sup>nd</sup> Floor, 47<sup>th</sup> Commercial Area, Cavalry Ground Lahore Cantt.  
0300-400347, 042-36677188  
209-210-B 2<sup>nd</sup> Floor Phase II, Dhedhi Business Ave, Plot E-2 State Avenue  
Road, S.I.T.E Karachi  
0301-4000347, 0309-4000347  
Email: [Info@hse.com.pk](mailto:Info@hse.com.pk)  
Web: [www.hse.com.pk](http://www.hse.com.pk)



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## 1. Executive Summary:

### Description of Project

**Project Name:** Environmental and Social Safeguard Studies for Priority Sewer Network Rehabilitation

**Project Type:** Environmental Monitoring

**Laboratory Name**  
**Laboratory Address** M/s HSE Services  
209-210 2nd Floor Phase II, Dhedhi Business Ave, Plot E-2 State Avenue Road , S.I.T.E Karachi

**Client Name:** M/s National Engineering Services Pakistan (PVT) Limited  
**Client Address:** NESPAK House: 1-C Block-N Model Town Extension, Lahore

### Consultant's Team Detail

**Zeeshan Ali** Field Analyst (Site Team Member 1)  
**Kashif Ali** Field Assistant (Site Team Member 2)

### Monitoring Locations

Sr#	Date	Location	GPS Co-ordinates
1	20-07-2022	Liaquatabad, C-1 Area Opposite Jamia Masjid E Bloach	24°53'38.71"N 67° 2'38.35"E
2	21-07-2022	Liaquatabad, Near Shanza Driving School	24°54'2.97"N 67° 2'43.07"E
3	22-07-2022	Baloch Masjid, No.2 Azizabad Main Road, F.B. Area Bhangoria Goth	24°54'28.58"N 67° 3'45.90"E
4	23-07-2022	Liaquatabad, Underpass Sharifabad, Saleem Khokhar Clinic	24°54'31.50"N 67° 3'10.63"E
5	24-07-2022	Safari Park, University Road	24°55'31.80"N 67° 6'27.25"E
6	25-07-2022	Stadium Road, Indus University, Civic Center	24°54'7.03"N 67° 4'29.53"E



7	26-07-2022	Agha Khan Hospital, Near HBL Bank	24°55'37.93"N 67° 3'52.36"E
8	27-07-2022	Paradise School Gulberg	24°56'25.85"N 67° 4'8.12"E



**Document of Reference**

SEQS 2016 (Sindh Environmental Quality Standards) has been referred as a guideline to measure the results of monitoring related to Ambient Air and Noise . Link of SEQS is given below:

<https://epd.sindh.gov.pk/SEQS>

**Monitoring Findings**

A successful environmental monitoring survey has been conducted at prescribed locations and found out that the major part of the monitoring complies with SEQS 2016. The observations and results are discussed in detail in continuous sheets.



## 2. Description of Monitoring

### 2.1 Objective:

HSE Services deployed aforementioned team at prescribed sites on said dates for 24 hours continuous ambient air monitoring, 24 Hours continuous noise monitoring. The aim of the monitoring is to prepare a comprehensive results of different parameter of environment including ambient air and noise.

### 2.2 Scope of Work:

Scope of Work (SOW) was set up in accordance with the contract awarded by M/s National Engineering Services Pakistan and to M/s HSE Services. For Initial understanding of scope of work, consider the following:

- Ambient Air Monitoring of 24 Hours at 08 different sites, Parameters to be measured are in with accordance of SEQs..
- Noise Monitoring of 24 Hours at the 08 locations . Noise tested in decibels dB (A).

### 2.3 List of Tables:

**Table 2.4.1:** SEQs for Ambient Air Monitoring

**Table 2.4.2:** SEQs for Noise Monitoring



## 2.4 Environmental Monitoring Guidelines

The following sections provide a thorough understanding on environmental aspects.

### 2.4.1 Ambient Air Monitoring

Ambient air monitoring is the systematic, long-term assessment of pollutant levels by measuring the quantity and types of certain pollutants in the surrounding, outdoor air. Reasons to monitor ambient could be;

- assess the extent of pollution;
- provide air pollution data in a timely manner;
- support implementation of air quality standards;
- evaluate the effectiveness of emissions control strategies;
- provide information on air quality trends;
- provide data for the evaluation of air quality models

According to SEQs, following parameters are to be measured in 24 hour monitoring in order to ensure pollutant free air;

Table 2.4.1

S. No.	Parameters	SEQs Limits
1.	Carbon Monoxide CO	5 mg/m <sup>3</sup>
2.	Sulphur Dioxide SO <sub>2</sub>	120 µg/m <sup>3</sup>
3.	Oxides of Nitrogen as NO	40 µg/m <sup>3</sup>
4.	Oxides of Nitrogen as NO <sub>2</sub>	80 µg/m <sup>3</sup>
5.	Particulate Matter PM 10	150 µg/m <sup>3</sup>
6.	Particulate Matter PM 2.5	35 µg/m <sup>3</sup>
7.	Particulate Matters Respirable SPM	500 µg/m <sup>3</sup>
8.	Lead (Pb)	1.5 µg/m <sup>3</sup>
9.	Ozone O <sub>3</sub>	130 µg/m <sup>3</sup>



### 2.4.2 Noise Monitoring

Noise pollution adversely affects the lives of millions of people. Problems related to noise include stress related illnesses, high blood pressure, speech interference, hearing loss, sleep disruption, and lost productivity. Noise Induced Hearing Loss (NIHL) is the most common and often discussed health effect.

According to SEQS, Noisy areas need to be monitored and it is to be ensured that controls are applied in order to maintain sound within below prescribed limits;

Table 2.4.2

SEQS Limit	Industrial Area	Commercial Area	Residential Area	Silence Zone
Day Time	75	65	55	50
Night Time	65	55	45	45

Day Time Hours: 6:00 am to 10:00 pm

Night Time Hours: 10:00 pm to 6:00 am

## 2.5 Methodology:

### 2.5.1 Ambient Air Sampling methodology:

1. Placement of analyzers on a flat table or rack and mounted on it.
2. Made Pneumatic Connections.
3. Connected all the Pneumatic Tubes 1st END at Exhaust Port of Analyzer and 2nd end at the Pump's inlet port
4. Sample inlet of the analyzer was remained open in Ambient Air for auto suction of sample.
5. After all connections, Turned the PUMP on.
6. Waited for 60 Sec. until the Pressure level is maintained inside the analyzers.
7. Turned the Analyzers ON.
8. Waited for few minutes until analyzers are stabilized & start giving readings.
9. Synchronized all the analyzers time even seconds also.
10. Noted down the time when analyzers starts sampling.



11. Performed the desired time Instantaneous hourly Monitoring.

### 2.5.2 Ambient Noise Monitoring Methodology

1. First a point of monitoring is selected to check the ambient noise.
2. A Leq Noise meter is installed on a tripod stand.
3. Leq meter along with tripod stand is placed on point of monitoring.
4. RS 232 cable attached with Leq meter is connected with laptop to store the values.
5. Switched on the laptop and meter.
6. Instantaneously and hourly data logging started.
7. After 24 hour data is saved for report preparation.

### 2.5.3 Monitoring Coordinates:

The locations where measurements were performed were selected based on the agreed TORs with client and which are as follows;

#### Ambient Air and Noise Monitoring Sites & Dates

Sr#	Date	Location	GPS Co-ordinates
1	20-07-2022	Liaquatabad, C-1 Area Opposite Jamia Masjid E Bloach	24°53'38.71"N 67° 2'38.35"E
2	21-07-2022	Liaquatabad, Near Shanza Driving School	24°54'2.97"N 67° 2'43.07"E
3	22-07-2022	Baloch Masjid, No.2 Azizabad Main Road, F.B. Area Bhangoria Goth	24°54'28.58"N 67° 3'45.90"E
4	23-07-2022	Liaquatabad, Underpass Sharifabad, Saleem Khokhar Clinic	24°54'31.50"N 67° 3'10.63"E
5	24-07-2022	Safari Park, University Road	24°55'31.80"N 67° 6'27.25"E
6	25-07-2022	Stadium Road, Indus University, Civic Center	24°54'7.03"N 67° 4'29.53"E
7	26-07-2022	Agha Khan Hospital, Near HBL Bank	24°55'37.93"N 67° 3'52.36"E
8	27-07-2022	Paradise School Gulberg	24°56'25.85"N 67° 4'8.12"E



2.5.4 Monitoring Equipment:

The measurements were performed by using different equipment. The details of the equipment are as follows;

For Ambient Air Monitoring & Noise

Table 2.5.3

S. No	Parameters	Equipment
1.	CO, NO, NO2, SO2, O3	USEPA Certified Analyzers
2.	PM 10/ PM 2.5/ TSP	Light Scattering Analyzer
3.	Lead	Volumetric Air Sampler
4.	Noise	Continuous and Leq Noise Meter

2.5.5 Monitoring Parameters:

Refer Table 2.4.1 – Table 2.4.2

2.5.6 Monitoring Procedure:

Step 1

- Awarding of contract
- Coordination and confirmation of monitoring schedule
- Arrangement and deployment of site team at site

Step 2

- 24 hours continuous monitoring of ambient air at the point and measurement taken on average basis. Equipments were set up at mutually agreed point (as according to the prescribed coordinates) and continuous monitoring of air quality was conducted without any interruption.
- 24 hours continuous monitoring of noise of surroundings and measurement taken on average basis.

Step 3

- Reporting of the results





### 3. Reports

ANQ1

## ENVIRONMENTAL TESTING LABORATORY TEST REPORT

Job No.	HSE/KHI/08-02/2022	Date of Issuance	13-08-2022
<b>Sample Information</b>			
Commodity	Ambient Air Quality & Noise Monitoring	Reference No.	HSE/KHI/IND/243/22
Location	Liaquatabad, C-1 Area Opposite Jamia Masjid E Bloach	Sampling Duration	24 Hours
Co-ordinates	24°53'38.71"N 67° 2'38.35"E	Date of Analysis	20-07-2022
<b>Client/Establishment</b>			
Name	M/s National Engineering Services Pakistan (PVT) Limited		
Address	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

### TEST RESULTS

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	4.63	OK
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	35.6	OK
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	53.08	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	88.76	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	44.69	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	12.54	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>53.45</b>	<b>High</b>
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	96.58	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	484.25	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	72.6	<b>High</b>
		Night-time	8:00 h	55		ASTM E-1124	63.77	<b>High</b>



\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level

**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	10:00 PM	2.6	39.16	68.9	108.06	60.5	-	49	88	460	ND		59
2	11:00 PM	6.7	41.71	65.8	107.51	58.9	-	51	92	463			66
3	12:00 AM	5.1	40.16	71.1	111.26	45.7	-	45	93	469			64
4	1:00 AM	4.8	35.11	62.3	97.41	45.3	-	42	95	471			67
5	2:00 AM	4.1	39.68	56.7	96.38	51.1	-	52	88	473			58
6	3:00 AM	5.2	38.86	52.1	90.96	112.08	-	55	82	460			71
7	4:00 AM	4.7	39.21	54.6	93.81	42.9	-	56	83	469			56
8	5:00 AM	3.9	39	62.4	101.4	46.8	-	59	87	470			63
9	6:00 AM	-	38.36	41.9	80.26	48.9	-	60	95	480			70
10	7:00 AM	-	46.61	54.6	101.21	60.1	-	48	100	490			70
11	8:00 AM	-	32.1	44.1	76.2	58.7	-	43	90	495			69
12	9:00 AM	-	29.8	42.6	72.4	52.6	-	50	102	496			71
13	10:00 AM	-	24.4	48.7	73.1	28.9	-	56	110	495			72
14	11:00 AM	-	31.1	52.1	83.2	26.7	12.11	61	115	470			70
15	12:00 PM	-	34.9	53.6	88.5	23.7	12.6	62	114	480			69
16	1:00 PM	-	33.9	55	88.9	29.1	12.93	64	91	485			68
17	2:00 PM	-	34.6	46.9	81.5	33.2	-	60	99	495			65
18	3:00 PM	-	33.4	47.8	81.2	31.8	-	57	103	501			70
19	4:00 PM	-	41.7	49.2	90.9	35.4	-	58	107	498			89
20	5:00 PM	-	28.7	46.1	74.8	34.4	-	56	108	496			75
21	6:00 PM	-	24.9	52.8	77.7	28.7	-	49	97	488			76
22	7:00 PM	-	38.4	50.4	88.8	36.8	-	48	98	503			72
23	8:00 PM	-	33.7	49.9	83.6	40.5	-	47	92	510			76
24	9:00 PM	-	36.8	44.3	81.1	39.7	-	55	89	505			77
Average		4.6375	35.68	53.08	88.76	44.69	12.5467	53.4583	96.58	484.25		72.6	63.78

\*SEQS: Sindh Environmental Quality Standards

**Comments/Remarks:**

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**ENVIRONMENTAL TESTING LABORATORY****TEST REPORT**

Job No.	HSE/KHI/08-02/2022	Date of Issuance	13-08-2022
<b>Sample Information</b>			
Commodity	Ambient Air Quality & Noise Monitoring	Reference No.	HSE/KHI/IND/244/22
Location	Liaquatabad, Near Shanza Driving School	Sampling Duration	24 Hours
Co-ordinates	24°54'2.97"N 67° 2'43.07"E	Date of Analysis	21-07-2022
<b>Client/Establishment</b>			
Name	M/s National Engineering Services Pakistan (PVT) Limited		
Address	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

**TEST RESULTS**

Sr. No	Parameter	Averaging Time	SEQS*	Unit	Methodology	*Avg. Conc.	Remarks	
1	Carbon Monoxide (CO)	8 h	5	mg/m <sup>3</sup>	NDIR	4.6	OK	
2	Nitrogen Dioxide (NO)	24 h	40	µg/m <sup>3</sup>	Chemiluminescence	25.57	OK	
3	Nitric Oxide (NO <sub>2</sub> )	24 h	80	µg/m <sup>3</sup>	Chemiluminescence	52.49	OK	
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h	120	µg/m <sup>3</sup>	Chemiluminescence	78.06	OK	
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h	120	µg/m <sup>3</sup>	UV-Fluorescence	42.63	OK	
6	Ozone (O <sub>3</sub> )	1 h	130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	12.43	OK	
7	Particulate Matter (PM <sub>2.5</sub> )	24 h	35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>45.12</b>	<b>High</b>	
8	Particulate Matter (PM <sub>10</sub> )	24 h	150	µg/m <sup>3</sup>	Beta- Ray Absorption	78.91	OK	
9	Suspended Particulates (SPM)	24 h	500	µg/m <sup>3</sup>	Gravimetric Sampling	286.79	OK	
10	Lead	24 h	1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK	
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	74.8	<b>High</b>
		Night-time	8:00 h	55		ASTM E-1124	73.66	<b>High</b>

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM µg/m <sup>3</sup>	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	4:00 PM	4.6	25.4	50.91	76.31	39.01	-	45	67	264	ND	70	
2	5:00 PM	5.1	22.31	51.18	73.49	41.11	-	41	70	261		72	
3	6:00 PM	3.2	26.4	53.34	79.74	35.91	-	40	75	274		76	
4	7:00 PM	4.9	26.5	54.11	80.61	42.87	-	46	80	292		59	
5	8:00 PM	3.8	23.3	56.78	80.08	41.56	-	49	79	296		74	
6	9:00 PM	5.7	21.1	50.84	71.94	46.61	-	40	78	276		73	
7	10:00 PM	3.4	23.5	49.41	72.91	42.43	-	41	79	280			77
8	11:00 PM	6.4	24.4	44.42	68.82	45.31	-	42	82	288			79
9	12:00 AM	-	25.6	45.41	71.01	44.17	-	47	79	282			81
10	1:00 AM	-	29.7	44.43	74.13	40.19	-	41	78	278			73
11	2:00 AM	-	28.7	43.56	72.26	41.95	-	42	79	282			71
12	3:00 AM	-	26.6	44.68	71.28	42.51	-	39	79	276			70
13	4:00 AM	-	23.5	46.81	70.31	39.52	-	40	77	274			69
14	5:00 AM	-	28.9	47.76	76.66	35.27	-	39	76	270			71
15	6:00 AM	-	32.2	51.75	83.95	36.23	-	41	73	268			72
16	7:00 AM	-	26.4	52.71	79.11	39.21	-	43	71	264		69	
17	8:00 AM	-	21.3	59.76	81.06	41.29	-	39	72	262		70	
18	9:00 AM	-	23.91	56.7	80.61	45.95	-	45	79	288		73	
19	10:00 AM	-	22.36	55.75	78.11	46.61	-	46	80	292		74	
20	11:00 AM	-	25.67	58.4	84.07	49.64	11.93	49	85	308		79	
21	12:00 PM	-	29.98	61.9	91.88	47.65	12.81	50	89	318		80	
22	1:00 PM	-	27.56	60.71	88.27	49.47	12.56	51	86	314		78	
23	2:00 PM	-	28.36	59.56	87.92	46.41	-	60	91	342		77	
24	3:00 PM	-	20.18	58.95	79.13	42.43	-	67	90	334		79	
Average		4.6375	25.576	52.4929	78.06917	42.6379	12.4333	45.125	78.91667	286.7917		74.8	73.6666

\*SEQS: Sindh Environmental Quality Standards

**Comments/Remarks:**

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**ENVIRONMENTAL TESTING LABORATORY****TEST REPORT**

<b>Job No.</b>	HSE/KHI/08-02/2022	<b>Date of Issuance</b>	13-08-2022
<b>Sample Information</b>			
<b>Commodity</b>	Ambient Air Quality & Noise Monitoring	<b>Reference No.</b>	HSE/KHI/IND/245/22
<b>Location</b>	Baloch Masjid, No.2 Azizabad Main Road, F.B. Area Bhangoria Goth	<b>Sampling Duration</b>	24 Hours
<b>Co-ordinates</b>	24°54'28.58"N 67° 3'45.90"E	<b>Date of Analysis</b>	22-07-2022
<b>Client/Establishment</b>			
<b>Name</b>	M/s National Engineering Services Pakistan (PVT) Limited		
<b>Address</b>	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

**TEST RESULTS**

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	5.9	High
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	23.22	OK
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	60.37	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	83.60	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	30.81	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	12.32	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>42.37</b>	High
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	57.37	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	240.41	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	82.6	High
		Night-time	8:00 h	55		ASTM E-1124	81.4	High

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	1:00 PM	7.1	21.8	56.9	78.7	27.38	11.81	30	45	190	ND	79	
2	2:00 PM	8.6	23.8	52.8	76.6	25.91	-	32	46	196		81	
3	3:00 PM	6.3	28.9	55.1	84	30.92	-	35	51	212		84	
4	4:00 PM	4.2	31.4	54.2	85.6	20.81	-	39	53	224		78	
5	5:00 PM	5.1	24.4	53.1	77.5	21.87	-	40	52	224		85	
6	6:00 PM	4.8	23.7	52.9	76.6	25.71	-	41	56	234		86	
7	7:00 PM	3.9	22.5	54.9	77.4	27.31	-	43	57	240		59	
8	8:00 PM	7.8	26.9	56.1	83	26.35	-	44	61	250		83	
9	9:00 PM	-	33.1	52.8	85.9	24.4	-	46	63	258		82	
10	10:00 PM	-	29.8	51.1	80.9	30.96	-	47	59	252			86
11	11:00 PM	-	24.4	61.8	86.2	31.21	-	45	65	260			84
12	12:00 AM	-	19.9	66.7	86.6	33.17	-	42	61	240			81
13	1:00 AM	-	21.5	64.9	86.4	34.14	-	43	64	254			85
14	2:00 AM	-	20.5	65.1	85.6	36.16	--	41	67	256			87
15	3:00 AM	-	23.4	63.5	86.9	33.91	-	44	61	250			81
16	4:00 AM	-	22.6	67.9	90.5	31.96	-	45	57	244			78
17	5:00 AM	-	26.5	64.7	91.2	31.71	-	46	56	232			75
18	6:00 AM	-	15.9	66.1	82	35.54	-	42	54	225			76
19	7:00 AM	-	19.2	70.2	89.4	31.41	-	41	52	230			79
20	8:00 AM	-	18.7	71.3	90	35.47	-	40	55	252			82
21	9:00 AM	-	19.7	69.4	89.1	36.17	-	47	59	262			84
22	10:00 AM	-	18.6	61.1	79.7	34.14	-	50	61	258			85
23	11:00 AM	-	20.5	55.8	76.3	37.31	12.51	49	60	254			87
24	12:00 PM	-	19.7	60.7	80.4	35.59	12.64	45	62	273			80

5.975 23.225 60.3791 83.60417 30.8129 12.32 42.375 57.375 240.4167 82.6 81.4444

\*SEQS: Sindh Environmental Quality Standards

**Comments/Remarks:**

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## ENVIRONMENTAL TESTING LABORATORY

### TEST REPORT

Job No.	HSE/KHI/08-02/2022	Date of Issuance	13-08-2022
<b>Sample Information</b>			
Commodity	Ambient Air Quality & Noise Monitoring	Reference No.	HSE/KHI/IND/246/22
Location	Liaquatabad, Underpass Sharifabad, Saleem Khokhar Clinic	Sampling Duration	24 Hours
Co-ordinates	24°54'31.50"N 67° 3'10.63"E	Date of Analysis	23-07-2022
<b>Client/Establishment</b>			
Name	M/s National Engineering Services Pakistan (PVT) Limited		
Address	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

### TEST RESULTS

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	6.0	High
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	33.97	OK
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	54.56	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	88.53	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	25.11	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	11.68	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>41.41</b>	High
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	64.20	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	255.3	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	80.66	High
		Night-time	8:00 h	55		ASTM E-1124	76.77	High

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	10:00 AM	5.1	24.1	55.8	79.9	34.25	-	41	75	259	ND	78	
2	11:00 AM	5.2	34.2	54.2	88.4	36.21	11.59	45	67	264		80	
3	12:00 PM	5.6	36.8	45.7	82.5	25.8	11.68	48	69	248		82	
4	1:00 PM	5.7	35.7	57.8	93.5	22.1	11.77	39	66	311		79	
5	2:00 PM	6.1	31.2	56.8	88	28.7	-	34	64	228		83	
6	3:00 PM	6.2	37.6	54.1	91.7	26.5	-	35	69	258		84	
7	4:00 PM	7.5	38.1	52.3	90.4	24.2	-	38	65	214		79	
8	5:00 PM	6.8	35.6	54.9	90.5	22.45	-	39	68	235		81	
9	6:00 PM	-	32.1	65.1	97.2	31.22	-	37	66	256		83	
10	7:00 PM	-	42.1	66.3	108.4	30.24	-	38	59	215		84	
11	8:00 PM	-	41.5	62.5	104	18.9	-	41	58	238		83	
12	9:00 PM	-	39.1	51.8	90.9	20.56	-	46	51	248		85	
13	10:00 PM	-	38.2	53.7	91.9	23.57	-	45	56	268			89
14	11:00 PM	-	36.4	59.7	96.1	24.15	--	39	78	315			88
15	12:00 AM	-	35.1	54.3	89.4	21.11	-	37	71	324			86
16	1:00 AM	-	32.6	51.6	84.2	21.47	-	45	59	248			82
17	2:00 AM	-	29.1	55.8	84.9	23.54	-	49	61	260			75
18	3:00 AM	-	29.5	59.7	89.2	29.1	-	47	60	254			72
19	4:00 AM	-	30.1	45.8	75.9	19.8	-	40	57	314			65
20	5:00 AM	-	31.5	49.8	81.3	22.5	-	38	59	213			63
21	6:00 AM	-	32.1	47.3	79.4	24.8	-	42	65	268			71
22	7:00 AM	-	30.8	46.6	77.4	23.1	-	46	64	209			74
23	8:00 AM	-	31.1	52.1	83.2	26.1	-	44	68	247			75
24	9:00 AM	-	30.8	55.8	86.6	22.3	-	41	66	235			80
Average		6.025	33.97	54.562	88.5375	25.111	11.68	41.416	64.208	255.37		80.666	76.777

\*SEQS: Sindh Environmental Quality Standards

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**ENVIRONMENTAL TESTING LABORATORY**  
**TEST REPORT**

<b>Job No.</b>	HSE/KHI/08-02/2022	<b>Date of Issuance</b>	13-08-2022
<b><u>Sample Information</u></b>			
<b>Commodity</b>	Ambient Air Quality & Noise Monitoring	<b>Reference No.</b>	HSE/KHI/IND/247/22
<b>Location</b>	Safari Park, University Road	<b>Sampling Duration</b>	24 Hours
<b>Co-ordinates</b>	24°55'31.80"N 67° 6'27.25"E	<b>Date of Analysis</b>	24-07-2022
<b><u>Client/Establishment</u></b>			
<b>Name</b>	M/s National Engineering Services Pakistan (PVT) Limited		
<b>Address</b>	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

**TEST RESULTS**

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	4.29	OK
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	35.1	OK
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	48.4	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	83.4	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	25.5	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	10.7	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>41.6</b>	<b>High</b>
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	62.4	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	254.6	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	66.5	<b>High</b>
		Night-time	8:00 h	55		ASTM E-1124	64.6	<b>High</b>

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	10:00 AM	4.9	23.8	51.1	74.9	32.41	-	45	71	256	ND	65	
2	11:00 AM	5.3	42.8	50.6	93.4	33.74	10.89	46	65	261		77	
3	12:00 PM	4.8	38.7	41.9	80.6	26.89	9.84	46	67	245		65	
4	1:00 PM	4.6	33.5	54.1	87.6	23.7	11.32	41	72	298		64	
5	2:00 PM	4.1	31.1	44.2	75.3	29.4	-	33	63	231		66	
6	3:00 PM	3.2	37.6	42.9	80.5	25.7	-	38	67	257		65	
7	4:00 PM	2.5	38.1	38.7	76.8	24.2	-	37	66	213		61	
8	5:00 PM	4.9	35.6	42.8	78.4	21.89	-	37	69	238		72	
9	6:00 PM	-	32.1	55.4	87.5	36.5	-	33	65	256		68	
10	7:00 PM	-	44.1	56.2	100.3	31.28	-	34	55	217		69	
11	8:00 PM	-	41.5	53.1	94.6	19.7	-	36	56	231		63	
12	9:00 PM	-	37.1	49.7	86.8	21.9	-	49	53	249		66	
13	10:00 PM	-	38.2	45.8	84	23.57	-	51	55	260			64
14	11:00 PM	-	36.4	46.5	82.9	25.8	--	41	74	227			66
15	12:00 AM	-	32.8	44.6	77.4	22.9	-	42	73	298			63
16	1:00 AM	-	32.6	42.1	74.7	23.8	-	44	56	287			61
17	2:00 AM	-	33.5	52.6	86.1	22.64	-	46	59	260			67
18	3:00 AM	-	36.4	51.1	87.5	29.1	-	48	53	231			66
19	4:00 AM	-	29.7	57.3	87	18.7	-	40	54	311			62
20	5:00 AM	-	35.7	49.8	85.5	21.5	-	38	51	289			64
21	6:00 AM	-	33.4	47.3	80.7	23.6	-	42	62	274			68
22	7:00 AM	-	31.9	47.4	79.3	22.8	-	45	63	215			65
23	8:00 AM	-	34.8	45.9	80.7	25.4	-	41	67	257			69
24	9:00 AM	-	29.8	49.7	79.5	23.7	-	46	62	249			62
Average		4.29	35.1	48.4	83.4	25.5	10.7	41.6	62.4	254.6		66.5	64.6

\*SEQS: Sindh Environmental Quality Standards

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## ENVIRONMENTAL TESTING LABORATORY

### TEST REPORT

Job No.	HSE/KHI/08-02/2022	Date of Issuance	13-08-2022
<b>Sample Information</b>			
Commodity	Ambient Air Quality & Noise Monitoring	Reference No.	HSE/KHI/IND/248/22
Location	Stadium Road, Indus University, Civic Center	Sampling Duration	24 Hours
Co-ordinates	24°54'7.03"N 67° 4'29.53"E	Date of Analysis	25-07-2022
<b>Client/Establishment</b>			
Name	M/s National Engineering Services Pakistan (PVT) Limited		
Address	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

### TEST RESULTS

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	4.75	OK
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	37.1	OK
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	48.4	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	51.1	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	27.4	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	11.6	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>43.5</b>	<b>High</b>
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	66.8	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	264	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	64.1	<b>High</b>
		Night-time	8:00 h	55		ASTM E-1124	60.4	<b>High</b>

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	10:30 AM	3.8	22.7	55.6	78.3	33.21	-	46	69	311	ND	61	
2	11:30 AM	4.1	41.8	56.9	98.7	35.78	11.58	47	61	278		71	
3	12:30 PM	4.8	35.7	44.8	80.5	33.86	10.89	45	71	259		63	
4	1:30 PM	4.7	30.8	52.1	82.9	22.71	12.31	38	76	234		70	
5	2:30 PM	5.1	33.9	55.2	89.1	31.1	-	41	65	256		71	
6	3:30 PM	5.4	40.6	45.9	86.5	25.7	-	44	77	257		68	
7	4:30 PM	3.9	38.1	48.7	86.8	26.8	-	41	69	214		59	
8	5:30 PM	6.2	33.7	45.6	79.3	23.5	-	39	61	245		64	
9	6:30 PM	-	36.6	47.8	84.4	33.8	-	40	63	247		66	
10	7:30 PM	-	40.8	58.9	99.7	32.7	-	39	58	231		59	
11	8:30 PM	-	39.7	57.3	97	20.9	-	42	71	265		54	
12	9:30 PM	-	33.6	51.9	85.5	23.6	-	49	69	268		62	
13	10:30 PM	-	34.9	45.8	80.7	24.71	-	51	65	259			61
14	11:30 PM	-	38.7	49.7	88.4	22.5	--	41	71	238			58
15	12:30 AM	-	41.1	50.1	91.2	24.56	-	44	73	312			57
16	1:30 AM	-	42.6	51.6	94.2	26.8	-	46	64	325			55
17	2:30 AM	-	41.9	53.8	95.7	28.7	-	47	57	278			59
18	3:30 AM	-	44.6	51.1	95.7	31.2	-	48	59	265			62
19	4:30 AM	-	38.4	57.3	95.7	21.2	-	40	53	297			65
20	5:30 AM	-	35.5	49.8	85.3	23.5	-	38	72	301			63
21	6:30 AM	-	33.2	48.1	81.3	27.8	-	46	76	289			64
22	7:30 AM	-	42.5	44.8	87.3	26.9	-	44	68	221		61	
23	8:30 AM	-	33.7	52.1	85.8	26.3	-	39	71	235		62	
24	9:30 AM	-	36.4	51.3	87.7	28.7	-	49	65	251		70	
Average		4.75	37.1	51.1	88.2	27.4	11.6	43.5	66.8	264.0		64.1	60.4

\*SEQS: Sindh Environmental Quality Standards

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## ENVIRONMENTAL TESTING LABORATORY

### TEST REPORT

Job No.	HSE/KHI/08-02/2022	Date of Issuance	13-08-2022
<b>Sample Information</b>			
Commodity	Ambient Air Quality & Noise Monitoring	Reference No.	HSE/KHI/IND/249/22
Location	Agha Khan Hospital, Near HBL Bank	Sampling Duration	24 Hours
Co-ordinates	24°55'37.93"N 67° 3'52.36"E	Date of Analysis	26-07-2022
<b>Client/Establishment</b>			
Name	M/s National Engineering Services Pakistan (PVT) Limited		
Address	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

### TEST RESULTS

Sr. No	Parameter	Averaging Time		SEQS*	Unit	Methodology	*Avg. Conc.	Remarks
1	Carbon Monoxide (CO)	8 h		5	mg/m <sup>3</sup>	NDIR	4.73	OK
2	Nitrogen Dioxide (NO)	24 h		40	µg/m <sup>3</sup>	Chemiluminescence	41.8	High
3	Nitric Oxide (NO <sub>2</sub> )	24 h		80	µg/m <sup>3</sup>	Chemiluminescence	53.4	OK
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h		120	µg/m <sup>3</sup>	Chemiluminescence	95.2	OK
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h		120	µg/m <sup>3</sup>	UV-Fluorescence	28.8	OK
6	Ozone (O <sub>3</sub> )	1 h		130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	12.4	OK
7	Particulate Matter (PM <sub>2.5</sub> )	24 h		35	µg/m <sup>3</sup>	Beta- Ray Absorption	51.2	High
8	Particulate Matter (PM <sub>10</sub> )	24 h		150	µg/m <sup>3</sup>	Beta- Ray Absorption	63.9	OK
9	Suspended Particulates (SPM)	24 h		500	µg/m <sup>3</sup>	Gravimetric Sampling	283.1	OK
10	Lead	24 h		1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	67.8	High
		Night-time	8:00 h	55		ASTM E-1124	60.8	High

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM (µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	11:00 AM	4.2	25.8	60.8	86.6	36.9	-	51	71	321	ND	61	
2	12:00 PM	4.6	49.2	61.2	110.4	41.7	12.52	54	76	285		68	
3	1:00 PM	4.9	39.5	59.8	99.3	35.1	10.71	47	68	254		61	
4	2:00 PM	5.1	36.7	52.1	88.8	25.6	13.84	49	65	269		69	
5	3:00 PM	3.7	41.1	55.2	96.3	32.5	-	52	64	254		61	
6	4:00 PM	5.6	41.6	52.1	93.7	27.8	-	49	69	236		62	
7	5:00 PM	4.4	46.8	53.1	99.9	29.7	-	56	62	214		68	
8	6:00 PM	5.3	45.9	56.9	102.8	26.7	-	45	63	256		69	
9	7:00 PM	-	44.3	45.8	90.1	35.1	-	57	68	258		71	
10	8:00 PM	-	41.9	55.2	97.1	36.7	-	52	58	247		72	
11	9:00 PM	-	42.3	54.1	96.4	23.6	-	44	51	269		73	
12	10:00 PM	-	43.6	53.1	96.7	24.9	-	53	52	231		75	
13	11:00 PM	-	41.9	49.5	91.4	21.2	-	58	58	216			62
14	12:00 AM	-	39.8	48.7	88.5	23.3	--	49	59	247			65
15	1:00 AM	-	42.8	51.1	93.9	27.4	-	47	55	325			58
16	2:00 AM	-	43.7	53.4	97.1	26.1	-	41	59	365			54
17	3:00 AM	-	42.6	54.6	97.2	25.4	-	43	64	345			59
18	4:00 AM	-	44.6	52.4	97	29.6	-	51	67	387			62
19	5:00 AM	-	37.1	57.8	94.9	28.7	-	56	59	315			63
20	6:00 AM	-	39.7	52.9	92.6	26.1	-	57	54	325			65
21	7:00 AM	-	36.8	49.8	86.6	28.4	-	53	77	326			59
22	8:00 AM	-	43.7	46.7	90.4	23.5	-	54	75	298			66
23	9:00 AM	-	45.5	50.2	95.7	22.4	-	56	71	284			68
24	10:00 AM	-	46.2	54.8	101	31.6	-	54	69	268			73
Average		4.73	41.8	53.4	95.2	28.8	12.4	51.2	63.9	283.1		67.8	60.8

\*SEQS: Sindh Environmental Quality Standards

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**ENVIRONMENTAL TESTING LABORATORY****TEST REPORT**

<b>Job No.</b>	HSE/KHI/08-02/2022	<b>Date of Issuance</b>	13-08-2022
<b>Sample Information</b>			
<b>Commodity</b>	Ambient Air Quality & Noise Monitoring	<b>Reference No.</b>	HSE/KHI/IND/250/22
<b>Location</b>	Paradise School Gulberg	<b>Sampling Duration</b>	24 Hours
<b>Co-ordinates</b>	24°56'25.85"N 67° 4'8.12"E	<b>Date of Analysis</b>	27-07-2022
<b>Client/Establishment</b>			
<b>Name</b>	M/s National Engineering Services Pakistan (PVT) Limited		
<b>Address</b>	NESPAK HOUSE: 1-C, Block-N, Model Town Extension Lahore		

**TEST RESULTS**

Sr. No	Parameter	Averaging Time	SEQS*	Unit	Methodology	*Avg. Conc.	Remarks	
1	Carbon Monoxide (CO)	8 h	5	mg/m <sup>3</sup>	NDIR	3.63	OK	
2	Nitrogen Dioxide (NO)	24 h	40	µg/m <sup>3</sup>	Chemiluminescence	37.1	OK	
3	Nitric Oxide (NO <sub>2</sub> )	24 h	80	µg/m <sup>3</sup>	Chemiluminescence	56.5	OK	
4	Oxides of Nitrogen (NO <sub>x</sub> )	24 h	120	µg/m <sup>3</sup>	Chemiluminescence	93.6	OK	
5	Sulfur Dioxide (SO <sub>2</sub> )	24 h	120	µg/m <sup>3</sup>	UV-Fluorescence	29.9	OK	
6	Ozone (O <sub>3</sub> )	1 h	130	µg/m <sup>3</sup>	Non-Dispersive UV Absorption Method	13.8	OK	
7	Particulate Matter (PM <sub>2.5</sub> )	24 h	35	µg/m <sup>3</sup>	Beta- Ray Absorption	<b>48.6</b>	<b>High</b>	
8	Particulate Matter (PM <sub>10</sub> )	24 h	150	µg/m <sup>3</sup>	Beta- Ray Absorption	67.8	OK	
9	Suspended Particulates (SPM)	24 h	500	µg/m <sup>3</sup>	Gravimetric Sampling	299.3	OK	
10	Lead	24 h	1.5	µg/Nm <sup>3</sup>	AAS Method	BDL*	OK	
11	Noise	Day-time	16:00 h	65	dB (A)	ASTM E-1124	61	OK
		Night-time	8:00 h	55		ASTM E-1124	65	<b>High</b>

\*For Detailed Monitoring Results Please see **Log Table**

\*BDL: Below detection Level



**24 Hour Monitoring Data for Ambient Air**

**Log Table**

Sr No	Time	CO (mg/m <sup>3</sup> )	NO (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	O <sub>3</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	PM <sub>10</sub> (µg/m <sup>3</sup> )	SPM µg/m <sup>3</sup> )	Lead (µg/m <sup>3</sup> )	Noise ( dB)	
												Day	Night
1	10:00 AM	3.1	31.9	61.8	93.7	38.9	-	55	75	357	ND	57	
2	11:00 AM	3.4	33.4	62.3	95.7	36.4	13.55	59	65	325		59	
3	12:00 PM	4.4	41.1	58.7	99.8	32.4	12.84	45	64	329		54	
4	1:00 PM	3.2	38.9	57.4	96.3	33.1	14.95	49	69	312		56	
5	2:00 PM	3.9	33.7	56.2	89.9	31.5	-	42	71	326		66	
6	3:00 PM	4.1	34.2	54.9	89.1	30.4	-	46	68	289		64	
7	4:00 PM	3.6	37.4	61.2	98.6	32.4	-	45	77	247		61	
8	5:00 PM	3.3	41.9	66.2	108.1	33.5	-	54	72	236		63	
9	6:00 PM	-	33.6	65.3	98.9	29.7	-	46	66	245		68	
10	7:00 PM	-	42.9	67.9	110.8	28.6	-	41	64	258		67	
11	8:00 PM	-	39.4	58.9	98.3	25.8	-	42	59	268		62	
12	9:00 PM	-	38.4	59.8	98.2	24.6	-	51	51	321		66	
13	10:00 PM	-	36.2	44.6	80.8	22.1	-	56	63	357			66
14	11:00 PM	-	34.5	46.3	80.8	26.8	--	58	64	349			61
15	12:00 AM	-	32.8	49.8	82.6	25.9	-	51	68	367			63
16	1:00 AM	-	33.9	47.6	81.5	24.3	-	49	66	329			68
17	2:00 AM	-	42.6	49.8	92.4	26.7	-	47	75	216			67
18	3:00 AM	-	39.7	51.1	90.8	31.1	-	41	71	235			64
19	4:00 AM	-	34.5	52.6	87.1	32.8	-	43	76	398			71
20	5:00 AM	-	33.7	54.3	88	35.7	-	49	69	387			68
21	6:00 AM	-	36.9	52.6	89.5	29.8	-	55	67	248			58
22	7:00 AM	-	34.8	56.7	91.5	26.8	-	45	65	259			59
23	8:00 AM	-	41.6	60.8	102.4	26.4	-	48	64	246			54
24	9:00 AM	-	42.3	58.7	101	30.8	-	50	78	279			59
Average		3.63	37.1	56.5	93.6	29.9	13.8	48.6	67.8	299.3		61.0	65.1

\*SEQS: Sindh Environmental Quality Standards

**Comments/Remarks:**

- The client is responsible for lawful usage of reported data in future.
- This report is not valid for any negotiation or judicial use.
- The measurement results based on the time of monitoring.
- Results relate only to the items tested without prejudice.
- This test report shall not be reproduced except in full, without written approval of the Laboratory.





## 4. Photolog





## **5. Findings:**

Reference to the aforementioned observations, it is found that overall monitoring was conducted successfully at respected points without any significant interruption. Mostly parameters of Ambient Air & Noise are not in compliance with SEQs prescribed standards. Especially PM<sub>2.5</sub> and noise were exceeding the prescribed limit of SEQs at every location.

## **6. Conclusion:**

Environmental monitoring reveals that most of the parameters of Ambient Air are not in compliance with SEQs standards.

Noise is also exceeding the SEQs range. So mitigation measures are required for betterment of environment according to each parameter.

**Analyzed By:**  
(Field Analyst)

**Prepared By:**  
(Assistant Analyst)

**Verified By:**  
(Chemist)

HSE Services

**Date of Issue:** August 13 , 2022

# **ENVIRONMENTAL MONITORING AND TESTING REPORT 2022**

## **Waste Water and Ground Water Testing Reports**

### ***Project***

**Environmental and Social Safeguard Studies for Priority Sewer Network**

**Rehabilitation**

### **HSE Services**

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## 1. Description of Project

<b>Project Name</b>	Environmental and Social Safeguard Studies for Priority Sewer Network Rehabilitation
<b>Project Type</b>	Waste Water & Drinking/Ground Water Sampling & Analysis.
<b>Laboratory Name</b>	M/s HSE Services
<b>Laboratory Address</b>	209-210-B 2 <sup>nd</sup> Floor Phase II, Dhedhi Busines Ave, Plot E-2, State Avenue Road, S.I.T.E Karachi.
<b>Client Name</b>	M/s National Engineering Services Pakistan Pvt. Ltd.
<b>Client Address</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore

## Consultant's Team Details

Mr. M Tahir Ul Amin Field Analyst (Site Team Member 1)

Mr. Zeeshan Ali Field Analyst (Site Team Member 2)

## Monitoring Locations

### **Ground Water Sampling Points**

Sr	Sampling location	Sampling point	GPS
1	Jama Masjid Qadria, Liaquatabad	Tap	24°53'53.18"N 67° 2'41.40"E
2	Jama Masjid Nayab, Liaquatabad	Tap	24°54'4.04"N 67° 2'40.39"E
3	Balouch Masjid	Tap	24°54'27.78"N 67° 3'42.09"E



4	Rizwan Masjid, Liaquatabad	Tap	24°54'29.95"N 67° 3'12.91"E
5	Bait ul Mkkaram Masjid, Safari Park	Tap	24°54'23.59"N 67° 4'57.57"E
6	Roshan Masjid, Stadium Road	Tap	24°55'9.25"N 67° 5'59.70"E
7	Jamia Masjid, Agha Khan Hospital	Tap	24°56'9.56"N 67° 3'56.31"E
8	Jamia Masjid, Paradise School	Tap	24°55'43.06"N 67° 4'30.44"E

**Wastewater Composite Sampling Points**

Sr	Sampling location	Sampling point	GPS
1	C-1 Area, Drain Teen Hatti Bridge, Liaquatabad	Drain	24°53'35.41"N 67° 2'38.62"E
2	Near Jamal Homes Clinic, Near Shanza Liaquatabad	Manhole	24°53'47.73"N 67° 2'41.28"E
3	Baloch Masjid Near Madaras	Drain	24°54'27.20"N 67° 3'53.37"E
4	Near Iqbal Autos, Underpass Liaquatabad	Manhole	24°54'30.38"N 67° 3'18.31"E
5	Ahmed Street, Safari Park	Manhole	24°55'40.63"N 67° 6'52.64"E
6	Near Blossom H.S, Stadium Road	Manhole	24°54'10.24"N 67° 4'26.16"E
7	Agha Khan Hospital	Manhole	24°54'59.22"N 67° 4'43.08"E
8	Gulberg	Manhole	24°55'59.85"N 67° 4'6.00"E

**Document of Reference**

SEQS 2016 (Sindh Environmental Quality Standard) has been referred as a guideline to measure the results of monitoring.

b. References for Sampling

c. References for Testing Methods



**Monitoring Findings**

A successful environmental monitoring survey has been conducted at prescribed locations and found that the major part of the monitoring not complies with SEQS 2016. The observations and results are discussed in detail in continuous sheets.



## **2. Description of Monitoring**

### 2.1 Objective:

HSE Services deployed aforementioned team at prescribed sites on said dates for 24 hour Composite Waste water and Ground Water Sampling & Analysis respectively.

### 2.2 Scope of Work:

Scope of Work (SOW) was set up in accordance with the contract awarded by M/s NESPAK to M/s HSE Services:

- Ground Water ,Wastewater sampling at site and Analysis of parameters in accordance with SEQS.
- Reporting of the results and observation

### 2.3 List of Tables:

**Table 2.4.1:** SEQS Limits for Drinking/Ground Water

**Table 2.4.2 :**SEQS Limits for Waste Water

**Table 2.5.1:** Instrument Description Water sampling

## **2.4 Environmental Monitoring Guidelines**

The following sections provide a thorough understanding on environmental aspects related to the:

- a) Ground Water/ Drinking Water
- b) Wastewater

### 2.4.1 Drinking Water

Safe and readily available water is important for public health, whether it is used for drinking, domestic use, food production or recreational purposes. Contaminated water and poor sanitation are linked to transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks.





In order to prevent diseases and mitigate human health risks, SEQS 2010 regulates following safe drinking water limits;

**Table 2.4.1**

<b>S. No.</b>	<b>Parameters</b>	<b>SEQS Limits</b>
1.	pH	6.5-8.5
2.	Total Dissolved Solids	<1000 (mg/L)
3.	Phenolic compound	0.002 (mg/L)
4.	Chloride	<250 (mg/L)



5.	Total Hardness as CaCO <sub>3</sub>	<500 (mg/L)
6.	Aluminum	0.2 (mg/L)
7.	Residual Chlorine	0.2-0.5
8.	Antimony	<0.005 (mg/L)
9.	Arsenic	0.05 (mg/L)
10.	Taste	Non-Objectionable
11.	Odour	Non-Objectionable
12.	Barium	0.7 (mg/L)
13.	Boron	0.3 (mg/L)
14.	Copper	0.2 (mg/L)
15.	Lead	<0.05 (mg/L)
16.	Mercury	<0.001 (mg/L)
17.	Nickel	0.02 (mg/L)
18.	Manganese	0.5 (mg/L)
19.	Zinc	<5 (mg/L)
20.	Selenium	0.01 (mg/L)
21.	Cyanide	0.05 (mg/L)
22.	Chromium	<0.05 (mg/L)
23.	Fluoride	1.5 (mg/L)
24.	Cadmium	0.01 (mg/L)
25.	Nitrate	0.5 (mg/L)
26.	Nitrite	3 (mg/L)
27.	Color	<15 TCU
28.	Turbidity	<5 NTU
29.	Total Coliform	0/100 ml
30.	Escherichia Coliform	0/100 ml
31.	Pesticides	0.15 (mg/L)



2.4.2 Wastewater

Wastewater refers to treated water or untreated water that flows out of a treatment plant, sewer, or industrial outfall. Generally, it refers to wastes discharged into surface waters. Effluent is generally considered to be water pollution such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities or domestically discharged water. In order to restrict communities for safe disposal of effluent into surface water, SEQS have stated following limits;

Table 2.4.2

S. No	Parameters	SEQS Limits
1.	pH	6 – 9
2.	Biological Oxygen Demand	80 (mg/L)
3.	Chemical Oxygen Demand	150 (mg/L)
4.	Total Dissolved Solids	3500 (mg/L)
5.	Total Suspended Solids	200 (mg/L)
6.	Oil & Grease	10 (mg/L)
7.	Chloride	1000 (mg/L)
8.	Phenolic compound	0.1 (mg/L)
9.	Fluoride	10 (mg/L)
10.	Anionic Detergent	20 (mg/L)
11.	Selenium	0.5 (mg/L)
12.	Sulphide	1 (mg/L)
13.	Ammonia	40 (mg/L)
14.	Cadmium	0.1 (mg/L)
15.	Chromium	1 (mg/L)
16.	Copper	1 (mg/L)
17.	Lead	0.5 (mg/L)
18.	Mercury	0.01 (mg/L)
19.	Nickel	1 (mg/L)
20.	Silver	1 (mg/L)



21.	Zinc	5 (mg/L)
22.	Total Iron	8 (mg/L)

23.	Manganese	1.5
24.	Boron	6 (mg/L)
25.	Sulphate	600 (mg/L)
26.	Arsenic	1 (mg/L)
27.	Chlorine	1 (mg/L)
28.	Total Toxic Metals	2 (mg/L)
29.	Barium	1.5
30.	Cyanide	1
31.	Temperature	40± ≤03°C

## 2.5 Methodology

### 2.5.1 Water Sampling Methodology:

Following methodology was adopted for water sampling and analysis:

#### 2.5.1.1 Sample Collection

The water samples were collected from identified sampling points. Wastewater was sampled by composite method of 24 liters with liter/hour rate in 24 hours to get a representative sample of whole day and night at point. While Ground water was sampled via grab sampling. The sampling was carried out in accordance to the Standard Operating Procedures (SOP) based on the recognized methods of United State Environmental Protection Agency (USEPA), World Health Organization (WHO) and American Public Health Association (APHA) for water sampling and analysis.

#### 2.5.1.2 Preservation

Preservation is important in order to minimize the changes in the sample. The collected water samples were preserved in appropriate containers as per APHA Guidelines, the method of which is given as under:-



Samples were preserved below pH -2 by addition of sulphuric acid and stored below 4 °C.

**2.5.1.3 Sample Identification and Chain of Custody**

The collected samples were labeled and assigned a unique sample identification number, along with sampling date and time of collection. All the relevant information (sample location, time of collection, sample identification, temperature, collected by, preservation techniques etc.) was recorded immediately on the Chain of Custody form signed by HSE Services field Analyst.

**2.5.1.4 Transportation**

Ice box filled with ice, maintained at temperature 4°C ±5°C was used for transporting the sample from the collection site to the environmental laboratory.

**2.5.2 Monitoring Equipment:**

The measurements were performed by using different equipment. The details of the equipment are as follows;

**Table 2.5.1: Equipment For Water Sampling & Analysis**

S. No	Parameters	Equipment
1.	Drinking Water SEQS 2016	Site Sampling and Lab Analysis as per *APHA & **ASTM Methods
2.	Waste Water SEQS 2016	Site Sampling and Lab Analysis as per *APHA & **ASTM Methods

\*APHA stands for American Public Health Association

\*\*American Society for Testing & Materials

**2.5.3 Monitoring Parameters:**

Refer **Table 2.4.1-2.4.2**

**2.5.4 Monitoring Procedure:**



**Step 1**

- Awarding of contract
- Coordination and confirmation of monitoring schedule
- Arrangement and deployment of site team at site

**Step 2**

- 24 hours composite sampling of waste water and grab sampling of ground water at the end of each composite sampling point at the point and measurement taken on average basis.
- Team were set up at agreed point (as according to the prescribed coordinates) and composite and grab monitoring of wastewater and ground water quality was conducted respectively without any interruption.
- Water samples collected from site and preserved samples in ice boxes to maintain the temperature until delivery to laboratory.

**Step 3**

- Reporting of the results



## Waste Water Testing Reports

### Waste Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/JULY/WW /1570/-01	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Monday, July 25, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	C-1 Area, Drain Teen Hatti Bridge, Liaquatabad
<b>Sampling Point</b>	Drain	<b>Co-ordinates</b>	24°53'35.41"N 67° 2'38.62"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Address</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 °C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.35
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1806
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>370</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>119</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	76
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	682.94
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.54
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	<b>20</b>
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.81
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	111
14	Sulfide	S <sup>-2</sup> mg/L)	Lovibond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.67
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.04
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.24
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	0.01



20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND
21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.18
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.11
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.05
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.15
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

**Comments/Remarks:**

- The client is responsible for lawful usage of reported data in future.
- This report is not valid for any negotiation or judicial use.
- The measurement results based on the time of monitoring.
- Results relate only to the items tested without prejudice.
- This test report shall not be reproduced except in full, without written approval of the Laboratory.





**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/W W/1570/-02	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Tuesday, July 26, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Near Jamal Homes Clinic, Near Shanza Liaquatabad
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°53'47.73"N 67° 2'41.28"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extention, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 °C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.45
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1628
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>372</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>120</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	83
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	791.13
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.52
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	10
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.70
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	123
14	Sulfide	S <sup>-2</sup> mg/L)	Lovibond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.86
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.12
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.23
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND



21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.19
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.12
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.05
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.14
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

**Comments/Remarks:**

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/1570/-03	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Wednesday, July 27, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Baloch Masjid Near Madaras
<b>Sampling Point</b>	Drain	<b>Co-ordinates</b>	24°54'27.20"N 67° 3'53.37"E
<b>Client Name</b>	<b>M/s NESPAK Pvt. Ltd</b>		
<b>Client Adress</b>	<b>Nespak House: 1-C, Block N, Model Town Extension, Lahore</b>		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ± 03 °C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.81
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1904
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>795</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>257</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	86
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	723.53
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.61
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	<b>20</b>
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.76
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	124
14	Sulfide	S <sup>-2</sup> mg/L)	Lovlbond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.85
16	Cadmium	Cd <sup>-2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.017
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.13
19	Lead	Pb <sup>.2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni <sup>.2</sup> (mg/L)	Lovibond-255	1.0	ND



21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.21
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.13
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.06
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.17
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

**Comments/Remarks:**

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/1570/-04	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Thursday, July 28, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Near Iqbak Autos, Underpass Liaquatabad
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°54'30.38"N 67° 3'18.31"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 °C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.88
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1809
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>396</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>127</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	88
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	812.67
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.55
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	<b>15</b>
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.69
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	131
14	Sulfide	S <sup>-2</sup> mg/L	Lovibond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.79
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.011
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.21
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND



21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.16
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.15
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.05
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.12
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/15 70/-05	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Friday, July 29, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Ahmed Street, Safari Park
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°55'40.63"N 67° 6'52.64"E
<b>Client Name</b>	<b>M/s NESPAK Pvt. Ltd</b>		
<b>Client Address</b>	<b>Nespak House: 1-C, Block N, Model Town Extension, Lahore</b>		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 ° C	29
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	6.6
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	981
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>543</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>175</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	81
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	334.74
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.53
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	<b>15</b>
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.45
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	149
14	Sulfide	S <sup>-2</sup> mg/L)	Lovibond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.88
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.013
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.24
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND



21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.14
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.12
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.05
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.13
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/1 570/-06	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Saturday, July 30, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Near Blossom H.S, Stadium Road
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°54'10.24"N 67° 4'26.16"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03 ° C	29
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.21
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1807
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>457</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>147</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	93
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	472.85
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.81
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	10
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.37
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	135
14	Sulfide	S <sup>-2</sup> mg/L)	Lovlbond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.96
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.015
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.26
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND



21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.16
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.15
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.04
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.11
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/15 70/-07	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Sunday, July 31, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Agha Khan Hospital
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°54'59.22"N 67° 4'43.08"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03° C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.08
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	58
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>366</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>118</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	89
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	391.76
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.49
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	10
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.34
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	127
14	Sulfide	S <sup>-2</sup> mg/L)	Lovlbond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.71
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.012
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.20
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND
21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.13



22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.11
23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.05
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.12
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

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**Waste Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/WW/1570/-08	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Waste Water	<b>Quantity Of Sample</b>	24 Liters
<b>Sample Provided By</b>	HSE Services	<b>Sampling Methodology</b>	Composite
<b>Date of Sample Received</b>	Monday, August 1, 2022	<b>Analysis Type</b>	Chemical / Biological
<b>Sampling Time</b>	24 Hours (1 Hr 1 Liter)	<b>Site Location</b>	Gulberg
<b>Sampling Point</b>	Manhole	<b>Co-ordinates</b>	24°55'59.85"N 67° 4'6.00"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Address</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	Temperature	°C	By Calibrated Thermometer	40 + ≤ 03° C	30
2	pH @ 25 °C	pH	ASTM D-1293	6 to 9	7.44
3	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	3500	1306
4	Chemical Oxygen Demand	COD (mg/L)	ASTM D-1252	150	<b>631</b>
5	Biological Oxygen Demand	BOD <sub>5</sub> (mg/L)	APHA 5210	80	<b>203</b>
6	Total Suspended Solids	TSS (mg/L)	APHA 2540-D	200	93
7	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	1000	297.52
8	Fluoride	F <sup>-</sup> (mg/L)	Lovibond 170	10	1.46
9	Oil & Grease	O.Gr(mg/L)	ASTM D-4281	10	<b>13</b>
10	Phenolic compound	Phol (mg/L)	Lovibond 315	0.1	BDL
11	Cyanide	CN <sup>-</sup> (mg/L)	Lovibond-156	1.0	ND
12	Anionic Detergent	Det (mg/L)	ASTM D-6173	20	0.39
13	Sulfate	SO <sub>4</sub> <sup>-2</sup> (mg/L)	Lovibond-360	600	158
14	Sulfide	S <sup>-2</sup> mg/L)	Lovlbond 365	1.0	<0.04
15	Ammonia	NH <sub>3</sub> (mg/L)	Lovibond-60	40	0.36
16	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.1	ND
17	Chromium	Cr (mg/L)	Lovibond-124	1.0	0.017
18	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	1.0	0.33
19	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	0.5	<0.1
20	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	1.0	ND
21	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	5.0	0.24
22	Total Iron	Fe <sup>2+</sup> (mg/L)	Lovibond-222	8.0	0.13



23	Manganese	Mn. <sup>2</sup> (mg/L)	Lovibond-242	1.5	0.06
24	Selenium	Se. <sup>2</sup> (mg/L)	APHA 4500 Se	0.5	BDL
25	Silver	Ag (mg/L)	ASTM-D3866	1.0	ND
26	Arsenic	As (mg/L)	Palintest Kit	1.0	<0.01
27	Barium	Ba (mg/L)	ASTM D-4382	1.5	0.10
28	Boron	B(mg/L)	Lovibond-85	6.0	<0.1

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## Ground Water Testing Reports

### Ground Water Analysis Test Report

<b>Report No.</b>	HSE/ENV/22/JULY/GW/15 70/-01	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Monday, July 25, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Tuesday, July 26, 2022	<b>Sampling Location</b>	Jama Masjid Qadria, Liaquatabad
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°53'53.18"N 67° 2'41.40"E
<b>Client Name</b>	<b>M/s NESPAK Pvt. Ltd</b>		
<b>Client Address</b>	<b>Nespak House: 1-C, Block N, Model Town Extension, Lahore</b>		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.01
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO <sub>3</sub>	T.Hard (mg/L)	ASTM D-1126	<500	257.09
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	674
6	Aluminium	Al <sup>3+</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2+</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	<b>285.94</b>
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.51
16	Lead	Pb. <sup>2+</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2+</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2+</sup> (mg/L)	Lovibond-255	<0.02	BDL



20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL
22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	<0.1
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	ND
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.04
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

**Comments/Remarks:**

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/1570/-02	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Tuesday, July 26, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Wednesday, July 27, 2022	<b>Sampling Location</b>	Jama Masjid Nayab, Liaquatabad
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°54'4.04"N 67° 2'40.39"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Address</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.24
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO <sub>3</sub>	T.Hard (mg/L)	ASTM D-1126	<500	269.38
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	689
6	Aluminium	Al <sup>3+</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	<b>278.68</b>
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.49
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.05
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/1570/03	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Wednesday, July 27, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Thursday, July 28, 2022	<b>Sampling Location</b>	Balouch Masjid,
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°54'27.78"N 67° 3'42.09"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.63
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO3	T.Hard (mg/L)	ASTM D-1126	<500	317.58
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	746
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	<b>305.97</b>
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.71
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.06
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/157 0/-04	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Thursday, July 28, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Friday, July 29, 2022	<b>Sampling Location</b>	Rizwan Masjid, Liaquatabad
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°54'29.95"N 67° 3'12.91"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extention, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.74
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO3	T.Hard (mg/L)	ASTM D-1126	<500	249.61
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	681
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	273.86
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.56
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.05
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/1570/-05	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Friday, July 29, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Saturday, July 30, 2022	<b>Sampling Location</b>	Bait ul Mkkaram Masjid, Safari Park
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°54'23.59"N 67° 4'57.57"E
<b>Client Name</b>	<b>M/s NESPAK Pvt. Ltd</b>		
<b>Client Adress</b>	<b>Nespak House: 1-C, Block N, Model Town Extension, Lahore</b>		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.24
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO3	T.Hard (mg/L)	ASTM D-1126	<500	236.86
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	617
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	229.56
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.47
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.04
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100ml)	APHA9222-D	0/100ml	ND

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/157 0/-06	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Saturday, July 30, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Monday, August 1, 2022	<b>Sampling Location</b>	Roshan Masjid, Stadium Road
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°55'9.25"N 67° 5'59.70"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.51
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO3	T.Hard (mg/L)	ASTM D-1126	<500	349.70
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	793
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	<b>394.73</b>
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.61
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectiona ble/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectiona ble/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.06
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

**Comments/Remarks:**

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/15 70/-07	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Monday, August 1, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Tuesday, August 2, 2022	<b>Sampling Location</b>	Jamia Masjid, Agha Khan Hospital
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°56'9.56"N 67° 3'56.31"E
<b>Client Name</b>	<b>M/s NESPAK Pvt. Ltd</b>		
<b>Client Address</b>	<b>Nespak House: 1-C, Block N, Model Town Extension, Lahore</b>		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.38
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO <sub>3</sub>	T.Hard (mg/L)	ASTM D-1126	<500	236.05
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	597
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	227.68
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.43
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL



22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL
23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.06
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

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**Ground Water Analysis Test Report**

<b>Report No.</b>	HSE/ENV/22/JULY/GW/15 70/-08	<b>Reporting Date</b>	Monday, August 15, 2022
<b>Sample Nature</b>	Ground Water	<b>Quantity Of Sample</b>	1 Liter
<b>Sample Collected By</b>	HSE Services	<b>Sampling Methodology</b>	Grab
<b>Date of Sample Collection</b>	Tuesday, August 2, 2022	<b>Analysis Type</b>	Chemical / Microbiology
<b>Date of Sample Received</b>	Wednesday, August 3, 2022	<b>Sampling Location</b>	Jamia Masjid, Paradise School
<b>Sampling Point</b>	Tap	<b>Co-ordinates</b>	24°55'43.06"N 67° 4'30.44"E
<b>Client Name</b>	M/s NESPAK Pvt. Ltd		
<b>Client Adress</b>	Nespak House: 1-C, Block N, Model Town Extension, Lahore		

S.No	Measuring Parameter	Units	Testing Method	SEQS Limits	Test Results
1	pH @ 25 °C	pH	ASTM D-1293	6.5-8.5	7.67
2	Colour	TCU	APHA Pt-Co Scale	<15TCU	<5
3	Turbidity	NTU	Lovibond-385	<5	<5
4	Total Hardness as CaCO <sub>3</sub>	T.Hard (mg/L)	ASTM D-1126	<500	334.59
5	Total Dissolved Solids	TDS (mg/L)	APHA 2540-C	<1000	796
6	Aluminium	Al <sup>+3</sup> (mg/L)	Lovibond-40	0.2	ND
7	Antimony	Sb (mg/L)	ASTM D-3697	<0.005	ND
8	Barium	Ba (mg/L)	ASTM D-4382	0.7	ND
9	Boron	B(mg/L)	Lovibond-85	0.3	<0.1
10	Cadmium	Cd. <sup>2</sup> (mg/L)	Lovibond-87	0.01	ND
11	Chloride	Cl <sup>1-</sup> (mg/L)	ASTM D-512	<250	<b>359.64</b>
12	Chromium	Cr (mg/L)	Lovibond-124	<0.05	ND
13	Copper	Cu <sup>2+</sup> (mg/L)	Lovibond-149	2.0	ND
14	Cyanide	CN (mg/L)	Lovibond-156	0.05	ND
15	Flouride	F <sup>-</sup> (mg/L)	Lovibond-170	1.5	0.50
16	Lead	Pb. <sup>2</sup> (mg/L)	Lovibond-232	<0.05	ND
17	Manganese	Mn <sup>2+</sup> (mg/L)	Lovibond-242	0.5	ND
18	Mercury	Hg. <sup>2</sup> (mg/L)	Kit Method	<0.001	ND
19	Nickel	Ni. <sup>2</sup> (mg/L)	Lovibond-255	<0.02	ND
20	Nitrate	NO <sub>3</sub> <sup>-</sup> (mg/L)	Lovibond-265	0.5	BDL
21	Nitrite	NO <sub>2</sub> <sup>-</sup> (mg/L)	Lovibond-270	3	BDL
22	Selenium	Se. <sup>2</sup> (mg/L)	APHA 3500 Se	0.01	BDL



23	Residual Chlorine	Cl <sub>2</sub> (mg/L)	Lovibond-100	0.2-0.5	<0.1
24	Taste	.....	Sensory Method	Non Objectionable/ Acceptable	ND
25	Odour	.....	Sensory Method	Non Objectionable/ Acceptable	ND
26	Arsenic	As (mg/L)	Palintest Method	0.05	ND
27	Zinc	Zn. <sup>2</sup> (mg/L)	Lovibond-400	<5	0.05
28	Pesticides	mg/L	HPLC	0.15	ND
29	Phenolic compound	Phol (mg/L)	Lovibond-315	0.002	BDL
30	Total Coliform	TC(count/100ml)	APHA9222-B	0/100ml	ND
31	Feacal Coliform	F.Coli(count/100 ml)	APHA 9222-G	0/100ml	ND
32	Escherichia Coli	E.Coli(count/100 ml)	APHA9222-D	0/100ml	ND

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**\*out of limit values are shown in bold numbers**



### 4. Photolog





**Analyzed By:**  
*(Field Analyst)*

**Prepared By:**  
*(Assistant Analyst)*

**Verified By:**  
(Chemist)

HSE Services

**Date of Issue:** August 20, 2022



**Annex-IV**  
**Survey Tools**

**NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED**

**KARACHI WATER & SEWERAGE SERVICES IMPROVEMENT PROJECT**

**(KWSSIP)**

**Socioeconomic Survey**

1. Name of Interviewer \_\_\_\_\_ Date \_\_\_\_\_  
2. Location / Home Town \_\_\_\_\_ Tehsil & District \_\_\_\_\_

**A- Demographic Characteristics.**

3. Name of the Respondent \_\_\_\_\_

4. Gender

1. Male                      2. Female

5. Age                      15-25 \_\_\_\_\_                      25-35 \_\_\_\_\_

35-45 \_\_\_\_\_                      45 & above \_\_\_\_\_

6. What is your education level?

I. Illiterate \_\_\_\_\_                      II. Primary \_\_\_\_\_                      III. Middle \_\_\_\_\_

IV. Metric \_\_\_\_\_                      V. Intermediate \_\_\_\_\_                      VI. Above Inter \_\_\_\_\_

7. Profession \_\_\_\_\_

8. Marital Status

1. Married \_\_\_\_\_                      2. Un-married \_\_\_\_\_

9. Language Spoken \_\_\_\_\_

10. Caste / Ethnic Group \_\_\_\_\_

11. Religion \_\_\_\_\_

12. What Type of your family system?

1. Joint \_\_\_\_\_                      2. Nuclear \_\_\_\_\_

13. Total number of family members living with you.

Male \_\_\_\_\_ Female \_\_\_\_\_ Total \_\_\_\_\_

14. What are your normal working hours? \_\_\_\_\_

**B- Socio-Economic Characteristics.**

15. What are the major sources of your household income?

1. Govt, job \_\_\_\_\_                      2. Private job/Labour \_\_\_\_\_                      3. Business \_\_\_\_\_

4. Student \_\_\_\_\_                      5. Any other \_\_\_\_\_

16. What is distance of your office/factory from your house?

1K.m-10K.m \_\_\_\_\_                      10K.m-20K.m \_\_\_\_\_

20K.m-30K.m \_\_\_\_\_                      30K.m& Above \_\_\_\_\_

17. What is your average monthly income?

1. Less than 10000 \_\_\_\_\_
2. +10,000 – 20,000 \_\_\_\_\_
3. +20,000 -30,000 \_\_\_\_\_
4. +30,000 -40, 000 \_\_\_\_\_
5. Above 40,000 \_\_\_\_\_

18. How much is your average monthly expenditure? (Rs).

1. Less than 10,000 \_\_\_\_\_
1. +10,000 – 20,000 \_\_\_\_\_
2. +20,000 -30,000 \_\_\_\_\_
3. +30,000 -40,000 \_\_\_\_\_
4. Above 40, 000 \_\_\_\_\_

19. Status of ownership (In case of shop keeper/business owner/ resident)?

1. Owner
2. Renter

20. What type of construction of your house (In case of resident)?

1. Pacca \_\_\_\_\_
2. Semi Pacca \_\_\_\_\_
3. Katcha \_\_\_\_\_

21. Since how long are you living in this area?

Period \_\_\_\_\_

**C- Civic Amenities.**

22. Which of the following facilities available in your area?

1. Electricity\_\_\_\_\_
2. Water supply\_\_\_\_\_
3. Gas \_\_\_\_\_
4. Sewerage line\_\_\_\_\_

23. What are the sources of household water being used in the project area?

1. Govt supply \_\_\_\_\_
2. Bore hole\_\_\_\_\_
3. Hand pumps \_\_\_\_\_
4. Any other \_\_\_\_\_

24. Are you satisfied with the water quality?

1. Yes \_\_\_\_\_
2. No \_\_\_\_\_

If no, then what are the reasons of dissatisfaction?

1. Odour water \_\_\_\_\_
2. Polluted water\_\_\_\_\_
3. Salinity in water\_\_\_\_\_
4. No response\_\_\_\_\_

25. Is your house connected with sewerage system?

1. Yes
2. No

26. Are you satisfied with current sewerage drain in this area?

1. Yes
2. No

If no, then reasons

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

27. What is the source of energy for cooking and lightening in this area?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

28. What is your land holding \_\_\_\_\_ in acres?

29. What is the source of water used for irrigation purpose?

1. Tube well \_\_\_\_\_ 2. Canal \_\_\_\_\_ 3. Any Other \_\_\_\_\_

30. What are major crops in this area?

i----- ii ----- iii ----- iv-----

**D-Social Institutions (Education & Health).**

31. Is there any educational institute in this area?

1. Yes 2. No

If yes, then

Name \_\_\_\_\_ Distance \_\_\_\_\_

32. Is there any health facility availability in this area?

1. Yes 2. No

If yes, then

Name \_\_\_\_\_ Distance \_\_\_\_\_

33. What are the major common diseases (waterborne) in project area?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

34. What is the principle mode of transport being used by you (respondent) in this area?

1. Public \_\_\_\_\_ 2. Private \_\_\_\_\_ 3. Both \_\_\_\_\_

**E- Cultural Characteristics.**

35. Is there any shrine/mosque in this area?

1. Yes 2. No

If yes, then

Name \_\_\_\_\_ Place \_\_\_\_\_

36. Are there any Protected/ archaeological/historical site in this area?

1. Yes 2. No

If yes, then

Name \_\_\_\_\_ Place \_\_\_\_\_

Significance \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

37. Specify the existing Non -Government Organizations (NGOs) in your area and state of their area of work?

Name of Organization \_\_\_\_\_ Area of interest \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

35. Do you know about KWSSIP?

1. Yes      2. No

(If no then tell him about the proposed Project)

**F- Assessment of Environmental & social impacts.**

36. In your opinion should this project be implemented here?

1. Yes      2. No

If yes, then reasons	if no, then reasons
_____	_____
_____	_____
_____	_____

37. In your opinion, what would be the possible impacts of this project?

During construction \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

During operation \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

38. What protective measures do you suggest during construction to safeguard your interests?

Protective measures \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

39. In your opinion, what are some of the pressing needs of this area (other than proposed project)?

Pressing Needs \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**G- Indigenous People.**

40. Any Indigenous community living in the Project Area?

1. Yes                      2. No

41. Anticipated Impact on Indigenous community

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42. Status of Indigenous People?

1. Registered                      2 not registered

43. Income sources? \_\_\_\_\_

44. Any other observations by Interviewer during site visit?

---

Signature of Interviewer: \_\_\_\_\_







<b>Sr.#</b>	<b>Name</b>	<b>Occupation</b>	<b>Signature</b>
6			
7			
8			
9			
10			
11			
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18			
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21			
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23			
24			
25			

<b>Sr.#</b>	<b>Name</b>	<b>Occupation</b>	<b>Signature</b>
26			
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44			

**KARACHI WATER & SEWERAGE SERVICES IMPROVEMENT PROJECT  
(KWSSIP)**

**Gender Situation Survey**

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A. Name of Interviewer: \_\_\_\_\_

Date: \_\_\_\_\_

B. Site Location:

Sub-village \_\_\_\_\_

Village/Town \_\_\_\_\_

Union Council \_\_\_\_\_

Tehsil & District \_\_\_\_\_

Permanent Address:

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---

1. What is your age? \_\_\_\_\_ Years

2. What is your education? \_\_\_\_\_

3. Are you married \_\_\_\_\_

4. If married what was your age at the time of marriage? \_\_\_\_\_ Years

5. How many children do you have?

I. Male \_\_\_\_\_ II. Female \_\_\_\_\_ III. Total \_\_\_\_\_

6. What is your occupation?

I. House Wife \_\_\_\_\_ II. Working Woman \_\_\_\_\_

7. In case of house wife, what are the reasons for not working?

---

---

8. In case of working women what is your nature of work?

I. Office work \_\_\_ II. Agriculture \_\_\_ III. Making Mud Pots \_\_\_ IV. If any Others (Please Specify) \_\_\_\_\_

9. Do women of the area work in local markets and streets? If yes? What kind of work?

Yes \_\_\_\_\_ No \_\_\_\_\_

10. Where do you work?

I. In your house \_\_\_\_\_ II. Outside of your house \_\_\_\_\_

III. If you work outside then distance \_\_\_\_\_ Km

IV. Mode of transport \_\_\_\_\_ V. Time spent \_\_\_\_\_ Hrs

11. Do you feel Sexual Harassment at your workplace? \_\_\_\_\_

12. How many hours per day do you work? \_\_\_\_\_ Hours

13. How much salary do you receive per month? Rs. \_\_\_\_\_

14. Do you have full power to spend your money the way you like?  
 I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

15. Do you also work in the agriculture fields/ homes?  
 I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

16. If yes, how many hours per day? \_\_\_\_\_ Hours  
 I. Part Time \_\_\_\_\_ II. Full Time \_\_\_\_\_

17. Do you save some money from your household income every month?  
 I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

**A. Decision Making**

18. Do you play role in making decision in your house regarding agriculture/business affairs?  
 I. Yes \_\_\_\_\_ II. No. \_\_\_\_\_

If yes, type of decisions \_\_\_\_\_

If No, why \_\_\_\_\_

19. Do you play role in making decision in your house regarding domestic affairs?  
 I. Yes \_\_\_\_\_ II. No. \_\_\_\_\_

If yes, type of decisions \_\_\_\_\_

If No, why \_\_\_\_\_

**B. Household Tasks**

Activities	Daily Activity	Seldom
Sewing		
Washing		
Cleaning Pots / Dishes		
Cleaning the House		
Cooking		
Grocery for Houses		
Take Care of the Children		
Do some skilled work at home and sell it in market		
Any Other (please specify)		

**C. Time Distribution**

- Time spent on working place (in case of working women) \_\_\_\_\_ Hrs
- Time spent on household tasks \_\_\_\_\_ Hrs
- Time spent on livestock care \_\_\_\_\_ Hrs
- Time spent on agricultural activities \_\_\_\_\_ Hrs
- Total working hours / day \_\_\_\_\_ Hrs

20. Is this area safe enough to travel alone for women?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

If no why? \_\_\_\_\_

21. In your opinion what protective measures should be taken to avoid these situations?

\_\_\_\_\_

**D. Health Information**

22. Do you have any health problem?

I. Yes \_\_\_\_\_ II. No. \_\_\_\_\_

If yes, Detail please \_\_\_\_\_

23. Do you or your family member got following water borne disease last year?

Sr. No.	Disease	Response	If Yes then Treatment Exp (PKR)
1	Cholera	1. Yes 2. No	
2	Diarrhea	1. Yes 2. No	
3	Typhoid	1. Yes 2. No	
4	Urological	1. Yes 2. No	
5	Hepatitis	1. Yes 2. No	
6	Gastroenteritis	1. Yes 2. No	
7	Any other	1. Yes 2. No	

24. How often you or your family member fall ill with these diseases?

a. Most of time      b. Rarely      c. Other (specify) \_\_\_\_\_

If yes, whom do you consult for treatment?

1. Doctor \_\_\_\_ 2. Hakeem \_\_\_\_ 3. Traditional Healer \_\_\_\_

25. Are you satisfied with the present health facilities in your area?

Government:

I. Yes \_\_\_\_\_ II. No. \_\_\_\_\_

If No, why \_\_\_\_\_

Private:

I. Yes \_\_\_\_\_ II. No. \_\_\_\_\_

If No, why \_\_\_\_\_

26. Place of treatment \_\_\_\_\_ Distance \_\_\_\_\_ Mode of Transport \_\_\_\_\_

Average monthly household expenditure on health (PKR)? \_\_\_\_\_

**E. Water Supply System**

27. Who deals with water supply and sanitation issues at household level?

\_\_\_\_\_

28. What is the source of drinking water?

1. Public Water Supply \_\_\_\_\_ 2. Hand Pumps \_\_\_\_\_ 3. Electric Motor \_\_\_\_\_  
4. River Water \_\_\_\_\_ 5. Small Dam \_\_\_\_\_ 6. If any other (please specify) \_\_\_\_\_

29. How often water is available at your house?

1. Always 2. Once a day 3. Once a week 4. Other \_\_\_\_\_

30. What is taste of your water?

1. Sweet 2. Brackish 3. Other (Specify) \_\_\_\_\_

31. What is color of your water?

1. Clear 2. Cloudy 3. Other (Specify) \_\_\_\_\_

32. Are you satisfied with quality of water available? 1. Yes 2. No

33. How much you use water daily (liters/gallons)? \_\_\_\_\_

34. What kind of challenges do women of the area face due to limited access of water?

\_\_\_\_\_

35. What type of information do women of the area have about water born diseases?

\_\_\_\_\_

#### **F. Sewerage System**

36. Is sewerage system available? 1. Yes 2. No

37. What type of sewerage available?

1. Piped sewer system 2. Open drains 3. Others \_\_\_\_\_

38. How is sewerage system connected?

1. Main nearby sewer 2. Open Drains 3. Others \_\_\_\_\_

39. What type of sanitation facility available at your house?

1. Toilet 2. Dry pit latrines 3. Composting toilets  
4. Buckets 5. Container based 6. No facility/bush/field 7. Other \_\_\_\_\_

40. Location of sanitation facility?

1. In own dwelling 2. In own yard/ plot 3. Elsewhere

41. Type of disposal facility?

1. Removed by service provider 2. Emptied by household

42. What is the knowledge level of adolescent girls on menstrual hygiene? What type of sanitary material do they use during menstruation cycle?

\_\_\_\_\_

43. Do women have access to KW&SB offices/ Customer Service Center? \_\_\_\_\_

44. If Government establishes Karachi Water & Sewerage Board offices in the area. Would you like to visit there for complaints and for bill verification?

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45. What type of office would KW&SB establish where you can easily access? In terms of distance, environment, staff and facilities?

---

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46. Do you want to learn some skills for earning your livelihoods?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

47. If yes, what type of skills? \_\_\_\_\_

48. Should women get education?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

49. Health Facility available in the area?

Private Clinics \_\_\_\_\_

BHU \_\_\_\_\_

Mother-Child Care Facility \_\_\_\_\_

Others \_\_\_\_\_

50. Are you satisfied with this facility? Yes \_\_\_\_\_ No \_\_\_\_\_

If No Why? \_\_\_\_\_

51. Do women of the area face gender-based violence or domestic violence?

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52. Are the women allowed to go outside their houses freely or have limited access?

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53. How many houses are headed by women in the community?

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54. What are the cultural practices in the community like early marriages restricted mobility etc.?

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55. Are there any sexual harassment incidents reported in the area or not?

1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

56. What is the gender labor division in a household in the community?

---

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57. What are the pressing needs of the women of the area?

\_\_\_\_\_

\_\_\_\_\_

58. Is there any association/organization of females in this area?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

If yes, then what is its name and area of work

\_\_\_\_\_

\_\_\_\_\_

59. Do you know about the proposed Project?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

60. In your opinion, should this Project be implemented here?

I. Yes \_\_\_\_\_ II. No \_\_\_\_\_

61. Do you feel this project in your area help you to rise your standard of living?

1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

62. How much amount you think is appropriate for water and sanitation bill? \_\_\_\_\_

63. Would you like to volunteer yourself to collect tariff in case of formation of any committee or CBO?

1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

64. Did you avail generally better health facilities, water and sewerage facilities in your area due to this project?

If Yes, how \_\_\_\_\_

If No, why \_\_\_\_\_

**G. Possible impacts/effects of the Project**

- a. Employment opportunities
- b. Living standard
- c. Unemployment
- d. Income generating activities
- e. Development of Area
- f. Mobility (Access to Resources)
- g. Resolve Issues regarding Water and Sewerage System
- i. Other specify \_\_\_\_\_

65. What are your suggestions regarding proposed project?

\_\_\_\_\_

\_\_\_\_\_

Name & Signature of Interviewer: \_\_\_\_\_



**Annex-V**  
**Photolog**

**PICTORIAL VIEW OF HEALTH INSTITUTES FALLING IN THE PROPOSED PROJECT AREA**



Dispensary of Zacha Bacha, P-01 (Teen Hatti)



Homeo Cure (Homeopathic Clinic), P-01 (Teen Hatti)

**PICTORIAL VIEW OF EDUCATIONAL INSTITUTES FALLING IN THE PROPOSED PROJECT AREA**



Govt. Grammar Boys Secondary School – Liaqatabad, P-01 (Teen Hatti)



APWA Govt. Girls Higher Secondary School, P-01 (Teen Hatti)



Ayesha Coaching Academy, P-01 (Teen Hatti)



Q.M. English School (Boys & Girls), P-01 (Teen Hatti)

**PICTORIAL VIEW OF MOSQUES FALLING IN PROJECT AREA**



Jamia Masjid Qadriya, P-01 (Teen Hatti)



Jamia Masjid Zubaida Atariya, P-01 (Teen Hatti)



ALLAH Wali Masjid, P-01 (Teen Hatti)

**Annex-VI**  
**Photolog of Public Consultations**

Photo Log of Public Consultation Meeting at P-01 (Teen Hatti)





**Consultation meetings at P-01 (Teen Hatti)**

**Annex- VII**  
**Photolog of Gender Consultations**

**Gender Consultation meeting at P-01 (Teen Hatti)**





**Annex-VIII**  
**Photolog of Institutional Consultations**

## Consultation with relative Government Departments



**Meeting with GIS Section of Anti-Encroachment Cell (Commissioner's Office)**



**Meeting with Additional Commissioner – II**



**Meeting with Mr. Junaid Khan Director General Parks and Horticulture**



**Meeting with Prem Kumar (PD) Local Govt. Housing & Town Planning Department**



**Meeting with Mr. Rana Dildar of Marine and Fisheries Department**



**Meeting with Mr. Imran Sabir of SEPA**



**Meeting with Mr. Javed Ahmad Mahar  
Director Wildlife of Sindh Forest & Wild Life  
Department**



**Meeting with Mr. Zahid Farooq of Urban  
Resource Center**



**Meeting with Directorate General of  
Antiquities, Government of Sindh**



**Meeting with Mr. Sarmad Shah of K- Electric**



**Meeting with Karachi Institute of Health Sciences, Gulberg  
Plate 5.1: Meeting with relevant Government department**

**Annex- IX**  
**Minutes of Meeting**



**Karachi Water & Sewerage Services Improvement Project  
Project Implementation Unit (PIU)**

**Karachi Water & Sewerage Board (KW&SB)**

Room No. 10, Block-C, KW&SB Office, 9<sup>th</sup> Mile Karsaz,  
Shahra-e-Faisal, Karachi, Tel No. +92-21-99245134



**MINUTES OF MEETING OF KARACHI WATER & SEWERAGE SERVICES IMPROVEMENT  
PROJECT (KWSSIP) AND SINDH ENVIRONMENTAL PROTECTION AGENCY (SEPA) HELD ON  
APRIL 3<sup>RD</sup>, 2023**

A meeting to seek guidance of SEPA on submission of requisite environmental document was conducted on April 3<sup>rd</sup>, 2023 at 1200 hrs. in the office of Deputy Director (Technical), Mr. Imran Sabir at Sind Environmental Protection Agency office, Sector 23, Korangi Industrial Area, Karachi.

The meeting was attended by Ms. Kiran Bano (Environmental Specialist PIU-KWSSIP), Mr. Aftab (Sr. Engineer, NESPAK), Mr. Fahim Memon (Environmental Specialist, NESPAK) and Mr. Imran Sabir (Deputy Director Technical SEPA).

NESPAK, being the consultant, delivered a presentation to describe the following three sub projects of Series of Project (SOP) 1 of KWSSIP;

1. Package KA-1 Rehabilitating Water Supply and Sewerage in Soba Nagar and Goharabad
2. Construction of Center of Reform, Research and Innovation (CERRI) Building
3. Priority Water Network Rehabilitation (Supply & Install Water Meters to Bulk Customers)

The Environmental Specialist of Project Implementation Unit (PIU) KWSSIP briefed the details about the sub projects. The Deputy Director, SEPA shared his views on the environmental documents required for each sub project;

- For "Rehabilitating Water Supply and Sewerage in Soba Nagar and Goharabad," an Initial Environmental Examination Report (IEE) will be required to be submitted.
- "Construction of Center of Reform, Research and Innovation (CERRI) Building" does not require any document to be submitted as the area of the building is less than 60,000 square feet.
- For "Priority Water Network Rehabilitation (Supply & Install Water Meters to Bulk Customers)," no document is required to be submitted due to lesser impacts.
- It was informed that the concerned district offices shall be informed about the proposed project activities by SEPA via a circular during execution of the project.

As the powers have been devolved to the district levels, therefore, the concerned district offices shall be informed about the proposed project activities by SEPA via a circular to inform them about project activities during execution of the project.

The meeting ended with a note of thanks.

Received  
18/04/2023  
Muhammad Imran Sabir  
Deputy Director (Technical)  
Sindh Environmental Protection Agency  
Government of Sindh

(KIRAN BANO)  
Environmental Specialist  
PIU, KWSSIP

**Annex-X**  
**Sanitation Plan**

# **Sanitation Plan**

## **1. Introduction**

This plan outlines the measures that can improve conditions of sanitation at construction sites during construction and operation phase.

## **2. Purpose of the plan**

The plan intends to ensure sanitation including the control of water supplies, excrete and wastewater disposal, refuse disposal, vectors of diseases, housing conditions, food supplies and handling, atmospheric conditions, and the safety of the working environment.

## **3. Management of Sanitation During Construction Phase:**

### **i) Responsibility:**

The Health and safety Inspector designated by construction contractor shall inspect sanitation conditions and ensure safe working environment for workers.

### **ii) Location of Camp Sites**

The construction camps shall be located at least 500 m away from residential community. The accommodation and ancillary facilities for labour shall be constructed and maintained to standards and scales approved by the Resident Engineer.

The camps must be located such that the drainage from and through the camps shall not endanger any domestic or public water supply.

All sites must be managed to avoid ditches/depressions to minimize nuisance due to stagnant water.

### **iii) Water Supply**

An adequate and convenient water supply, approved by the appropriate health authority, must be provided in each camp for drinking, cooking, bathing and laundry purposes.

Potable water supply systems for labour camps occupants shall meet the drinking water quality standards of Pakistan. In addition, the design of water system facilities shall be based on the suppliers Engineer's estimates of water demands. The drinking water must be monitored regularly for drinking water quality parameters.

At all construction camps and other workplaces, good and sufficient water supply shall be maintained to eliminate chances of waterborne/water-related/water-based diseases to ensure the health and hygiene of the workers.

#### iv) Toilet Facilities and Hygiene

According to health and safety guidelines OR-OSHA number of toilets required at construction site is as 1 toilet for 20 workers. **Table 1** shows the number of toilets required in accordance with the number of employees at construction site. The total numbers of employees at construction site are estimated to be 50 persons.

**Table-1: No. of Toilets Required for Employees at Construction Site:**

No. of Employees	No. of Toilets and Urinals by OSHA	Total No. Toilets and Urinals Required at Construction Site
Up to 20	1 toilet	3 toilets
Up to 40 employees	1 urinal	2 urinals

Within the premises of every workplace, toilets and urinals shall be provided in an accessible place. A toilet must be located within 200 feet of the camp. No toilet may be closer than 100 feet to kitchen and sleeping area. These toilets must be distinctly marked by signs printed in native language of the persons occupying the camp, or marked with easily understood pictures or symbols.

Proper facility for hand washing and other cleaning activities to be provided, e.g;

- Providing hand soap and industrial hand cleaner for removing paints and other contaminants;
- Prohibited use of gasoline or solvent for hand washing; and
- Keep the floor of facilities dry to prevent spills and falls.

#### v) Waste Disposal

The sewage system for the camp must be designed, built and operated in compliance with the relevant legislation so that no health hazard occurs and no pollution to the air, ground or adjacent watercourse takes place.



Garbage bins must be provided in the camps and regularly emptied and garbage disposed of in a hygienic manner. Unless otherwise arranged for by the local sanitary authority, arrangement for disposal of excreta should be done in the already existing sewerage system in the area.

On completion of the works, all such temporary structures shall be cleared away, all rubbish burnt, excreta tank and other disposal pits or trenches filled in and effectively sealed off and the outline site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the engineer.

**vi) Maintenance of Sanitary Facility**

Proper maintenance of toilets and other sanitary facilities should be assured at construction camp site by the construction contractor. Toilets and other sanitary facilities shall be cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition.

All buildings, rooms and equipment and the grounds surrounding them shall be maintained in a clean and operable condition and be protected from rubbish accumulation. All necessary means shall be employed to eliminate and control any infestations of insects and rodents within all parts of any labor camp.

**vii) Site Clearance:**

The construction contractor shall assure the clearance of construction machinery, vehicle and other equipment used during the construction period after the completion of the project.

**viii) Storm Water/Sewage Clearance:**

One of the main issue that may arise during construction and operational phase is the clogging of drainage/sewer pipelines as a result of construction material, oil spillage from vehicles, throwing of solid waste by the road users due to lack of bins into the nearby drainage/sewer pipes, etc. the blockage of these drainage pipes will cause over flow of water on road, which will have negative impacts on the road in form of deterioration of road surface as well as standing water acts as a source of water-through disease in the area.

**Responsible Authorities:**

In case of storm water drains/sewer pipes clogging the concerned department is responsible for un-clogging of these sewer and drainage pipelines.

**ix) Awareness and Training:**

A training and awareness sessions shall be conducted by the construction contractor for workers before commencement of the project. The implementation of sanitation plan would be more effective if the importance of hygiene; sanitation and safety are known to the workers.

**Annex-XI**  
**Chance Find Procedure**

## **CHANCE FIND PROCEDURES**

Project may involve deep excavation. Therefore, the possibility of chance find is not ignorable. In case of any chance find, the contractor will immediately report through Supervision Consultant to Directorate General (DG) of Antiquities & Archaeology, Government of Sindh to take further suitable action to preserve those antique or sensitive remains. Representative of the "Director Archaeology and Museum (DAM)" will visit the site and observed the significance of the antique, artifact and Cultural (religious) properties and significance of the project. The documentation will be completed and if required suitable action will be taken to preserve those antiques and sensitive remains.

In case any artifact, antiques and sensitive remains are discovered, chance find procedures should be adopted by contractor workers as follows:

- Stop the construction activities in the areas of chance find;
- Delineate the discovered site or area;
- Consult with the local community and provincial Archeological Department
- The suggestion of the local communities and the concerned authorities will be suitably incorporated during taking the preventive measures to conserve the antique, artifact and cultural (religious) properties
- Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remain, a night guard shall be arranged until the responsible local authorities take over;
- After stopping work, the contractor must immediately report the discovery to the Supervision Engineer.

The contact Address of Directorate General of Antiquities & Archaeology is given below:

Antiquities House. C/82, Block-2,  
Near Bilal Masjid, Clifton, Karachi,  
Sindh 75600

Tel: 021-99212126  
021-99212127

**Annex-XII**  
**Resource Conservation Plan**

## Resource Conservation Plan

### 1. Introduction:

The resources in this world are not infinite. We are completely dependent on the resources of the earth to fulfill all our day-to-day requirements. Sustainable development calls for the need to conserve resources, especially the non-renewable resources.

### 2. Objective of the plan:

The Resource Conservation Plan is intended to make an effort towards achieving sustainable development. The objective of the resource conservation plan is to:

- Minimize the use of natural resources; and
- Mitigate/ prevent pollution contaminating the natural resources.

### 3. Planning:

Careful estimations of quantities of material, fuel, water and energy required directly or indirectly shall be done to avoid excessive or unnecessary wastage of these materials. In addition to this, pollution prevention strategies shall also be devised to prevent contamination of resources.

The estimations include the following:

1. Estimation of construction material required for the project
2. Estimation of fuel consumption for construction machinery, construction vehicles and generators etc.
3. Estimations of the energy requirements during all the stages of the project
4. Estimations of water consumption for construction activities and construction camp sites.

The pollution prevention strategies include the following

1. Strategies shall be planned to reduce loads on the identified resources to be consumed;
2. Best management practices shall be devised to control or reduce pollution resulting from the activities during different stages of the project; and
3. An inspector shall be assigned responsibility to oversee the ongoing activities to check the compliance of the planned strategies.

### 4. Execution of the plan:

The planned strategies shall be implemented to conserve the natural resources including but not limited to the following:

## **Material**

- Material supplied shall be in conformance with the estimated quantities and excess material shall be returned to the supplier;
- Material wastage shall be avoided by using best management practices;
- Waste produced during the project execution shall be disposed of safely to the designated disposal sites through approved contractors; and
- Reuse of the materials shall be appreciated.

## **Fuel/Energy**

- Reduce trips and optimize routes to and from the construction site for all kinds of activities;
- Regular maintenance of equipment and vehicles to avoid leaks and sustain efficient fuel consumption;
- Switch off/plug off idle equipment and vehicles to avoid wastage of fuel;
- Minimize warm up time, unnecessary acceleration and deceleration of the construction equipment and vehicles;
- Avoid unnecessary burning of fuel for cooking in construction camps;
- Avoid unnecessary heating/cooling systems during extreme weathers;
- Construction shall start in early hours of the day to avoid heat in summers and utilization of day light; and
- Alternate energy sources shall be considered for electricity generations during construction to conserve fossil fuel as it is nonrenewable resource.

## **Water**

- Avoid using potable water for sprinkling, curing and washing of equipment/ vehicles. Surface water or treated effluent can be used instead;
- Wastage of water should be controlled through providing proper valves and through controlling pressure of the water;
- Unnecessary equipment washings should be avoided;
- Awareness amongst workers shall be raised to conserve water and immediately report for any leaks detected; and

## **Pollution:**

- Emissions shall be reduced/controlled as far as possible and direct discharges to air shall be avoided by strictly adhering to the mitigation measures outlined in ESMP report;
- Waste water shall not be discharged directly into the water body and must be managed as per the recommendations presented in ESMP; and

- Construction & demolition waste and municipal solid waste shall not be dumped/ burnt openly and shall be handled according to the preventative measure given in ESMP study.

## **5. Checking and Corrective Actions**

The proponent shall bind the construction contractor through contract agreement to comply the strategies outlined in Resources Conservation Plan. The proponent shall also appoint an Inspector who shall monitor the daily onsite activities and shall report any issues/ concerns raised in relation to Resource Conservation Plan. The inspector shall recommend adequate corrective actions to mitigate the issues raised.



**Annex-XIII**  
**Health & Safety Management Plan**

## **1. Introduction**

This health and safety management plan has been prepared to identify and outline the manner in which construction site health and safety aspects will be managed to ensure the safe and efficient performance of the construction phase activities and to minimize adverse effects on the existing community and workers arising from construction activities.

This plan is designed to identify, evaluate, and control health and safety hazards for the purpose of protecting employees. The plan provides for emergency response activities at the job site as well as covering site hazard analysis, training requirements, engineering controls, materials handling, and safe construction operations. This plan is intended to provide guidance and information in dealing with the hazards that may be faced on the construction site by the contractor and its workers.

### **1.1 Overview**

PIU-KWSSIP has recognized the importance of maintaining a safe and the healthy work environment for all personnel and the stewardship required in maintaining an effective and successful program. This HSMP applies to all on-site personnel and describes the safety and environmental standards.

The consultant as a third-party validator will monitor the compliance of the plan by the contractor and its workers on each construction site.

The purpose of this plan is to illustrate safety issues specific to the KWSSIP. This plan is intended to maintain a safe work environment and effectively reduce the number of accidents resulting in personal injury, property damage, and damage to construction equipment.

### **1.2 Change Authority**

This HSMP is the document of PIU-KWSSIP and the construction contractor will be legally bound for its implementation. The contractor may amend the HSMP according to site-specific conditions with the approval of PIU and Supervision Consultants (SC). However, during the operation phase, KW&SB shall be responsible for the compliance of this HSMP and may make changes, as required.

## **2. Project Description**

The project is focused to resolve water and sanitation issues in Karachi. A series of projects have been conceived under Karachi Water and Sewerage Services Improvement Project (KWSSIP). Currently, SOP-I is under implementation, which has further three components. Component 2 of SOP-I has further three Assignments as given below;

Sr. No.	Assignment	Project
1	Assignment - A	Rehabilitating water supply and /or sewerage in three low-income communities in Karachi
2	Assignment - B	Priority Water Network Rehabilitation including O&M Equipment, Meters & DMAs to Reduce NRW
3	Assignment - C	Priority Sewer Network Rehabilitation

This HSMP deals with Assignment C, which is 'Priority Sewer Network Rehabilitation'. The HSMP will provide an overall map of the systems and procedures to be implemented on-site. This document will list systems for managing consultation, communication, the identification of hazards, and the control of risks and hazards at the proposed construction site during the implementation stage. This Project HSMP can be amended as site conditions vary. Contractors, sub-contractors, and suppliers are responsible for the project health safety management at the construction site.

### 3. Objectives

The objectives of this HSMP are as follows:

- To prevent worker's injury
- To ensure all actions identified as being required to improve the health & safety of personnel are completed by the nominated implementation date.
- To prevent property damage.
- Promote the health, safety and well-being of all persons in the workplace
- To provide guidance on the safety systems, procedures, and, standards to be applied to the project works.
- To ensure compliance with health & safety standards, and legislation as well as both consultant and client project health and safety requirements.
- To provide a system to continually review and improve health & safety work practices in order to consistently achieve or exceed industry best standards.
- To promote the involvement of all employees in improving safety behavior.
- To achieve an incident & injury-free workplace.

In pursuit of these objectives and to provide targets against which OH&S performance can be measured and improved, detailed **Key Performance Indicators (KPI's)** have been developed for the project and are mentioned in Heading 13.2 under Project Health and safety performance.

### 4. Health and Safety Organization

Having the appropriate organizational structure and people appointed for Health and Safety are essential for the success of a project.

## 4.1 Team Structure

People who will be responsible for the management of the project's OHS/CHS risks and compliance to this Plan will be as follows:



## 4.2 Roles & Responsibilities

### A. Site In charge

- Approve/ modify devised measures to prevent or mitigate the risks associated with the identified risk sources;
- Arrange resources for dealing with potential emergencies including, financial, equipment, and personnel required to deal with emergencies;
- Assure that the ERP is adequate, effective, and implementable.

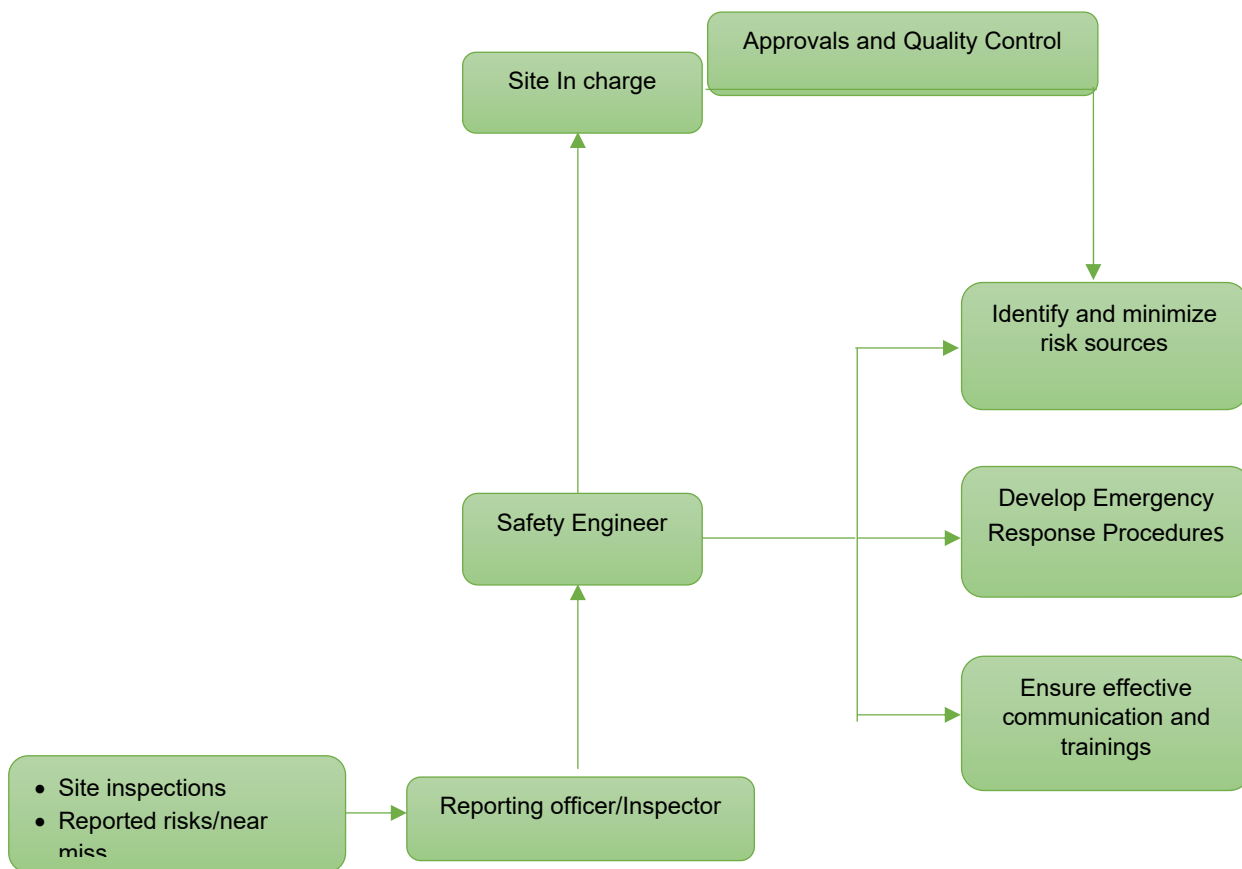
### B. Safety Engineer

- Analyze the Identified risk sources and devise measures to prevent or mitigate the risks in close consultation with the Team Leader;
- Develop and implement the Emergency Response Procedures, in case of the possible emergencies arise;
- Ensure effective internal and external communication; and
- Provide regular trainings and arrange drills to make people aware of dealing with emergencies.

### C. Reporting officer/Inspector

- Regular inspections of the site, to identify potential risks associated with equipment, materials and work practices;
- Anybody from the site can notify the reporting officer about potential risks and/ or near-misses on the site;
- Record any identified risks and mitigation measures to control the identified risk; and
- Notify the issue and control measures taken thereby to the safety engineer.

The designation, roles and responsibilities of each member shall be clearly defined and communicated to the employees. An outline of the framework of responsibilities is presented in the following organizational chart:



## 5. LEGAL AND OTHER REQUIREMENTS

Local laws as well as WB guidelines ensure both OHS/CHS for the proposed project.

### 5.1 Sindh OHS Act, 2017

Act to make provision for occupational safety and health conditions at all workplaces for the protection of persons at work against risk of injury arising out of the activities at work places and for the promotion of safe, healthy and decent working environment adapted to the physical, physiological and psychological needs of all persons at work.

### 5.2 Environmental, Health & Safety Guidelines (World Bank Guidelines)

In addition to operational policies (OP), the WBG has also established its EHS guidelines for all the interventions that are financed by the group. These EHS Guidelines are technical reference documents with general and sector-specific examples of Good International Industry Practice (GIIP). Following EHS guidelines are relevant to the proposed project during the construction and operation phase:

**General EHS Guidelines:** Issues associated with the construction and operation of maintenance facilities are addressed in the General EHS Guidelines with other key elements like Environment and OHS at the workplace as well as for the community.

**EHS Guidelines for Construction Materials Extraction:** Issues associated with the sourcing of construction materials are presented in the EHS Guidelines for Construction Materials Extraction.

### **5.3 The Sindh Bonded Labor System (Abolition) Act, 2015**

Act to provide for the abolition of bonded labor system in the Province of Sindh. Whereas clause (2) of Article 11 of the Constitution of the Islamic Republic of Pakistan prohibits all forms of forced labor. As well as it is necessary to provide for the abolition of bonded labor system with a view to preventing the economic and physical exploitation of the labor class in the Province of Sindh.

## **6. HAZARD IDENTIFICATION AND RISK MANAGEMENT**

Hazard Identification and Risk Management process are core activities to manage OHS/CHS risks and performance which describes additional Specific Control Requirements that outline the Projects approach to mitigating those risks.

### **6.1 Project OHS / CHS Significant Risk Summary**

Key significant inherent risks (OHS / CHS) and hazards due to a specific construction activity have been summarized as follows;

- a) Improper Lifting and Handling
- b) Use of Tools and Equipment's
- c) Excavation and Trenches
- d) Fuel /Oil Spills
- e) Medical Facility
- f) Welfare Facility / Hygienic Conditions
- g) Maintenance of Equipment's and Vehicles
- h) Storage of Hazardous Materials
- i) Electricity
- j) Inadequate Firefighting Equipment's
- k) Slips Trips, Falls from Concrete Work
- l) Motor Vehicles and Mechanized Equipment

### **6.2 Health and Safety Operational Control**

Key significant risks for the proposed project will be managed as follows:

Sr. No.	Risks / Hazards	Consequences	Health and safety operational controls
1.	Improper Lifting and Handling	<ul style="list-style-type: none"> <li>• Injury</li> <li>• Long term disability</li> <li>• Equipment damage</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate training in stepping handling and lifting techniques</li> <li>• Ensure near miss reporting structure is in place</li> <li>• Availability and correct use of PPEs</li> </ul>
2.	Use of Tools and Equipment's	<ul style="list-style-type: none"> <li>• Injury</li> <li>• Long term disability</li> <li>• Equipment / tool damage</li> </ul>	<ul style="list-style-type: none"> <li>• Unsafe or defective tools are removed from service and tagged out.</li> <li>• Power tools are turned off and motion stopped before setting down.</li> <li>• Tools are disconnected from the power source before changing drills, blades, or bits and before any repair or adjustment is made. Running tools are not left unattended.</li> <li>• Portable abrasive grinders have guards installed covering the upper and back portions of the abrasive wheel.</li> </ul>
3.	Excavation and Trenches	<ul style="list-style-type: none"> <li>• Injury</li> <li>• Fire burn</li> <li>• Equipment damage</li> </ul>	<ul style="list-style-type: none"> <li>• Any excavation or trench five feet or more in-depth is provided cave-in protection through shoring, sloping, benching, or the use of hydraulic shoring, trench shields, or trench boxes. Trenches less than five feet in depth and showing potential of cave-in are also provided cave-in protection. Specific requirements of each system are dependent upon the soil classification as determined by a competent person.</li> <li>• A competent person inspects each excavation/trench daily prior to the start of work, after every rainstorm or other hazard-increasing occurrence, and as needed throughout the shift.</li> <li>• Any material and equipment are kept at least two feet from the edge of the trench or excavation.</li> <li>• Head protection should be worn</li> <li>• Availability of first aid kits</li> </ul>
4.	Fuel /Oil Spills	<ul style="list-style-type: none"> <li>• Fuel / oil fire</li> <li>• Damaged equipment</li> <li>• Environmental impact</li> <li>• Personal injury</li> </ul>	<ul style="list-style-type: none"> <li>• Adequately trained crew in spill response plan</li> <li>• Regular safety drills</li> <li>• Hose/pipe fitting /flanges maintained &amp; and in good working condition</li> </ul>

			<ul style="list-style-type: none"> <li>• Regular checking of quick closing valves</li> <li>• All chemicals to be properly stored and documented and labelled</li> <li>• Adequate spill clean-up supplies</li> <li>• Adequate &amp; suitable waste disposal program</li> <li>• Availability of first aid kits</li> </ul>
5.	Medical Facility	<ul style="list-style-type: none"> <li>• Prolonged injuries /illness</li> <li>• Lost time</li> <li>• Spread of illness and infections to others</li> <li>• Chronic disease</li> </ul>	<ul style="list-style-type: none"> <li>• Routine employee medicals</li> <li>• Properly trained medic</li> <li>• Adequate supply of medication &amp; equipment</li> <li>• Secure storage of medication &amp; medical supplies</li> <li>• Suitable medical facilities</li> </ul>
6.	Welfare Facility / Hygienic Conditions	<ul style="list-style-type: none"> <li>• Prolonged injuries /illness</li> <li>• Lost time</li> <li>• Spread of illness and infections to others</li> <li>• Financial liability</li> <li>• Fatality</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor sponsors awareness program</li> <li>• Employee medicals to meet minimum standards</li> <li>• First aid training</li> <li>• Pre start audit of medical supplies</li> <li>• Health and hygiene monitoring</li> <li>• Provide bottled water (where practical)</li> <li>• Well defined ERP</li> <li>• Regular Cleaning Routines</li> <li>• Inspection of Food Stocks</li> <li>• Inspection of food storage</li> <li>• Inspection of water tanks &amp; water making systems</li> <li>• Basic hygiene awareness</li> <li>• Neat and clean dining area</li> <li>• Neat and clean washrooms</li> <li>• Schedules cleaning</li> </ul>
7.	Maintenance of Equipment's and Vehicles	<ul style="list-style-type: none"> <li>• Equipment's not functional</li> <li>• Frequent repairs necessary</li> <li>• Loss of control / propulsions/ steering</li> </ul>	<ul style="list-style-type: none"> <li>• Properly trained maintenance personnel's</li> <li>• Establish and maintain communication link</li> <li>• Well maintained workshops</li> <li>• Availability of spare parts</li> <li>• Availability of washing yards</li> </ul>
8.	Storage of Hazardous Materials	<ul style="list-style-type: none"> <li>• Loss of equipment</li> <li>• Air pollution</li> <li>• Personal injury</li> <li>• Long term illness</li> <li>• Slips</li> </ul>	<ul style="list-style-type: none"> <li>• All chemicals properly identified and labelled</li> <li>• All chemicals properly stored</li> <li>• All chemicals documented</li> <li>• Firefighting equipment's appropriate for specific chemicals</li> </ul>



		<ul style="list-style-type: none"> <li>• Medical cost</li> <li>• Contamination of soil</li> <li>• Contamination of ground water</li> </ul>	<ul style="list-style-type: none"> <li>• Crew to be trained</li> <li>• Proper use of chemicals</li> <li>• Appropriate PPEs available / used</li> <li>• Regular safety drills</li> <li>• Adequate and suitable waste handling &amp; disposal program</li> <li>• Contingency plan in place</li> </ul>
9.	Electricity	<ul style="list-style-type: none"> <li>• Injury</li> <li>• Fire burn</li> <li>• Medical cost</li> <li>• Lost time</li> <li>• Loose wiring</li> <li>• Improper insulation</li> </ul>	<ul style="list-style-type: none"> <li>• Do not operate wet power tools</li> <li>• Keep extensions cords out of wet areas</li> <li>• Do not store materials under power lines</li> <li>• Stay at least 10 feet back from power lines, in all directions. Stay further back if voltages are greater than 50,000 volts</li> <li>• Mark power lines on the work site with warning signs below</li> <li>• Proper insulations</li> <li>• Provisions of PPEs</li> <li>• Daily inspection</li> <li>• Replacement of damaged wires/switches/extension cords</li> </ul>
10.	Inadequate Firefighting Equipment's	<ul style="list-style-type: none"> <li>• Damaged equipment</li> <li>• Personal injury</li> <li>• Fire equipment failure</li> <li>• Fire burn</li> <li>• Fatality</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of fire extinguishers as per fire classification</li> <li>• Dedicated and adequately trained firefighting crew</li> <li>• Utilize hot work permit system</li> <li>• Prior to cutting / welding</li> <li>• Spot inspections to ensure good housekeeping standards are being maintained at site</li> <li>• Regular inspections &amp; maintenance of Firefighting Equipment</li> <li>• Location of portable Firefighting Equipment</li> </ul>
11.	Slips Trips, Falls from Concrete Work	<ul style="list-style-type: none"> <li>• Slips</li> <li>• Trips,</li> <li>• Falls,</li> <li>• Strains and Sprains,</li> <li>• Eye Injuries,</li> <li>• Chemical Burns, and</li> <li>• Silica Exposure.</li> </ul>	<ul style="list-style-type: none"> <li>• The risk assessment shall be performed for all concrete work to minimize the associated hazards</li> </ul>
12.	Motor Vehicles and Mechanized Equipment	<ul style="list-style-type: none"> <li>• Damaged equipment</li> <li>• injury</li> <li>• Equipment's not functional</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicles and equipment should be operated by qualified persons (training or experience).</li> </ul>

		<ul style="list-style-type: none"> <li>• Frequent repairs necessary</li> <li>• Loss of control / propulsions/ steering</li> </ul>	<ul style="list-style-type: none"> <li>• All equipment operators are responsible for checking, on a daily basis, all fluid levels, drive components, and hydraulics.</li> <li>• In addition, operators visually inspect the engine and look for structural breaks and cracks on the machine.</li> <li>• Any and all deficiencies must be reported to a supervisor immediately.</li> <li>• When equipment is stopped or parked, parking brakes are set and other safety precautions are taken as required for the type of equipment such as placing the forks flat on the ground.</li> <li>• Keys shall be removed from equipment at the end of each shift.</li> </ul>
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## 7. COMMUNICATIONS

### 7.1 Onsite Communication and Consultation

#### 7.1.1 Health and Safety Training

HSMP Training is necessary to provide awareness to promote HSE matters and to control, prevent or reduce risks based on HSE practices and relevant information provided to workers staff during training. HSMP training will be focus on:

- Empowering workers through sharing knowledge of HSE matters to ensure they assist in continual HSE System performance;
- Identifying, categorizing and prioritizing of hazards and risks and information thereof;
- Familiarizing with applicable processes and procedures to enable corrective or Preventive actions implemented;

Personnel working on the Project shall be instructed in their specific responsibilities as described in this HSMP before commencing work. Training records are maintained by the Training Officer. The HSE Manager monitors the content and timing of relevant training delivery, inductions and site-specific safety training requirements through discussion with the Safety Manager and inclusion of the Training Officers in the HSE Department weekly meetings.

#### 7.1.2 Inductions

New inductions may consist of, but is not limited to, the following:

- Have the worker read the health and safety plan and other safety requirements, guidelines etc. Answer any questions the new hire may have about these policies and request a signature on the Statement of Understanding.
- Orient the workers to the work site indicating the location of the emergency facilities, portable fire extinguishers, first-aid station, emergency phone numbers, public notices, and any job site-specific information.
- Explain the injury and accident policy.
- Review the written hazard communication program. Discuss hazards, container labelling, and the use of protective equipment.
- Explain the emergency response plan for catastrophic events such as fire, explosion, etc.
- Issue PPE as required for any construction work.

### **7.1.3 Health and Safety Activities, Meetings and Committees**

The Training Officer reports to Safety Engineer and is responsible for all training delivery, assessments and records maintenance. The Training Officer will be responsible for

- Identifying the need for training and ensuring personnel have appropriate training and skills to discharge their duties and responsibilities;
- Developing the Project Training Plan and maintaining records of (i) training requirements and (ii) the qualifications and training of all personnel on site.
- Training & Competency and will be responsible for the development of a training matrix which identifies individual's training requirements and for auditing the process to ensure that necessary activities are occurring as planned;

The Project Training Officer shall keep the Safety Engineer informed of proposed changes to the content and seek input or advice on HSE training & induction programs. The Safety Engineer will be responsible for health and safety activities, meetings and committees such as:

- **Daily Pre-Start Meetings**

All contractors, sub-contractors and suppliers will receive training in, and be required to conduct, a communication meeting with their workers each day prior to the commencement of work activities.

- **Weekly Toolbox Meetings**

Weekly Toolbox Meetings provide an opportunity for covering specific safety topics in greater detail than at daily PRE-START meetings, and will be used to correct "at risk behaviours" and negative safety trends as identified through Hazard Observations.

- **Time Out for Safety Training**

This is response specific training conducted as part of a corrective action after an incident or event and is delivered to rectify specific root causes identified in the event analysis, introduce new procedures or reinforce compliance with existing practices.

- **Advice and Review**

The Safety Engineer will provide advice; information and review to the Training Team on aspects of training related to HSE will include oversight of legislative, regulatory and site project procedural changes.

- **Emergency Response Co-ordination**

This will be conducted and co-ordinated by the Safety Engineer via delegation to a Site In charge with experience in ER, First Aid and Rescue.

## **7.2 Communication with Contractors and Suppliers**

An effective communications system is set up so that key personnel such as the Contractor, Suppliers, Site In charge, Safety Engineer and Inspectors, can be contacted in a timely manner.

### **7.2.1 Contractors**

Complete details of contractor safety requirements are contained in contract agreements and terms and conditions, signed acknowledgement of which is required prior to the award of any work. Contractors will be accountable for:

- Submit project specific HSMP as per HSE policy and contract requirement;
- Get approval of site specific HSMP from the Client and Supervision Consultant;
- Ensure implementation of HSMP on the project;
- Familiarity with the requirements of the HS Management Plan to ensure effective implementation, evaluation and maintenance of the project HSMP in relation to scope of work;
- Ensuring their personnel understand and comply with their health, safety and environmental responsibilities; and

To meet the above responsibilities contractors will:

- Develop and maintain vehicle and equipment registers, and maintenance and inspection records;
- Undertake risk analysis studies of their work to identify and quantify the level of risk involved as well as specific controls and actions for each work task;
- Immediately respond to any accident, incident or near miss;
- Conduct their own pre-shift pre-start meetings and weekly toolbox meetings;
- Participate in inspections, Hazard Observations (Hazobs), and HSE Committee meetings;

- Implement maintenance and inspection schedules for vehicles and equipment in accordance with site and legislative requirements;
- Ensure equipment and substances meet site requirements, hazards applicable to their work scope are identified, implementation plans are developed detailing hazard control strategies, personnel competencies are verified and individuals authorized to undertake specific tasks and activities;
- Comply with HSE requirements and objectives and any directives consistent with achieving those objectives within the scope and range of their work on the project.

## **7.2.2 Sub-Contractors/Suppliers**

The main contractor shall monitor suppliers' performance and ensure his procurement processes contain the mechanism to deliver its expectations. Moreover, complete details of sub-contractor safety requirements are contained in contract agreements and terms and conditions, signed acknowledgement of which is required prior to the award of any work.

The following procedures shall be adopted for reporting between main contractor and sub – contractors.

- All sub-contractors employed on the project shall be under the direct responsibility of main contractor;
- All sub-contractors will be expected to comply with the HSE requirements and must liaise with the site management about any difficulties they foresee that may affect HSE on site;
- All work must be carried out in accordance with the relevant statutory provisions;
- Subcontractor's employees are not permitted to alter any scaffold provided for their use or interfere with any equipment on construction site, unless authorized;
- All equipment's brought to site must be in good working condition, fitted with any necessary guard and safety devices;
- Any injury sustained or damage caused by subcontractor employees must be reported immediately to the safety officer;
- Subcontractor's employees must comply with any safety instructions given by the main contractor's HSE;
- Sub-contractors must provide suitable welfare facilities and first aid equipment in accordance with the regulations for their employees;
- Sub-contractor's material or substance which has health, fire or explosion risks must not be used and stored in accordance with regulations and current HSE recommendations;
- Sub-contractors must provide necessary protective equipment to all their employees;
- Sub-contractors must give adequate training and instruction to their workers and safety induction of all workers shall also be conducted by the main contractor's HSE prior to join the site team; and
- Sub-contractors shall provide all required information to the main contractor for the safety statistics Monthly return.

## **7.3 Community / External Communication**

### **7.3.1 Community Liaison**

Community Liaison is important to make sure local community fully aware about OHS/CHS information, monitor safety improvement activities, open communication and technical safety improvement efforts. The community liaison will take place through Contractor by starting the construction activities of proposed project.

More intangible benefits to encourage the participation community members in activities to see their ideas that can help to improve health and safety performance. People gain confidence and self-esteem through taking part in the process, and perceptions are expanded by meeting and exchanging views with people who have different values and ideas.

In particular, this must include their appropriate involvement in:

- Hazard identification, risk analysis and determination of controls.
- Incident investigation.
- The development and review of the health and safety policy and objectives.
- Community and Workers must be informed about their participation arrangements, including: Who is the representative(s) on health and safety matters?
- Time and resources necessary to participate in health and safety activities.
- Access to information that is relevant to current or planned health and safety improvement activities.
- Disciplinary actions for safety violations and non-compliances.

There must be a process for communicating about the management of OHS/CHS risks at the various levels of the managed construction site. This includes, but is not limited to:

- Internal communications to raise awareness about OHS/CHS risks, performance measures and changes or improvements.
- Pre-start meetings or briefings (e.g. toolbox talks) for sharing safety observations/ experiences, lessons learned or raising awareness about OHS/CHS risks.
- Sharing knowledge and lessons learned from around the Project (external to the site, business or site); such as relevant incidents, hazardous conditions or suggested practices.

### **7.3.2 Consultation and Complaints**

Employees and contractors will be consulted and given opportunity, encouragement, and training to be proactively involved in health and safety matters affecting the project and their work activities. All workplace consultation will be recorded. There will be a grievance process to receive feedback, suggestions and complaints on OHS and CHS matters. This process will include a procedure for documenting, evaluating, implementing (as appropriate) and archiving the improvements.

There will be a process to ensure that, when appropriate, relevant external stakeholders are consulted about pertinent OHS/CHS matters (including statutory and regulatory requirements) as needed. Communications, engagement and consultation with local community members on CHS matters were addressed in the ESMP.

## 8. TRAINING AND COMPETENCY

All workers and contractors shall attend a site-specific safety orientation prior to commencing work. A site designate will be appointed to oversee this process and will be assigned by the Project Director. At the completion of the general HSE orientation workers will be tested for their knowledge of site HSE expectations.

Workshops with the workers and contractor relating to HSE will be conducted to review progress, obstacles and issues. The purpose is to pay attention to all the issues and find corrective solutions to issues. Participation in such workshops should be to the level of site inspectors from all contract parties. These workshops shall be conducted quarterly and when necessary.

All project personnel should also have proper training needs analysis. Personnel working on the Project shall be instructed in their specific responsibilities before commencing work. The HSE Engineer will be responsible for all training delivery, assessments and records maintenance. The HSE Engineer will be responsible for identifying the need for training and ensuring personnel have appropriate training and skills.

The project training which should be received by different roles has been attached below:

### Type of Trainings to be conducted

Sr. No.	Role Type	Project Training
1.	All Workers and Contractors	General HSE Orientation
2.	All Workers and Contractors	Safe Working Procedures
3.	All Workers and Contractors	Hazard Risk Identification, Assessment and Control
4.	All Workers and Contractors	Effective use of PPEs
5.	All Workers and Contractors	First Aid
6.	All Workers and Contractors	Fire Fighting
7.	All Workers and Contractors	Accident, Incident and Near Miss Investigation
8.	All Workers and Contractors	Emergence Preparedness and Response

### 8.1 Awareness and Competency

Awareness and competency considerations by contractors will be including:

- Safety induction and training to raise awareness levels;
- Task specific competency assessments conducted by the Contractor;
- Training and induction specific to the area where construction work will be going to start; and

- Competency assessment and required training to render workers/contractors competent to carry out the work activity.

## **9. EMERGENCY MANAGEMENT**

### **9.1 Emergency Response**

Emergency plans are prepared for the project to identify the potential for and response to emergency situations, and for preventing and mitigating the impacts that may be associated with them. Efficient management of emergency situations demands that all parties respond in a controlled and coordinated manner.

The Contractor will be responsible to respond to, and participate in, any emergencies that may occur to ensure that Site Emergency Plans are prepared and that adequate resources are provided and fit for purpose for the control and management of emergency situations. Contractor should participate by identifying their qualified first aid personnel.

The Emergency Response Preparedness Plan (ERP) provides guidelines for the response required in the event of:

- Injury
- Fire
- Security
- Natural Disaster
- Any other emergency at a work site.

As part of the emergency response plan, an emergency contact list will be mounted at the construction site premises and camp site. The emergency response team will consist of the site in charge, safety engineers, inspectors and workers at the construction site. Emergency assembly/muster points will be predetermined locations where all personnel will gather in case of an emergency evacuation. The main responsibility during an emergency coordination is to respond to the call for emergency help. The project manager must be able to respond to and participate in any emergencies that occur.

As a minimum, the site in charge through the Training Officer, and in consultation with the HSE engineer, will ensure that response plans are developed and sufficient training should be provided to deal with the following:

- Fire or Explosion within the project boundary
- Medical Emergencies, Illness or Injury
- Rescue from Height
- Confined Space Rescue
- Crane or Structural Failure / Collapse
- Trench or Excavation Collapse
- Chemical Spill
- Accident; and
- Security Incident / Acts of insubordination



## 9.2 Fire Protection and Prevention

Firefighting equipment will be placed at strategic locations at the camp offices and Project sites. The following instructions have to be carried out in case of fire or fire drills.

- Shout “FIRE, FIRE”
- Notify immediate supervisor, fire wardens.
- Leave the area and assemble at outside the gate of camp site.

### Fire Wardens Must:

- If fire is controllable; fight and control to prevent fire from spreading.
- Make sure that the power supply is cut off
- Check all offices and residential area and make sure that no buddy is left inside
- Carry out a head count of all personnel by using daily POB list available at camp
- If fire is not controllable; everybody will evacuate the area immediately.
- Caution signboard be installed outside the fire catching area at site and office
- Site in charge will coordinate with local fire fighting agencies.
- Record pertinent information for follow up investigation.
- The fire buckets and fire extinguishers must have monitored timely
- Training
- Emergency plan should be developed to handle any condition
- High risk fire activities such as welding, smoking policy, fuel storage and fire inspections must be banned at near construction area zone
- Firefighting drill should be practice at site

## 9.3 Hazardous Substance Spill Response and Prevention

Site in charge and safety engineer shall jointly ensure that all personnel involved in the storage, use, handling, transport and disposal of Hazardous Materials or Substances are trained in the procedures for handling Hazardous Substances and have access to and know the whereabouts of manufacturers Material Safety Data Sheets (MSDS) prior to commencing work with these materials. Spills of chemical, fuels, and other hazardous substances may occur as isolated events or they may occur in association with other emergencies such as fire, explosion, natural causes, or accident.

There are six distinct steps

- Communicate event
- Spill details
- Control of scene
- Spill containment kit retrieval
- Spill/release clean up
- Disposal of contaminated materials

Transfer and disposal of hazardous waste will be conducted as per jurisdictional legislated requirements and only by a licensed hauler/disposal agency with properly trained employees.

Note: Contractor that is found responsible for the spill or release will be held accountable for all costs associated with the response, clean-up.

#### **9.4 First Aid and Medical Facilities**

First aid and medical facilities will include adequate and quality equipment, first aid drugs and pharmaceuticals, consumables, facilities and equipment to be located in camp site and project offices. First Aid Kits shall be supplied, maintained by Contractors and must:

- Be immediately accessible to all personnel on site and in their work area, so far as is reasonably practicable.
- Have emergency contact numbers located in the kits along with resuscitation charts, a content list, response log and pen.
- Be clearly marked and numbered for identification and the contents inspected once every two weeks for acceptability and completeness.

The assigned persons responsible for checking the contents of the kit will be safety engineers/inspectors. This duty will include cleaning the outside and inside of the kit, tidying up the contents and checking everything is in date. This task will be under the site in charge of that respective area/location and the status of all Kits and locations shall be reported to the Safety Committee each fortnight.

#### **11 SITE SECURITY PLAN**

The purpose is to prevent loss caused by intentional acts and reduce the opportunity for public incidents in our workplaces.

Fencing and/or physical barriers during excavation work will keep the general public off the site and to keep materials and equipment inside the site.

Any personnel and contractor's workers that return to the project after hours or on weekends must be authorized to do so by the Contractor. Contractor is responsible for their own shipping and receiving of materials and equipment's on construction site.

#### **12 INCIDENT REPORTING AND INVESTIGATION**

Under the OHS Act and other legislative requirements all employees are required to report any incidents or hazards that they have observed or been involved in, or any conditions that may injure workers and community at construction site.

All incidents will be investigated by the relevant supervisor with support from HSE personnel and elected Health & Safety Representatives and appropriate corrective and preventive actions put in place.

##### **12.1 Roles and Responsibilities**

An incident investigation team will comprise of selected personnel who will form to undertake an investigation. It will also include:

- The Supervisor (Contractor) of the worker(s) involved

- The worker(s) involved in the incident
- Such technical personnel who will provide support services
- An elected Health & Safety Representative i.e., Site Engineers and Inspectors
- Other personnel may be invited to participate should the need arise.

## **12.2 Management of Incidents**

All types of incidents/accidents are immediately informed by telephone, email or any other means to;

- Relevant Project Director/Resident Engineer
- HSE Officer.

HSE Officer should immediately proceed to the location of the accident as soon as he receives the Information/call.

- Assess the situation.
- Find out the type of emergency.
- Check out if anyone is injured.
- In case of minor injury first aid shall be provided immediately.

Medical practitioner shall ensure that any occupational diseases or infectious diseases are reported to HSE OFFICER within 24 hours of the condition becoming medically diagnosed.

In case of serious accident call the concerned emergency services i.e. Police, Ambulance, and Fire brigade. Establish contact with the nearest hospital so that immediate medical attention can be made available in case of emergencies. Cordon off the location of the accident by using caution tapes and cones. Do not allow un-authorized access.

### **12.2.1 Investigation of Incident and Near Miss**

Project Director/ Contractor relevant personnel will be responsible for;

- Collect evidence before it is moved or altered.
- Take necessary photograph.
- Speak to eye witnesses and collect facts.
- Ensure that rumors and false information are not spread

### **12.2.2 Corrective and Preventive Actions**

The Safety Engineer will review and analyse all incident reports to ensure effective immediate and root analysis has been determined, and corrective actions proposed to prevent recurrence. The Safety Engineer will ensure all corrective actions are entered onto the site Action Register and will monitor the controls put in place to ensure compliance with Health & Safety standards by:

- Analysing all processes, work operations, concessions, environmental records, service reports and customer complaints to detect and eliminate potential causes of non-conformances.

- Initiating preventive actions to deal with problems to a level corresponding to the risks encountered.
- Implementing and recording changes in procedures resulting from corrective action.
- Maintaining records of reviews of corrective actions.

### **12.2.3 Reporting and Recording**

All types of injuries will be reported to Project Director immediately by telephone, email or any other means. List of emergency contact numbers will be prepared and displayed at all prominent places at work site. This list should be available 24 hours a day 7 days a week. The types of accidents (indicative) that require immediate notification are as follows:

- Fatality;
- Any fracture other than finger, thumbs or toes;
- Any amputation;
- Dislocation of the shoulder, hip, knee or spine;
- Loss of sight (temporary or permanent);
- A chemical or hot metal burn to the eye;
- Penetrating eye injury;
- Any injury resulting from an electric shock which causes unconsciousness;
- Any injury resulting from an electric shock which requires resuscitation;
- Any injury resulting from an electric shock which requires hospital admittance for more than 24 hours;
- Any other injury that results in unconsciousness or the casualty needing resuscitation;
- Any injury resulting in the casualty being admitted to hospital for more than 24 hours;

### **12.3 Injury Management**

Injuries shall be managed according to Procedure. An Injury Management Worker will be nominated, however this position will be hired by Site in charge / Safety engineer. The person nominated for this position must hold appropriate qualifications and be competent in this area.

## **13 PROJECT HEALTH AND SAFETY PERFORMANCE**

### **13.1 Measuring and Monitoring**

The following activities and events shall be monitored, and measured against predetermined KPI's, to evaluate the extent to which they comply with the requirements detailed in this HSMP

- Incident and Injury Reports
- Hazard Observations
- Workplace Inspections
- PRE-START Meetings and Toolbox Talks

- Equipment inspections
- Induction and training programs
- Emergency Response exercises

The health safety engineer is responsible for development of processes required to monitor, measure and analyse the performance of the HSMP.

Additional monitoring of the construction site for noise, dust and atmospheric contaminants will be undertaken in conjunction with the client and in accordance with the statutory obligations and the requirements of the HSMP

Specific details on the planned requirements, and the means by which data will be gathered and reported upon, are contained in the 'Key Performance Indicators' described below.

### 13.2 Key Performance Indicators

The Projects KPI's are displayed below.

#### Key Performance Indicators

<b>KPI</b>	<b>Measurement</b>	<b>Monitoring Mechanism</b>	<b>Responsibility and Frequency</b>
<b>Incident Injury Free (IIF)</b>	<p>% of persons that have attended 4 hour IIF orientation program Vs total number of persons</p> <p>% of persons attending mandatory HSE meetings Vs. persons invited (less R&amp;R factor)</p> <p>% of completed RSI workstation assessments Vs. total persons</p>	<p>No. to provide via their induction attendance registers</p> <p>Sign on sheets for Toolbox meetings and other scheduled meetings.</p> <p>Documented records of assessment to target</p>	<p>The Training Officer will be responsible for gathering the attendance records.</p> <p>The Training Officer will track the data as meetings occur and with summary tables available monthly.</p> <p>The HSE Manager, or delegate, will track and update the rate monthly.</p>
<b>Behavioural Based Safety Observations</b>	<p>No. of Observations planned Vs. No. of Observations conducted</p> <p>% of At Risk behaviours observed Vs. Safe behaviours observed</p>	<p>BBS Observation forms by total hours worked for the period</p> <p>BBS Observation forms (Safe v At Risk observations for the period)</p>	<p>The HSE Manager, or delegate, will collect the observation forms and evaluate the percentage on a biweekly basis.</p>
<b>Senior Management Leadership in HSE</b>	<p>No. of documented inspections and contacts conducted by visiting Senior Management Vs. No. of visits</p>	<p>Completed Inspection Reports</p> <p>Travel records</p>	<p>The HSE Manager, or delegate, will collect the inspection forms after each Senior Management's visit. This</p>
<b>Site Management</b>	<p>No. of documented inspections conducted.</p>	<p>Formal HSMP Inspection Reports</p>	<p>The HSE Manager, or delegate, will track the data as meetings occur.</p>

<b>KPI</b>	<b>Measurement</b>	<b>Monitoring Mechanism</b>	<b>Responsibility and Frequency</b>
<b>Leadership in HSE</b>	% Actual attendance at HSE meetings Vs. scheduled.	Meeting attendance register	
<b>Effective implementation of planned HSE Training Activities (HR)</b>	% Actual attendance at training Vs. scheduled training	HSE Training Plan, Training attendance register.	The Training Officer will track all planned and actual training on a weekly basis.
<b>CHESM/Loss Prevention Inspections</b>	No. of actual CHESM/Loss prevention Inspections completed Vs. planned.  % Compliance with Inspection (less R&R)	KPI Register for Management, Supervision and HSE  number planned versus number completed	The HSE Manager, or delegate, will track the inspections on a biweekly basis.
<b>New Worker Management (SSE) (HR)</b>	% of actual inexperienced workers to the job Vs. planned.	Review of mobilisation Records, workplace inspections.	The HR/IR Manager, or delegate, will track quantity of Short Service Employees on a monthly basis.
<b>Action Tracking</b>	% of Actions closed out by due date Incident/Injury/Hazard Reporting Register  % of Actions outstanding for more than 7 days from due date	Incident Injury hazard reporting register  Inspection/Audit Reports Hazard Action Register	The HSE Manager, or delegate, will track the required actions after each audit until all are resolved.
<b>HAZOBS</b>	% of high & medium impact items completed by due date	HAZOB Register	The HSE Manager, or delegate, will track HAZOB register on a biweekly basis.
<b>Emergency Management</b>	% of actual Emergency Exercises conducted Vs. scheduled	Emergency Response Plan	The HSE Manager, or delegate, will track the exercises on a Monthly basis.
<b>Audits</b>	% of planned audits conducted Vs. scheduled	Audit schedule	The HSE Manager, or delegate, will track the Audits on a quarterly basis.
<b>Driver Safety</b>	No. of driving infractions recorded	Driving Improvement Monitors – report from IVMS supplier	The HSE Manager, or delegate, will review the reports provided by the IVMS Supplier monthly and advise the relevant Supervisors of any infractions.
<b>Exposure Hours</b>	Total Exposure Hours	Work hour reports	Project Controls will maintain a current log of project hours.

<b>KPI</b>	<b>Measurement</b>	<b>Monitoring Mechanism</b>	<b>Responsibility and Frequency</b>
<b>Days Away From Work Rate</b>	No. of DAFW injuries x 200,000 / exposure hours	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track all DAFW s and update the rate weekly.
<b>Medical Treatment Injury Rate (MTIR)</b>	No. of MTI injuries x 200,000 / exposure hours	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track all MTIs and update the rate weekly.
<b>Total Recordable Injury Rate (TRIFR)</b>	No. of recordable injuries x 200,000 / exposure hours	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track all Recordable Injuries and update the rate weekly.
<b>Restricted Work Injury Rate (RWIR)</b>	No. of RWI injuries x 200,000 / exposure hours	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track RWIs and update the rate weekly.
<b>Incidence Rate</b>	No. of incidents/injuries X100 / No. of Workers		The HSE Manager, or delegate, will track and update the Incident rate weekly.
<b>Ergonomic/Strain Injuries</b>	% of Manual Handling/RSI Injuries Vs. total injuries	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the rate as they occur.
<b>Fitness for Duty</b>	% of Heat Stress/Fatigue Injuries Vs. total injuries	Incident/Injury/Hazard/Reports	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Permit To Work</b>	% breaches of PTW system Vs. total incidents	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Near Miss Incidents (NMI)</b>	No. of NM incidents  % of level 2 NMI's Vs. total incident reports  % of increases in trends	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Compensation</b>	No. of Workers Compensation Claims	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the number of claims weekly.
<b>Motor Vehicle Crash Rate (MVCR)</b>	No. of Motor Vehicle Crashes	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the quantity weekly.
<b>Marine Vessel Incidents</b>	No. of Marine Vessel incidents reported through incident reports	Incident/Injury/Hazard Reports	The HSE Manager, or delegate, will track and update the quantity weekly.
<b>Restricted Work Hours</b>	No. of hours lost due to injury/illness Incident/Injury/Hazard Reports	Rehabilitation reports	The HSE Manager, or delegate, will track and update the quantity weekly.

<b>KPI</b>	<b>Measurement</b>	<b>Monitoring Mechanism</b>	<b>Responsibility and Frequency</b>
<b>Security Incidents</b>	No. of Security Incidents	Security Management Plan	The HSE Manager, or delegate, will track and update the quantity weekly.
<b>Risk Management</b>	% of risk reduction actions closed out by due date Vs. total actions	Design/Construction Risk Management Implementation Plan and Hazard Action Tracking Register	The Project Director will be responsible for closing the actions. The HSE Manager, or delegate, will track and update the percent completed as they are identified.
<b>Competency of Personnel</b>	% of incidents with a root cause related to inadequate competency	Incident/Injury Reports, Training and competency plan	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Compliance with Safe Work Practices</b>	% of incidents with a root cause related to inadequate implementation of Safe Work Practices and WMS/JHA Vs. total incidents	Safe Work Practices/Procedures, JHA's and WMS's	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Sub-Contractor Management</b>	% of repeated incidents by subcontractor Vs. total incidents  % compliance with CHESM Inspection items Vs. total CHESM Inspection items	Incident/Injury/Hazard Reports  HESM Inspection Check sheets	The HSE Manager, or delegate, will track and update the rate weekly.
<b>Regulatory Notices Issued</b>	No. of Notices issued by Regulatory Authority	Improvement/Prohibition Notices	The HSE Manager, or delegate, will track and update the sty as they occur.

### 13.3 Audits and Inspections

Audits are much more detailed than inspections and focus on the overall HSE process management system. This includes such items as communication, administration, documentation, HSE education, training, practices, and procedures. The HSMP shall be audited internally by the Consultant staff and externally by PIU-KWSSIP. During these audits, the auditors will determine if the risks are being mitigated as described and whether the measures of success (e.g. KPIs) are being achieved.

Audit findings will indicate areas that are good and areas that may need some improvement. Action plans will be developed with responsibilities delegated and timelines designated for items of improvement.

The purpose of an inspection is to identify conditions and hazards on the construction site that can lead to an incident and identify positive conditions, behaviors, and observations.

Informal inspections will include the daily visual inspection of construction site conditions. These inspections are conducted by safety engineers /inspectors and workers as a part of their regular



work tasks.

Note: Contractor will submit a weekly safety inspection report to the consultant with hazards and corrective actions identified.

Formal inspections are documented visual tours of the construction site, used to identify hazards and hazardous conditions. Formal project inspections will be conducted weekly by the consultant staff. All noted deficiencies will be signed off on the HSE Inspection Checklist.

Note: Contractor will be required to conduct and submit a monthly formal safety inspection report to the consultant staff with hazards and corrective actions identified.

### **13.3.1 Hazard Classification for Inspections**

When a non-conformance item will be identified (during an inspection), a hazard classification is assigned. The hazard classification rating system contains the following:

**Class A Hazard** - A condition or practice likely to cause permanent disability, loss of life or body part, or extensive loss of structure, equipment or material, or significant negative environmental impact that has the potential to be reported to authorities.

**Class B Hazard** - A condition or practice likely to cause serious injury or illness resulting in temporary disability or property damage that is disruptive but not extensive.

**Class C Hazard** - A condition or practice likely to cause minor (non-disabling) injury or illness, or non- disruptive property damage.

## **14 Management of Change (MOC)**

### **14.1 New Significant Risk/ Hazard Identified**

New Significant Risk/ Hazard which is identified will be timely assessed and detailed in the Hazard register. The objective is to ensure new significant OHS/CHS hazards are timely identified, and their resulting risks to people, property, assets and the environment are evaluated and managed. When identify a new significant hazard, following types of information from a health and safety perspective should be reviewed:

- Previous experience with type of work and its hazards
- Observations and employee concerns
- Inspections
- Audits
- Incident investigation
- Examining records
- Task and process analysis

## **15 Management Review**

Management will review the HSMP at annual intervals to ensure its continued suitability, adequacy, and effectiveness. The review will evaluate the need for changes in respect of progress on the following items:

- Changes in policy or objectives.
- Additions or changes to standard procedures
- Amendments to KPI's
- Audit & assessment findings

Feedback from consultant, client, workers and other stakeholders shall likewise be considered and where opportunities for improvement are identified, or activities deemed no longer valid, the changes necessary to rectify the situation shall be entered into this HSMP.

**Annex-XIV**  
**Emergency Response Plan**

## **Emergency Response Plan**

### **1. Introduction**

Emergency management can be defined as the organization, coordination and implementation of a range of measures to prevent, mitigate, respond to, overcome and recover from the consequences of emergency events affecting the community, its assets and the environment.

### **2. Purpose of Plan**

This plan intends to provide a framework for safety and security to infrastructure, people and vehicles. It assigns responsibility to organizations and individuals for carrying out specific actions at projected times and places in an emergency situation that exceeds the capability or routine responsibility of any one agency.

The emergency response plan provides guidance to;

- Prevent any potential sources causing hazard to the resources during all stages of the project;
- Coordinate between various organizations to take actions in case of emergencies;
- Protect people and property in emergencies and disasters;
- Develop procedures to respond to the emergencies efficiently;
- Identify and ensure availability of personnel, equipment, facilities, supplies, and other resources for use in order to provide timely and efficient response and recovery operations; and
- Confirm that measures taken in an incident are adequate to recover the affected resources or further improvements are needed.

### **3. Planning**

#### **i. Emergency Response Team**

A group/ team shall be dedicated to identify and control potential emergencies during the construction and operation of the project. The roles and responsibilities of the group members shall be clearly defined.

The primary responsibilities of the group are described below:

- Identify the potential hazard or risk sources that can lead to emergency situations; Ensure availability of adequate resources, procedures and communication system to deal with the identified emergency situations;
- Ensure awareness and training of the staff to facilitate implementation of the emergency response plan;
- Maintaining the records of any previous incidents; and
- Post-event analysis to bridge the gaps of the existing risk prevention procedures.

The emergency response team shall include but not limited to the following;



**A. Site Incharge**

- Approve/ modify devised measures to prevent or mitigate the risks associated with the identified risk sources;
- Arrange resources for dealing with potential emergencies including, financial, equipment and personnel required to deal with emergencies;
- Assure that the Emergency Response Plan is adequate, effective and implementable.

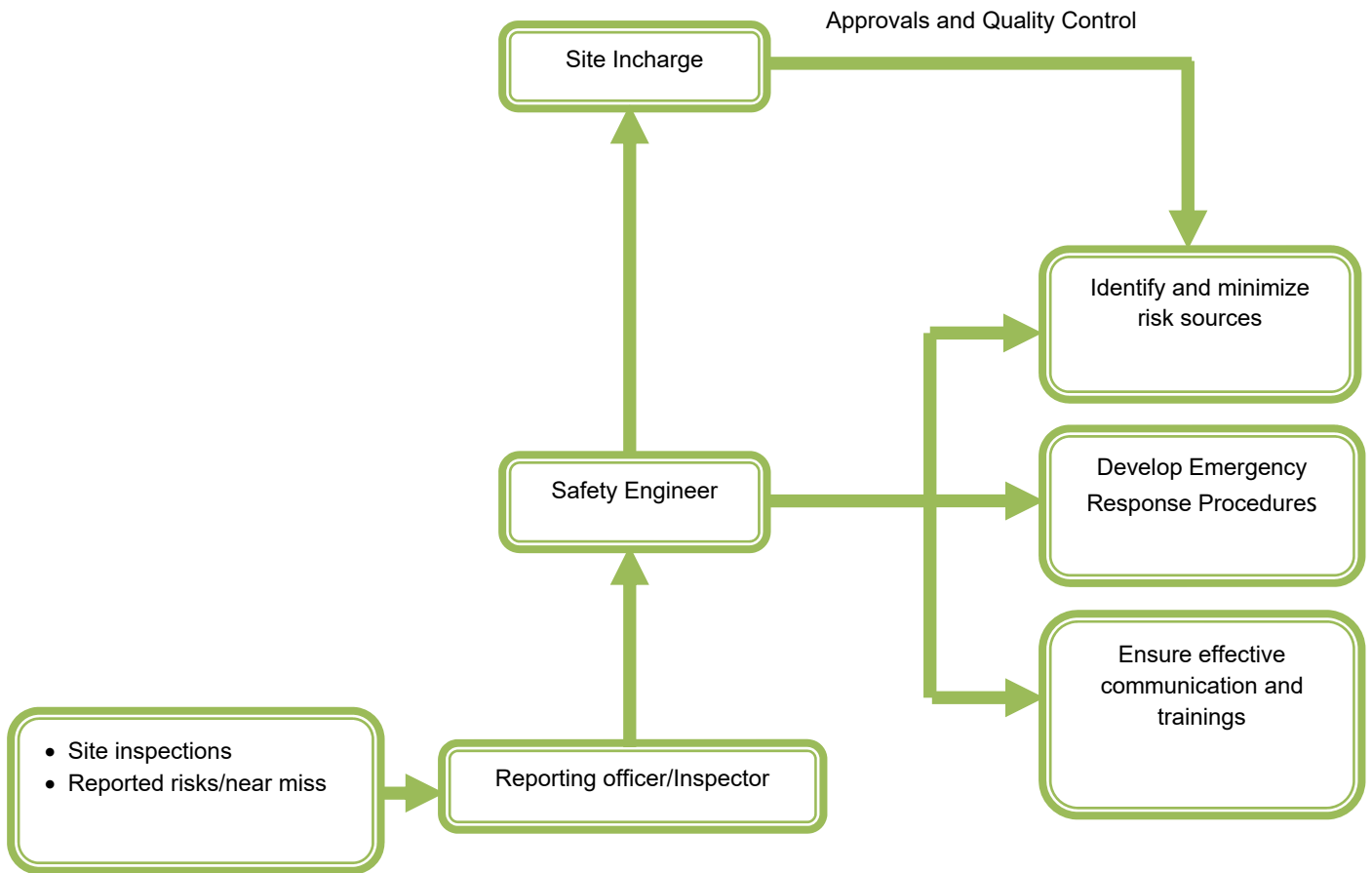
**B. Safety Engineer**

- Analyze the Identified risk sources and devise measures to prevent or mitigate the risks in close consultation with the Team Leader;
- Develop and implement the Emergency Response Procedures, in case of the possible emergencies arise;
- Ensure effective internal and external communication; and
- Provide regular trainings and arrange drills to make people aware of dealing with emergencies.

**C. Reporting officer/Inspector**

- Regular inspections of the site, to identify potential risks associated with equipment, materials and work practices;
- Anybody from the site can notify the reporting officer about potential risk and/ or near-misses on the site;
- Record any identified risks and mitigation measures to control the identified risk; and
- Notify the issue and control measures taken thereby to the safety engineer.

The designation, roles and responsibilities of each member shall be clearly defined and communicated to the employees. An outline of the framework of responsibilities is presented in the following organizational chart:



## ii. Hazard Identification

A comprehensive identification and evaluation of the hazards/ risks likely to cause an emergency shall be done by Emergency Response Team (ERT). Major potential emergencies identified in projects are as follows:

- Fire
- Earthquake
- Terrorism (including bombing)
- Disease Outbreak
- Structural failure
- Disruption of Utilities (Power, Water, Telecommunications, Gas, etc.)
- Accidents (falls, slips, electric shocks etc.)
- Vehicular accident
- Failure of trenches
- Power/ equipment failure
- Vandalism

### **iii. Prevention and Mitigation**

The ERT shall work to eliminate or reduce the impact of identified emergencies and increasing the resilience of an affected community to recover from the consequences of such events. These activities include:

- Design considerations to control flooding, earthquakes and adequate lightening for fog etc.;
- Regular inspection and maintenance of construction machinery and the structural integrity;
- Review of work schedules based on weather updates; and
- Security controls based on political situations.

## **4. Emergency Preparedness**

The ERT shall be prepared with all necessary resources and the personnel shall be trained regularly.

### **i. Resources**

#### **Finance and administration**

The financial resources shall be reserved for dealing with any emergencies arising on site during construction. Responsibilities of the person managing the resources in case of emergencies shall be clearly defined and the required resources shall be adequate and updated regularly.

#### **Equipment**

All the necessary equipment needed in an event of emergencies shall be made available, as a minimum, the equipment needed include;

- Personal Protective Equipment
- Alarms/ Warnings
- Fire extinguishers
- Crowd control, flashlights, signs, barricades
- First Aid Facility
- Detection instruments, e.g. personal alarm kits; smoke detection instruments
- Tools to fix minor vandalism

#### **Communication**

All external and internal communication systems shall be made available. Local emergency numbers shall be clearly posted and communicated to the personnel involved in construction.

The local emergency numbers are given below, which shall be regularly updated.

### **Emergency Numbers**

	<b>Service</b>	<b>Karachi (021)</b>
1	Edhi Services	241 3232
2	Edhi Ambulance	115
3	Emergency Police	15
4	Fire Brigade Center	16
5	Civil Hospital	021-99215740
6	Chippa Service	1020

### **Trainings**

Personnel shall be made aware of the importance of safety, potential emergencies and how to respond in case of emergencies. One day training and mock exercise shall be done to prepare, the personnel to deal with emergencies.

### **5. Emergency Response**

Response includes actions taken to reduce the impacts of an emergency event, and to limit the threat to life, property and the environment.

The emergencies can be dealt with:

- On-site Management of the situation
- Off-site coordination to arrange necessary resources to support the on-site management
- Providing advice and reports of the situation to stakeholders

#### **i. Emergency Response Procedure:**

Any person can report about an emergency, an on-site worker, an outside agency, or the public. Circumstances change during the course of an emergency in different events, thus, the procedure will vary as per the specific situation on ground. However, a basic action plan to be followed in an emergency is discussed below. This order of response is applicable to almost any emergency and should be followed in sequence.

#### **Assess the situation:**

The most important thing to do in case of emergency is to stay calm and avoid panic. Assess the situation, the cause and most immediate requirement to control, limit and/ or manage the immediate, ongoing, or further damage.



### **Immediate control:**

The most senior person on the scene should take control and contact, or delegate someone to contact emergency services as posted and communicated by ERT and inform the reporting officer of ERT and explain the situation. The area of emergency shall be restricted by barricades, tapes and adequate signage, if and as required.

### **Protection from further losses:**

- Once the site is restricted, to provide protection and reduce further losses, the source causing the emergency shall be controlled including equipment, materials, environment and accident scene from continuing damage or further hazards to the area and people. e.g.: suppress fire, prevent objects from falling, shut down equipment or utilities, and take other necessary measures as required depending upon the type of emergency
- Provide first aid if required or in doing so.
- Designate people to emergency duties. e.g: assign personnel to guide emergency services on arrival.
- Headcount People/ personnel to identify any missing persons.
- People/ personnel shall be directed to safe location.
- Arrange diversions for the traffic to reduce disturbance to the flow of traffic, if and as far as possible.
- Preserve the accident scene until experts mark it safe; only disturb what is essential to maintain life or relieve human suffering and prevent immediate or further losses.

### **ii. Communication:**

#### **Emergency service providers:**

The emergency service providers' needs to be kept informed of the situation. On site, personnel from the emergency services shall be guided towards the emergency scene, brief about the event, ongoing and potential hazards and cause(s), if known.

#### **Emergency Response Team and Management:**

Members of ERT shall be immediately informed and the management shall also be kept informed.

#### **Public:**

Timely notifications to public shall be disseminated through electronic and print media depending upon the requirement and urgency of the emergency so that they can adopt alternate routes and avoid the hazards associated with the emergency encountered.

### **Utilities:**

In case of disruption of utilities, the utility control authorities shall be immediately contacted to control the situation.

### **6. Recovery:**

Emergency affected individuals, communities and infrastructure shall be restored in terms of emotional, economic, and physical wellbeing including the following as a minimum:

- A detailed analysis and assessment of causes of emergency, extent of damage and gaps if any, in managing the emergency;
- Recovery/ replacement of the assets and infrastructure;
- Reinstatement of disrupted services;
- Updating of safety arrangements and Emergency response procedures to ensure better safety and security in any other arising emergencies.

**Annex-XV**  
**Site Rehabilitation Plan**

## **SITE REHABILITATION PLAN**

The project site should be rehabilitated after the completion of construction work. The rehabilitation will include following:

- Rehabilitation of construction camp site
- Removal of construction waste and debris
- Rehabilitation of road after laying of water/ sewer pipes

### **1. Rehabilitation of construction camp site**

The construction camps will damage the camp site/area by following:

- Generation of solid waste;
- Generation of wastewater;
- Damage to soil due to compaction by the camps/containers;
- Damage to air quality by the operation of generators or burning of fuels;
- Hunting and poaching of animals; and
- Damage to resources.

Following measures should be adopted to rehabilitate the campsite:

- The removed/damaged flora should be replanted;
- The solid waste should be removed from the site and disposed of to the dumping area;
- Wastewater generated from the site should be either directed to the sewerage system or removed through the suction trucks;
- Soil should be reclaimed and rehabilitated; and
- Buildings may be used for any other purpose

### **2. Removal of construction waste and debris from site**

The construction waste and debris generated at the site should be segregated and removed from the site by a licensed contractor.

**Annex-XVI**  
**Code of Conduct of Workers**

## Workers' Code of Conduct

I, \_\_\_\_\_, acknowledge that preventing any misconduct as stipulated in this code of conduct, including sexual exploitation and abuse (SEA), sexual harassment (SH), and child abuse/exploitation are important. Any activity, which constitute acts of gross misconduct are therefore grounds for sanctions, penalties or even termination of employment. All forms of misconduct are unacceptable be it on the work site, the work site surroundings, or at worker's camps. Prosecution of those who commit any such misconduct will be pursued as appropriate. I agree that while working on this project, I will:

1. Consent to security background check;
2. Treat women, children (persons under the age of 18) and persons with disability with respect regardless of race, colour, language, religion, political or other opinion, national, ethnic or social origin, property, birth or other status;
3. Not use language or behaviour towards men, women or children/learners that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate;
4. Carry out his/her duties competently and diligently;
5. Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person;
6. Maintain a safe working environment including by:
  - a. Ensuring that workplaces, machinery, equipment and processes under each person's control are safe and without risk to health;
  - b. Wearing required personal protective equipment;
  - c. Using appropriate measures relating to chemical, physical and biological substances and agents; and
  - d. Following applicable emergency operating procedures.
7. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and danger to his/her life or health;
8. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
9. Not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favours, and other unwanted verbal or physical conduct of a sexual nature with other Contractor's or Employer's Personnel;
10. Not participate in sexual activity with children/learners—including grooming or through digital media. Mistaken belief regarding the age of a child and consent from the child is not a defence;
11. Not exchange money, employment, goods, or services for sex, with community members including sexual favours or other forms of humiliating, degrading or exploitative behaviour;
12. Attend trainings related to HIV and AIDS, SAE/SH, occupational health and any other relevant courses on safety as requested by my employer;

13. Report to the relevant committee any situation where I may have concerns or suspicions regarding acts of misconduct by a fellow worker, whether in my company or not, or any breaches of this code of conduct provided it is done in good faith;
14. Regarding children (under the age of 18):
  - a) Refrain from hiring children for domestic or other labour, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
  - b) Comply with all relevant local legislation, including labour laws in relation to child labour.
15. Refrain from any form of theft for assets and facilities including from surrounding communities.
16. Remain in designated working area during working hours;
17. Refrain from possession of alcohol and illegal drugs and other controlled substances in the workplace and being under influence of these substances on the job and during working hours;
18. Follow prescribed environmental occupation health and safety standards;
19. Channel grievances through the established grievance redress mechanism.

I understand that the onus is on me to use common sense and avoid actions or behaviours that could be construed as misconduct or breach this code of conduct.

I acknowledge that I have read and understand this Code of Conduct, and the implications have been explained with regard to sanctions on-going employment should I not comply.

Signed by: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

For the Employer/Contractor

Signed by: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# **Annex-XVII**

## **ECOPs**



## **Environmental Codes of Practice**

### **1. Rationale of this ECOPs**

This Environmental Codes of Practice (ECOPs) sets out standards and procedures for managing the potential environmental impacts associating with the construction activities for, which is 'Priority Sewer Network Rehabilitation' under Assignment C Component-2 of SOP-1 for KWSSIP. The environmental impacts associated with this small civil work are considered to be minor, temporary and reversible, and readily managed with good practices during implementation. The ECOPs lay out outline simple rules and procedures regarding identification, monitoring and mitigation of those environmental impacts. The ECOPs shall be included in all relevant contracts.

### **2. Environmental Screening and Assessment**

During construction, the potential impacts include dust and solid waste generation associated with minor civil work activities. These impacts are small, localized and can be mitigated by incorporating good civil work practices, including proper housekeeping measures, proper material storage and disposal of solid waste and pollution control.

In addition, to ensure the environmental sanitation and safety during operation, it is requested that design for chlorination stations shall be in line with the quality standards including appropriate ventilation, trash bin, lighting, fire extinguisher, eye-wash facilities and toilet facilities etc.

### **3. Project ECOP Implementation Arrangements**

#### **a. The Project Implementation Unit (PIU) – KWSSIP**

The PIU-KWSSIP will be responsible for over-sighting the implementation of project. During implementation, the PIU is responsible for ensuring that the ECOPs will be incorporated in the bidding document and complied by contractors. The PIU has ultimate responsibility in the event of non-compliance with the ECOP during construction.

#### **b. The Contractor**

The Contractor, has the responsibility of establishing and maintaining contact with the PIU or delegated agencies and local residents and keeping them informed of construction matters likely to affect them. The Contractor and any agents or Sub-Contractors will be contractually required to comply with the requirements as specified in the ECOPs. The Contractor will responsible for implementation of the ECOPs, including workplace safety, and will ensure adequate resources are available for the implementation of the ECOPs throughout the construction period.

The Contractor has a duty to inform local residents likely to be affected by such activities at least 14 days prior to undertaking the works, as well as applying for the appropriate permits and licenses.

### **4. Construction Activities and Environmental Rules for Contractors**

## **a. Management of Construction Site**

This part describes basic requirements for all Contractors carrying out minor construction activities. It will be included in all construction contracts of the civil works. The Contractor is required to minimize, as far as reasonably practicable, any adverse environmental impact of their construction activities.

### ***Prohibitions***

The following activities are prohibited on or near the project site:

- (a) Cutting of trees for any reason outside the approved construction area;
- (b) Illegal dumping of demolition material and debris.
- (c) Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
- (d) Disturbance to anything with architectural or historical value;
- (e) No burning of waste
- (f) Use of alcohol by workers.

***Working hours:*** Core working hours will be from 0800 to 1800 on weekdays and 0800 to 1300 on weekend. Individual site requirements which differ from the above will be considered on a site-by-site basis. Noisy operations shall not take place outside these hours without prior approval from the PIU and/or delegated agencies and local authorities.

***Good housekeeping:*** The Contractor will follow a 'good housekeeping' policy at all times. This will include, but not necessarily be limited to the following: Ensure considerate site behavior of the Contractor's staff; Prohibit open fires; Ensure that appropriate provisions for dust control and road cleanliness are implemented; Remove rubbish at frequent intervals, leaving the site clean and tidy; Remove food waste; Frequently inspect, repair and re-paint as necessary all site hoardings to comply with the local conditions and local regulations, all flying post/ board is to be removed as soon as reasonably practicable and within 24 hours of notice; Maintain toilet facilities and other welfare facilities for its staff;

***Public information and site access:*** As a minimum, the Contractor will provide public information on the site program (start and finish dates), plus the telephone for public contacts and/or requests especially during the school year. Any un-authorized entry to or exit from the sites should be control as much as possible.

***Site layout and facilities:*** Location of site huts, office accommodation, toilets and welfare facilities should be accommodated within the boundaries of the site.

***Emergency Procedures:*** The Contractor will ensure that emergency procedures are developed to facilitate effective actions in case of medical/fire emergency as well as environmental pollution (major spillage of gasoline, used oil, and/or toxic chemicals, etc.). The emergency procedure will contain emergency phone numbers and the method of notifying the statutory authorities. Contact numbers for the key staff of the contractor will also be included.

***Fire prevention and control:*** All construction sites and associated accommodation or welfare facilities will have in place appropriate plans and management controls to prevent fires. The site

fire plans will be prepared and will have due regard to the GoS regulations. During operation and maintenance of equipment and vehicles, the Contractor will ensure that its workers are well aware of the procedures and have enough knowledge to comply with them. The specification of non-combustible materials, products and packaging will be pursued wherever reasonably practicable. The project will also have to comply with GoS requirements as may be appropriate at specific sites.

**Operation of equipment:** The Contractor must take all reasonable precautions to ensure that equipment is operated in a manner so as not to cause safety risk and/or nuisance to surrounding residents and occupiers. Operations of crane and other large equipment will have to be closely supervised. Permission may be required as per GoS regulations.

**Clearance of the construction site after completion:** On completion of the works the Contractor will clear away and remove all materials and rubbish and temporary works of every kind. The site will be left clean and in a condition to the satisfaction of the PIU and/or delegated agencies.

## **5. Management of Environment and Sanitation**

### ***Nuisance, Dust and Noise Control***

To control nuisance, dust and noise in the construction sites the Contractor should:

- (a) To the extent possible, maintain noise levels associated with all machinery and equipment at or below 90 db.
- (b) In sensitive areas (including residential neighborhoods, hospitals, etc.) more strict measures may need to be implemented to prevent undesirable noise levels. Minimize production of dust and particulate materials at all times, to avoid impacts on surrounding families and businesses, and especially to vulnerable people (children, elders).
- (c) Place dust screens around construction areas, fencing should be provided along the boundary so that the emissions do not affect the immediate neighbors, paying particular attention to areas close to housing, commercial areas, and recreational areas.
- (d) Spray water periodically as needed on construction areas, especially at site located near residential area
- (e) Apply proper measures to minimize disruptions from vibration or noise coming from construction activities.

### ***Disposal of Construction Waste***

The Contractor shall establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

Debris generated due to the demolition of the existing structures shall be suitably reused, to the extent feasible. The disposal of remaining debris shall be carried out only at sites identified and approved by local authorities. The contractor should ensure that these disposal sites: (a) are not located within designated forest areas; (b) do not impact natural drainage courses; Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas. Dispose in authorized areas all of garbage, metals, used oils, and excess material generated during construction, incorporating recycling systems and the separation of materials. In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately

remove such debris and restore the affected area to its original state to the satisfaction of the PIU and/or delegated agencies and local communities.

### ***Water quality***

The Contractor must take all the efforts to prevent wastes (solid and liquid) discharge into all rivers and canals and to protect surface and groundwater from pollution and other adverse impacts including changes to water levels, flows and general water quality. Whenever possible, the Contractor must minimize the amounts of wastewater that need to be discharged and find alternative means of disposal. Liquid spills of lubricant, fuel and oil within the site should be attended at the earliest in order to minimize land & groundwater contamination. The Contractor will ensure that any seepage and wastewater arising from the works must be collected and discharged via a settlement tank. Water drainage must be designed to avoid stagnant conditions that could create bad smell and unsanitary condition in the construction area and surrounding environment.

### ***Workforce and Workers; Sanitation***

The Contractor should whenever possible locally recruit the majority of the workforce and shall provide appropriate training as necessary.

The Contractor shall not allow the use of fuel wood for cooking or heating at the construction site or surrounding area.

The Contractor shall ensure that site offices, depots, and workshops are located in appropriate areas. Clean and well-maintained toilets should be made available.

Clean water shall be adequately provided for workers by the Contractor.

### ***Safety during Construction***

The Contractor's responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all government safety requirements and any other measures necessary to avoid accidents, including the following:

- (a) Notice signs/board shall properly be installed at the construction sites
- (b) If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- (c) Conduct safety training for construction workers prior to beginning work;
- (d) Provide necessary personal protective equipment and clothing (goggles, gloves, respirators, dust masks, hard hats, steel-toed and –shanked boots, etc..) for construction workers and enforce their use;
- (e) During emergencies of any kind, suspend all work.

### ***Community Relations***

To enhance adequate community relations the Contractor shall:

- (a) Inform the local authorities and community about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, as appropriate.

- (b) Limit construction activities at night. When necessary, ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures.

***Physical Cultural Property Chance-finds Procedures***

If the Contractor discovers archeological sites, historical sites, remains and objects the Contractor shall:

- (c) Stop the construction activities in the area of the chance find;
- (d) Delineate the discovered site or area;
- (e) Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the Directorate of Archeology take over;
- (f) Notify the supervisory Engineer who in turn will notify the responsible local authorities immediately (within 24 hours or less);
- (g) Responsible local authorities, would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- (h) Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
- (i) Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities; and
- (j) Construction work could resume only after permission is given from the responsible local authorities concerning safeguard of the heritage.

**Annex-XVIII**  
**Environmental Monitoring Checklist**

## Daily Environment and Social Monitoring Checklist

### Emergency Works KWSSIP

Note: (Provide pictorial evidence against each ESS parameter)

<b>A.</b>	<b>Survey Type</b>
	<ul style="list-style-type: none"> <li>○ First Visit</li> <li>○ Follow up Visit</li> </ul>
<b>B.</b>	<b>Surveyor/ Data Collector Details</b>
	<ul style="list-style-type: none"> <li>○ Supervision Consultant's ESS Team</li> <li>○ Designation:</li> </ul>
	Name of the Surveyors:
	Designation:
	Visit Date/ Time:
<b>C.</b>	<b>Site Details</b>
	Site Location:
	Nature of work: <ul style="list-style-type: none"> <li>○ Leakage Repair Work</li> <li>○ Laying of Sewerage Line</li> <li>○ Laying of Water Supply Line</li> <li>○ Other _____</li> </ul>
2	Site Work Initiated (Date):
	Site Work Target Completed: (Date)
<b>D.</b>	<b>Contractor Details</b>
	Contractor (Name of the Company):
	On Site Contractor's Representative:
	HSE Staff of the Contractor:

S.No.	Description	Status Yes/ No/ Not Applicable (N/A)	Additional Comments
1.	<b>Presence of Environmental &amp; Social Screening Report on the Site</b>		
2.	<b>Environmental Compliance</b>		
2.1	<b>Noise Management</b>  Are measures taken to minimize noise during construction?		
2.2	<b>Air Quality</b>  Are measures taken to minimize dust emissions?		
2.3.	<b>Solid Waste Management</b>		
a.	Is proper waste segregation and disposal being practiced? (provide evidence with pictures)		
b.	Excavated Material Handling  <ul style="list-style-type: none"> <li>○ Used for Backfill</li> <li>○ Remaining Material Disposal (Specify)</li> </ul>		
c.	Provide details for remaining material disposal		
d.	Old Pipes/ New Pipes Storage  <ul style="list-style-type: none"> <li>○ On Site Storage</li> <li>○ Remaining Material Disposal(Specify)</li> </ul>		
3.	<b>Social Compliance</b>		



<b>3.1.</b>	<b>Grievance Redressal Mechanism (GRM)</b>		
<b>a.</b>	Presence of (Not Applicable) <ul style="list-style-type: none"> <li>○ Banner</li> <li>○ Complaint Box</li> <li>○ Complaint Register</li> </ul>		
<b>b.</b>	Are there any community complaints related to the project?  (If yes provide details of the proposed actions to address the complaints and grievances)		
<b>3.2.</b>	<b>Traffic Management</b>		
<b>a.</b>	Is traffic affected due to ongoing construction works		
<b>b.</b>	If Yes, Are alternate routes provided and diversion signs in place?		
<b>3.3.</b>	<b>Presence of Sign Boards</b> <ul style="list-style-type: none"> <li>○ Warning</li> <li>○ Construction</li> <li>○ Other(Specify)</li> </ul>		
<b>3.4.</b>	<b>Occupational Health and Safety (OHS)</b>		
<b>a.</b>	Usage of Personal Protective Equipment (PPEs) <ul style="list-style-type: none"> <li>○ Helmet</li> <li>○ Shoes</li> <li>○ Gloves</li> <li>○ Mask</li> </ul>		
<b>b.</b>	Rating of Usage <ul style="list-style-type: none"> <li>○ Moderate</li> <li>○ Satisfactory</li> </ul>		

	<ul style="list-style-type: none"> <li>○ Unsatisfactory</li> </ul>		
<b>c.</b>	<p>Incident Reporting forms Availability (provide evidence)</p> <ul style="list-style-type: none"> <li>○ Yes</li> <li>○ No</li> </ul>		
<b>d.</b>	<p>Tool Box Talks (provide details of TBTs, name of participants their designation and topics covered)</p> <p>Availability of Records</p>		
<b>e.</b>	<p>If yes, kindly specify the topics covered and details:</p> <ul style="list-style-type: none"> <li>○ Workers' GRM</li> <li>○ Use of PPE</li> <li>○ Community Health and Safety (CHS)</li> <li>○ Covid 19</li> <li>○ Incident Reporting</li> <li>○ SEA/ SH</li> <li>○ Others , Please specify</li> </ul> <p>_____</p>		
<b>3.5.</b>	<b>Community Health and Safety (CHS)</b>		
<b>a.</b>	<p>Provision of Barricades</p> <ul style="list-style-type: none"> <li>○ None</li> <li>○ Soft</li> <li>○ Hard</li> </ul>		
<b>b.</b>	<p>Stakeholder's Consultation (provide documentary evidence, the discussion details and names of the participants)</p>		
<b>c.</b>	<p>Is there any effective communication and consultation with project stakeholders?</p>		

d.	Describe any observed stakeholder engagement efforts and identify areas for improvement (if applicable)		
<b>4.</b>	<b>Gender Compliance</b>		
<b>4.1.</b>	Is contractor Staff sensitized on Sexual Harassment/ Gender based violence?		
<b>4.2.</b>	Is contractor's staff informed where they report in case of Gender based Violence/ Sexual Harassment? Did contractor provide any training or ESS of SC provided any training on that? (provide documentary evidence for that)		
<b>4.3.</b>	Have you observed any child labor onsite?		
<b>5.</b>	Environmental and social action Plan		
<b>5.1</b>	Based on Monitoring findings, outline the actions or measures that are taken to address any noncompliance or concerns and What role ESS of SC played		
<b>5.2</b>	Corrective measures taken (during the visit or in follow up visit)		

**Annex-XIX**  
**Covid-19 SOPs**

# **STANDARD OPERATING PROCEDURES (SOPs) FOR COVID-19**

## **(Based on World Bank Guidelines)**

### **1 Introduction**

The COVID-19 pandemic presents Governments with unprecedented challenges. Addressing COVID-19 related issues in both existing and new operations starts with recognizing that this is not business as usual and that circumstances require a highly adaptive responsive management design to avoid, minimize and manage what may be a rapidly evolving situation. In many cases, reasonable efforts must be put in during the circumstances, recognizing that what may be possible today may be different next week (both positively, because more supplies and guidance may be available, and negatively, because the spread of the virus may have accelerated).

### **2 Challenges with Construction/ Civil Works**

Projects involving construction/ civil works frequently involve a large work force, together with suppliers and supporting functions and services at the designated location. The work force may comprise workers from local areas more specifically. They may need to live in on-site accommodation, lodge within communities close to work sites or return to their homes after work. There may be different contractors permanently present on site, carrying out different activities, each with their own dedicated workers.

Given the complexity and the concentrated number of workers, the potential for the spread of infectious disease in projects involving construction is extremely serious, as are the implications of such a spread. Projects may experience large numbers of the work force becoming ill, which will strain the project's health facilities, have implications for local emergency and health services and may jeopardize the progress of the construction work and the schedule of the project. Such impacts will be exacerbated where a work force is large and/or the project is in remote or under-serviced areas. In such circumstances, relationships with the community can be strained or difficult and conflict can arise, particularly if people feel they are being exposed to disease by the project or are having to compete for scarce resources. The project must also exercise appropriate precautions against introducing the infection to local communities.

### **3 Responsibility/ Planning of the PIU of KWSSIP**

PIU shall ensure that sub projects (i) are taking adequate precautions to prevent or minimize an outbreak of COVID-19, and (ii) have identified what to do in the event of an outbreak.

### **4 Contractor cover**

The Contractor should identify measures to address the COVID-19 situation. What will be possible will depend on the context of the project: the location, existing project resources, availability of supplies, capacity of local emergency/ health services, the extent to which the virus already exist in the area. A systematic approach to planning, recognizing the challenges associated with rapidly changing circumstances, will help the project put in place the best measures possible to address the situation. As discussed above, measures to address COVID-19 may be presented in different ways (as a contingency plan, as an extension of the existing project emergency and preparedness plan or as standalone procedures). PIU and contractor should refer to guidance issued by relevant authorities, both national and international (e.g., WHO).

Addressing COVID-19 at a project site goes beyond occupational health and safety, and is a broader project issue which will require the involvement of different members of a project management team in **Teen Hatti** where project activities will be executed. In many cases, the most effective approach will be to establish procedures to address the issues, and then to ensure that these procedures are implemented systematically. Where appropriate given the project context, a designated team should be established to address COVID-19 issues, including PIU representatives, the Supervising Engineer, management (e.g. the project manager) of the contractor and sub-contractors, security, and medical and OHS professionals. Procedures should be clear and straightforward, improved as necessary, and supervised and monitored by the COVID-19 focal point(s). Procedures should be documented, distributed to all contractors, and discussed at regular meetings to facilitate adaptive management. The issues set out below include a number that represent expected good workplace management but are especially pertinent in preparing the project response to COVID-19.

#### **(a) Assessing Workforce Characteristics**

Many construction sites will have a mix of workers e.g., workers from the local communities specifically; workers from a different part of the country. Workers will be employed under different terms and conditions and be accommodated in different ways. Assessing these different aspects of the workforce will help in identifying appropriate mitigation measures:

- The Contractor should prepare a detailed profile of the project work force, key work activities, schedule for carrying out such activities, different durations of contract and rotations (e.g., 4 weeks on, 4 weeks off).
- This should include a breakdown of workers who reside at home (i.e., workers from the community), workers who lodge within the local community and workers in on-site accommodation. Where possible, it should also identify workers that may be more at risk from COVID-19, those with underlying health issues or who may be otherwise at risk.
- Consideration should be given to ways in which to minimize movement in and out of site. This could include lengthening the term of existing contracts, to avoid workers returning home to affected areas, or returning to site from affected areas.
- Workers accommodated on site should be required to minimize contact with people near the site, and in certain cases be prohibited from leaving the site for the duration of their contract, so that contact with local communities is avoided.
- Consideration should be given to requiring workers lodging in the local community to move to site accommodation (subject to availability) where they would be subject to the same restrictions.
- Workers from local communities, who return home daily, weekly or monthly, will be more difficult to manage. They should be subject to health checks at entry to the site (as set out above) and at some point, circumstances may make it necessary to require them to either use accommodation on site or not to come to work.

#### **(b) Entry/ Exit to the Work Site and Checks on Commencement of Work**

Entry/ exit to the work site should be controlled and documented for both workers and other parties, including support staff and suppliers. Possible measures may include:

Establishing a system for controlling entry/ exit to the site, securing the boundaries of the site, and establishing designating entry/ exit points (if they do not already exist). Entry/ exit to the site should be documented.

- Training security staff on the (enhanced) system that has been put in place for securing the site and controlling entry and exit, the behaviors required of them in enforcing such system and any COVID -19 specific considerations.
- Training staff who will be monitoring entry to the site, providing them with the resources they need to document entry of workers, conducting temperature checks and recording details of any worker that is denied entry.
- Confirming that workers are fit for work before they enter the site or start work. While procedures should already be in place for this, special attention should be paid to workers with underlying health issues or who may be otherwise at risk. Consideration should be given to demobilization of staff with underlying health issues.
- Checking and recording temperatures of workers and other people entering the site or requiring self-reporting prior to or on entering the site.
- Providing daily briefings to workers prior to commencing work, focusing on COVID-19 specific considerations including cough etiquette, hand hygiene and distancing measures, using demonstrations and participatory methods.
- During the daily briefings, reminding workers to self-monitor for possible symptoms (fever, cough) and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell.
- Preventing a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or (if that is not possible) isolating such worker for 14 days.
- Preventing a sick worker from entering the site, referring them to local health facilities if necessary or requiring them to isolate at home for 14 days.

**(c) General Hygiene**

Requirements on general hygiene should be communicated and monitored, to include:

- Training workers and staff on site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular handwashing and social distancing) and what to do if they or other people have symptoms (for further information see WHO COVID-19 advice for the public).
- Placing posters and signs around the site, with images and text in local languages.
- Ensuring handwashing facilities supplied with soap, disposable paper towels and closed waste bins exist at key places throughout site, including at entrances/exits to work areas; where there is a toilet, canteen or food distribution, or provision of drinking water; in worker accommodation; at waste stations; at stores; and in common spaces. Where handwashing facilities do not exist or are not adequate, arrangements should be made to set them up. Alcohol based sanitizer (if available, 60-95% alcohol) can also be used.
- Review worker accommodations, and assess them in light of the requirements set out in IFC/EBRD guidance on Workers' Accommodation: processes and standards, which provides valuable guidance as to good practice for accommodation.
- Setting aside part of worker accommodation for precautionary self-quarantine as well as more formal isolation of staff who may be infected (see paragraph (f)).

#### **(d) Cleaning and Waste Disposal**

Conduct regular and thorough cleaning of all site facilities. Review cleaning protocols for key construction equipment (particularly if it is being operated by different workers). This should include:

- Providing cleaning staff with adequate cleaning equipment, materials and disinfectant.
- Review general cleaning systems, training cleaning staff on appropriate cleaning procedures and appropriate frequency in high use or high-risk areas.
- Where it is anticipated that cleaners will be required to clean areas that have been or are suspected to have been contaminated with COVID-19, providing them with appropriate PPE: gowns or aprons, gloves, eye protection (masks, goggles or face screens) and boots or closed work shoes. If appropriate PPE is not available, cleaners should be provided with best available alternatives.
- Training cleaners in proper hygiene (including handwashing) prior to, during and after conducting cleaning activities; how to safely use PPE (where required); in waste control (including for used PPE and cleaning materials).

#### **(e) Adjusting Work Practices**

Consider changes to work processes and timings to reduce or minimize contact between workers, recognizing that this is likely to impact the project schedule. Such measures could include:

- Decreasing the size of work teams.
- Limiting the number of workers on site at any one time.
- Adapting or redesigning work processes for specific work activities and tasks to enable social distancing, and training workers on these processes.
- Continuing with the usual safety trainings, adding COVID-19 specific considerations. Training should include proper use of normal PPE. While as of the date of this note, general advice is that construction workers do not require COVID-19 specific PPE, this should be kept under review (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- Reviewing work methods to reduce use of construction PPE, in case supplies become scarce or the PPE is needed for medical workers or cleaners. This could include, e.g. trying to reduce the need for dust masks by checking that water sprinkling systems are in good working order and are maintained or reducing the speed limit for haul trucks.
- Arranging (where possible) for work breaks to be taken in outdoor areas within the site.

At some point, it may be necessary to review the overall project schedule, to assess the extent to which it needs to be adjusted (or work stopped completely) to reflect prudent work practices, potential exposure of both workers and the community and availability of supplies, taking into account Government advice and instructions.

#### **(f) Project Medical Services**

- Training medical staff, which should include current WHO advice on COVID-19 and recommendations on the specifics of COVID-19. Where COVID-19 infection is suspected, medical providers on site should follow WHO interim guidance on infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected.



- Training medical staff in testing, if testing is available.
- Assessing the current stock of equipment, supplies and medicines on site, and obtaining additional stock, where required and possible. This could include medical PPE, such as gowns, aprons, medical masks, gloves, and eye protection. Refer to WHO guidance as to what is advised (for further information see WHO interim guidance on rational use of personal protective equipment (PPE) for COVID-19).
- If PPE items are unavailable due to world-wide shortages, medical staff on the project should agree on alternatives and try to procure them. Alternatives that may commonly be found on construction sites include dust masks, construction gloves and eye goggles. While these items are not recommended, they should be used as a last resort if no medical PPE is available.
- Ventilators will not normally be available on work sites, and in any event, intubation should only be conducted by experienced medical staff. If a worker is extremely ill and unable to breathe properly on his or her own, they should be referred immediately to the local hospital (see (g) below).
- Review existing methods for dealing with medical waste, including systems for storage and disposal (for further information see WHO interim guidance on water, sanitation and waste management for COVID-19, and WHO guidance on safe management of wastes from health-care activities).

#### **(g) Local Medical and Other Services**

Given the limited scope of project medical services, the project may need to refer sick workers to local medical services. Preparation for this includes:

- Obtaining information as to the resources and capacity of local medical services (e.g. number of beds, availability of trained staff and essential supplies).
- Conducting preliminary discussions with specific medical facilities, to agree what should be done in the event of ill workers needing to be referred.
- Considering ways in which the project may be able to support local medical services in preparing for members of the community becoming ill, recognizing that the elderly or those with pre-existing medical conditions require additional support to access appropriate treatment if they become ill.
- Clarifying the way in which an ill worker will be transported to the medical facility, and checking availability of such transportation.
- Establishing an agreed protocol for communications with local emergency/medical services.
- Agreeing with the local medical services/specific medical facilities the scope of services to be provided, the procedure for in-take of patients and (where relevant) any costs or payments that may be involved.
- A procedure should also be prepared so that project management knows what to do in the unfortunate event that a worker ill with COVID-19 dies. While normal project procedures will continue to apply, COVID-19 may raise other issues because of the infectious nature of the disease. The project should liaise with the relevant local authorities to coordinate what should be done, including any reporting or other requirements under national law.

## **(h) Instances or Spread of The Virus**

- If a worker has symptoms of COVID-19 (e.g. fever, dry cough, fatigue) the worker should be removed immediately from work activities and isolated on site.
- If testing is available on site, the worker should be tested on site. If a test is not available at site, the worker should be transported to the local health facilities to be tested (if testing is available).
- If the test is positive for COVID-19 or no testing is available, the worker should continue to be isolated. This will either be at the work site or at home. If at home, the worker should be transported to their home in transportation provided by the project.
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, prior to any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and be required to quarantine themselves for 14 days, even if they have no symptoms.
- Family and other close contacts of the worker should be required to quarantine themselves for 14 days, even if they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and worker groups should be isolated from each other as much as possible.
- If workers live at home and has a family member who has a confirmed or suspected case of COVID-19, the worker should quarantine themselves and not be allowed on the project site for 14 days, even if they have no symptoms.

## **(i) Training and Communication with Workers**

- Training of workers should be conducted regularly, as discussed in the sections above, providing workers with a clear understanding of how they are expected to behave and carry out their work duties.
- Training should address issues of discrimination or prejudice if a worker becomes ill and provide an understanding of the trajectory of the virus, where workers return to work.
- Training should cover all issues that would normally be required on the work site, including use of safety procedures, use of construction PPE, occupational health and safety issues, and code of conduct, taking into account that work practices may have been adjusted.
- Communications should be clear, based on fact and designed to be easily understood by workers, for example by displaying posters on handwashing and social distancing, and what to do if a worker displays symptoms.

**Annex- XX**  
**Labor Management Plan**

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## EXECUTIVE SUMMARY

The Government of Sindh (GoS) through the Karachi Water and Sewerage Board (KWSB) intends to receive financial assistance from the World Bank (WB) and Asian Infrastructure Investment Bank (AIIB) for the implementation of the Second Phase of Karachi Water and Sewerage Services Project (KWSSIP-1) (the proposed project). As per World Bank (WB) requirements, the KWSB has prepared these Labor Management Procedures (LMP) to highlight the requirements regarding labor and working conditions which will be applicable to the proposed project.

The document aims to guide the management and control of activities that may pose labor-related risks during the project implementation. The LMP is a mandatory requirement applicable to all types of workers that will be employed by KWSB including its consultants, contractors, sub-contractors, and labor supply contracting agencies, third parties, and all personnel related to the execution of the project.

### 1. Project Overview

KWSB was established in 1981 by promulgating the Sindh Local Government (amendment) Ordinance of February 1983 leading to creation of KWSB within Karachi Metropolitan Corporation (KMC). It is a service-based and consumer-oriented organization responsible for production, transmission and distribution, cost recovery of potable water to the citizen of Karachi, managing sewerage system within the city to ensure hygienic environment, development of scheme to cover short falls in services and collection of revenues for sustained economic viability.

There are four prominent, officially declared, and legal water sources for the city of Karachi. Out of which three sources are surface water sources which include; Lake Haleji, Lake Keenjhar and Hub Dam. Fourth water resource is categorized as groundwater source; the Dumlottee wells. City of Karachi has an allocated quota of 650 Million Gallons per Day (MGD) water from Keenjhar Lake and Hub Dam against a demand of 1,200 MGD. Water is collected and treated by the conventional water treatment plants and distributed by a system which is at least 40-45 years old with some new distribution facilities in the city. Approximately 210 MGD of water is supplied without treatment<sup>1</sup>. River Indus feeds water to the Lake Keenjhar. From Keenjhar, water through conduits goes to Haleji, Gharo, Port Qasim, Steel Mills and to Dhabeji Pumping Station. From Dhabeji Pumping Station, water is pumped to different pumping stations to supply water among all districts of the city by using electrical pumping motors.

There is a huge unmet demand for water (550 MGD current capacity versus an estimated demand of 1200 MGD); a high non-revenue water percentage (50-60 percent); very large financial losses (estimated at Pak Rupees (PKR) 569 million/ United States Dollar (US\$) 5.4 million per month); and significant outstanding arrears (estimated at PRK 32 billion/US\$305 million). Most of KWSB's 1.1 million customers get water through the piped network on an irregular basis, and some just 2-4 hours every other day.

There is currently no sewage treatment, as the city's treatment facilities are dilapidated and not working, resulting in an estimated 475 MGD of sewage being discharged into the Arabian

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<sup>1</sup> *Situational Analysis of Water Resources of Karachi, WWF 2019*

Sea via the storm water network.

In order to address the above-described water supply and sewerage issues in Karachi, following Series of Projects (SOPs) have been conceived under KWSSIP:

- SOP-1 (KWSSIP-1): Focuses on reforms, maintenance and rehabilitation
- SOP-2 (KWSSIP-2): To scale-up investments
- SOP-3: Will focus on increasing water production and financing investments to ensure the additional wastewater created can be treated
- SOP-4: Will focus on improving services in informal settlements based on experience gained under the previous projects

Currently the SOP-1 is under implementation while the SOP-2 is under preparation stage. The SOP1 of KWSSIP has the following three components:

- Component 1- Operational and enabling environment reforms in KWSB
- Component 2- Infrastructure investments
- Component 3 - Project Management and Studies.
- The Component-2 of SOP-1 consists of three (03) investments, for which these labor management procedures have been devised, include the following as listed in Table ES-1:

**Table ES-1: Component-2 of SOP-1, KWSSIP**

Sr. No.	Description	Activity
1	Assignment -A	Rehabilitation of water supply and sewerage in three low-income communities (the Proposed Project)
2	Assignment -B	Priority Water Network Rehabilitation including operation and maintenance (O&M) Equipment, Meters to Reduce NRW
3	Assignment -C	Priority Sewer Network Rehabilitation

The Environmental and Social Assessments for all these projects have been completed, whereas the specific impacts and mechanisms regarding labor commissioned for the project will be discussed in the enclosed report.

## 2. Overview of Labor Use in the Project

The implementation of the Project will involve different categories of workers for different activities associated with the project. Project workers are divided into the following four categories under the WB Environment and Social Standard 2 (ESS2): (i) direct workers; (ii) contractual workers; (iii) primary supply workers; and (iv) community workers. The first three worker categories - contracted workers, primary supplier workers, and direct workers - apply to this project based on this classification and the labor requirements of the project; however their individual numbers are not completely known yet. The project is not envisaged to have community workers.

## 3. Assessment of Key Potential Labor Risks

The main labor risks associated with the project include the following:

- Occupational health and safety (OHS) risks,
- Child and forced labor,
- Labor influx,
- Labor Disputes over Terms and Conditions of Employment,
- Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH),
- Risk from communicable disease,
- Risk from unsafe potable water,
- Lack of provision of basic facilities – water, food, toilets, washing hand facilities, medical aid,
- Unfair recruitment and selection practices which could discriminate against women, vulnerable groups,
- Poor work safety culture, accidents/incidents, lack of provision of personal protective equipment (PPE),
- Salary, wages, and benefits are not in accordance with the labor laws,
- Sub-standard campsite facilities and campsite management,
- Lack of unified rules and regulations for all workers,
- Lack of proper grievance redress channel for workers.

The activities involved in construction and operation work of the project will be primarily responsible for the labor issues as well as health and safety risks that could affect the project's workforce, including Project Implementation Unit (PIU), consultants, and construction workers. The typical labor risks include child and forced labor, influx of workers, working conditions, employment terms and conditions, unfair treatment with the workers, poor working and living conditions, SEA/SH issues, and unavailability of a workers' grievance redress mechanism (GRM). The typical OHS risks include being exposed to the physical dangers of using construction equipment, working near moving traffic, operating cranes, and hoisting equipment, working on or near scaffolding, tripping, and falling, handling bitumen, burns, being exposed to noise and dust, falling objects, traffic risks from operating project-related vehicles, exposure to hazardous materials, and exposure to electrical risks from using tools and machinery. Furthermore, the locations where these works are to happen also pose occupational health and safety hazards as these are highly polluted areas, e.g., wastewater treatment plants, filtration plants.

To reduce the risks to the health and safety of employees, it is crucial to identify hazards and manage associated risks. Additionally, it is projected that taking a proactive approach to risk management will lead to significant cost savings, a decrease in compensation claims, and a reduction in noncompliance with health and safety laws, with overall safer and better working conditions for all involved.

Labor related risks will be minimized by adhering to the mitigation hierarchy, which dictates:

- I. Following all the labor laws and the associated requirements for the working areas, living area, employment conditions, fair treatment of workers and availability of an effective workers' GRM
- II. Hazard Elimination
- III. Substitution of process, substance, or tools

- IV. Prevention of contact with risky object i.e., create barriers, install guards, etc.
- V. Implementation of safe system of work such as permit to work systems, fixing of time limits on hazardous activities performance
- VI. Use of appropriate personal protective equipment (PPE).

To ensure a safe and healthy workplace, the PIU along with its consultants and contractors will take reasonable care to identify all foreseeable labor, health and safety hazards, which hold the potential to harm employees. Hazards may arise from the work process, the equipment and materials in use, the work environment, or other people involved.

The project and all associated workers will follow occupational labor, health and safety regulations. All contractors must include a comprehensive description of their labor, occupational health and safety management strategy with their bids. One of the factors the PIU will consider when choosing the contractors is the applicability of these provisions and their previous track record in doing so. All contractors must make sure that workers use appropriate PPE, get safety training, and take other preventative measures as specified in the WB OHS Guidelines and in a setting that complies with ESS2 criteria. Both the company and the employee are accountable for safety, where they must work together to create and implement an OHS plan as well as safe work practices and procedures.

#### **4. Overview of Labor Legislation**

There are numerous labor regulations in Sindh and Pakistan. These labor laws apply to a wide range of industrial, commercial, and labor institutions and they include a number of ordinances, acts, rules and regulations, and other statutes. Sindh is required to comply with a number of national and international legal obligations in terms of labor rights. The following is a list of the most important legislation pertaining to welfare and labor rights.

- National
  - Pakistan Labor Policy, 2010
  - Factories Act, 1934
  - Industrial Relation Act
  - Workman Compensation Act 1923
  - Minimum Wages Ordinance, 1961
  - Payment of Wages Act 1936
  - Industrial & Commercial Employment Standing Orders Ordinance 1968
  - Maternity Benefits Ordinance 1958
  - Apprenticeship Ordinance 1962
  - Employees Old Age Benefit Act 1976
  - Employments of Children Act 1991
  - Bonded Labor Abolition Act 1992
  - Workers Welfare Act 1971
  - Minimum Wages (unskilled workers), Amendment 2015
  - Disabled Persons (Employment and Rehabilitation) Act 2015
  - Protection Against Harassment of Women at the Workplace Act, 2010
  - Transgender Act 2018

- Provincial
  - Sindh Labor Policy 2018
  - Sindh Workers Compensation Act 2015
  - Sindh Minimum Wages Act 2015
  - Sindh Terms of Employment (Standing Orders) Act , 2015
  - Sindh Payment of Wages Act 2015
  - Sindh Bonded Labor (Abolition) Act 2015
  - The Sindh Prohibition of Employment of Children Act 2017
  - Sindh Occupational Health and Safety Act
  - Protection against Harassment of Women at the Workplace Act (Amendment) 2022
  - Sindh Prohibition of Child Employment Act 2017
  - Sindh Differently Abled Persons (Employment, Rehabilitation and Welfare) Act 2017
  - Sindh Employees' Social Security Act, 2016

In 2010, subjects of labor and employment were devolved to provinces under the 18<sup>th</sup> Amendment to the Constitution of Pakistan, as a result of which the federal labor laws became applicable on provinces under Article 270 AA (6) of the Constitution of Pakistan. The 18<sup>th</sup> Constitutional Amendment in Pakistan has altered the landscape of the labor administration system in the country. Provinces now have a greater responsibility and resources in terms of legislation and implementation. Each province has developed its own labor policy to protect worker's rights. The policy relevant to the KWSSIP project is the Sindh Labor Policy, 2018. This policy incorporates the key thematic areas with primary focus on the effective implementation of labor standards, improvements in workplace safety, living wages, child/bonded labor, awareness raising, excellence in labor inspections regime.

The government of Pakistan has also ratified 36 International Labor Organization (ILO) Conventions, including eight fundamental conventions as of now. In the South Asia region, Pakistan is the second country that has ratified all eight fundamental conventions as enshrined in the ILO Declaration on Fundamental Principles and Rights at Work. The ILO works in close collaboration with its tripartite constituents towards achieving Pakistan's decent work objectives.

The ILO Governing Body has identified eight "fundamental" Conventions, covering subjects that are considered to be fundamental principles and rights at work, which are listed below:

- Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)
- Right to Organize and Collective Bargaining Convention, 1949 (No. 98)
- Forced Labor Convention, 1930 (No. 29) (and its 2014 protocol)
- Abolition of Forced Labor Convention, 1957 (No. 105)
- Minimum Age Convention, 1973 (No. 138)
- Worst Forms of Child Labor Convention, 1999 (No. 182)
- Equal Remuneration Convention, 1951 (No. 100)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111).



The Sindh Occupational Health and Safety Act 2017 is the main applicable local OHS legislation as this Act applies to all Workplaces in Sindh province. The organization needs to formulate OHS Policy which is the requirement of the Act. The contractors and suppliers shall comply with the provisions of the Act.

## 5. Responsible Staff

**KWSSIP / Project Implementation Unit (PIU) Responsibility:** The PIU of KWSSIP is in charge of the overall management of the Project and the LMP's implementation. The LMP must be followed throughout the procurement process. Consultants, contractor(s) and subcontractor(s) must be hired transparently based on their experience and competency.

**Supervision Consultant's Responsibilities:** The supervision consultants will oversee activities of the contractors in their implementation of the designs proposed under the various sub-projects, compliance of civil works with defined guidelines, and implementation of the Environmental and Social Management Plans. Their purview will also include the implementation and supervision of occupational health and safety measures along with labor working conditions.

**Contractors' Responsibilities:** To ensure that all LMP requirements are met, the contractor(s) must appoint Labor and OHS representatives. The contractor must provide the PIU with a monthly report on all incidents and accidents. The contractor is responsible for teaching/training employees how to use personal protective equipment and safety precautions. Contractors must keep records in accordance with the procedures outlined in this LMP. PIU may request records at any time to ensure that labor laws are followed. The PIU will compare records to actuals at least once a month and, if necessary, may order immediate corrective action. The Project staff will continue to have access to the KWSSIP's current grievance procedures. Contractors will be required to set up a grievance redress system for employees that meet the LMP's minimum requirements. Every month, the PIU's social development specialist will go over all related records. Each contractor's site must be manned at all times by a certified safety officer. The contractor must provide any necessary instructions. The contractor's employees will be directed by the safety officer.

## 6. Policies and Procedures

All project staff and contractors must be informed of the project management policies and processes. Contracts must be drafted in conformity with Environmental and Social Standard (ESS) 2 principles and Sindh Labor Laws, and all recruitment processes must be transparent. All signs prepared must be in Sindhi and/or Urdu languages to the greatest extent practicable.

As part of the conformance to labor laws and procedures, the project team will draft the following procedures for implementation:

- Reporting and Investigation of Incidents /Illnesses
- Procedure for Waste Management
- Procedure for Housekeeping
- Procedure for Hazard Identification and Risk Assessment
- Training Procedure including Induction training

- Toolbox Talks
- Safe Systems of Work – work at heights, hot work, electrical High Tension/ Low Tension (HT/LT) works, Excavation, Confined Spaces (Permits to Work)
- Personal Protective Equipment
- Emergency Response Procedure
- Monthly reporting procedure
- Camp management procedure
- Management of Food and Drinking Water at Campsite(s) and at construction site
- Project Site Security Procedure
- COVID 19 measures procedure
- Internal Auditing Procedure
- Management of visits by WB /AIB, Government agencies
- Storage of fuel, hazardous substances
- Operation and maintenance of heavy equipment and overhead cranes
- Child Labor Avoidance Procedures
- SEA/SV Prevention Procedures.

## **7. Age of Employment**

The Sindh Prohibition of Employment of Children Act of 2017 states that any teenage worker (aged between 14 and 18) hired for training at the site(s) must be kept away from technical equipment and not given any heavy tasks.

According to the International Finance Corporation (IFC) Guidance Note 2 and the Sindh Prohibition of Employment of Children Act of 2017, no one under the age of 18 may be hired to work at the project site(s). The hiring process must specify how candidates' Computerized National Identity Cards (CNICs) will be checked, so that no one under the age of 18 can be hired on site. It is necessary to inspect and confirm the applicant's original CNIC.

## **8. Terms and Conditions of Employment**

The employment terms and conditions applying to project employees as set out in the labor rules will apply to all project employees who are assigned to work on the Project (direct workers). Terms and conditions of part time direct workers are determined by their individual contracts. KWSB is committed to providing equal opportunities for all its employees and potential employees where everyone is treated with respect and dignity and where there is equal opportunity for all. The normal hours of work of project workers shall not exceed more than 8 hours a day for 5 days a week, or a 40-hour work week, exclusive of time for meals.

Every project worker is entitled to a 2-day rest day period during weekends (Saturday and Sunday). Workers shall also be entitled to a rest day on regular holidays recognized by the province. Under the Maternity and Benefits Ordinance 1958, leave is granted to pregnant women for a period of 12 weeks with full pay. It is unlawful for an employer to dismiss a woman worker on maternity leave.

Provincial governments constitute Minimum Wages Boards under Section (3) of the Minimum Wages Ordinance, 1961 to decide the wage rates which are revised annually. The workers

welfare legislation includes Employees Old Age Benefits 1976 (with provisions for old age pension, old age grant, invalidity, and widow(er) pension). For contract termination, a notice of one month must be served before severing the employment relationship or payment of one month's wages in lieu of notice may be provided. The law also obliges the employer to provide the termination certificate in writing stating the reason behind it. Any injury, illness or accident sustained by the worker during the work period shall be conveyed to the nearest clinic or hospital by the hiring authority or its representative. Collective bargaining has also been called a fundamental right for the workers to be part of trade unions.

## **9. Workers' Grievance Redress Mechanism**

Pursuant to Article 46 of the Industrial Relations Ordinance (IRO) 2002, a worker may bring his or her grievance in respect of any right guaranteed or secured by or under any law. PIU will establish a GRM (or make provisions in the overall GRM) for the project workers to address labor or workplace-related concerns consistent with the applicable national and provincial laws and ESS2 before the Project Effectiveness. The workers' GRM will be based on the requirements of the WB's ESS2 – Labor and Working Conditions. The environment and social (E&S) specialists of PIU will monitor the recording and settlement of grievances by workers and report to the PIU in its monthly progress reports. The process will be followed by the GRM focal point, the E&S specialists who will be responsible for the GRM of the Project. All concerned responsible staff shall hold regular meetings with the project workers to discuss any work-related issues and concerns. Every grievance raised by a worker will be documented with the actions undertaken by the PIU and contractors to address such grievance.

## **10. Contract Management**

PIU will make sure that the contractors are trustworthy and legal businesses with established labor management practices that adhere to this LMP. A clause requiring contractors to abide by current OHS, labor, and worker protection laws will be included in all contracts with them. PIU will stay updated on how contractors perform in regard to hired help, paying particular attention to how well they adhere to their written contracts.

## **11. Primary Supply Workers**

The construction work under the Project will require the involvement of primary supplies to provide construction materials essential for carrying out the proposed works on rural roads. The PIU and the consultants will review and approve the purchase of primary supplies from the suppliers following such risk identification/assessment. PIU will oversee the procurements of goods and materials requirements under the construction works. Project Contractors will be responsible for procurement and supply of materials and equipment under the same conditions, and specifications on OHS aspects in their contracting agreements. When sourcing for primary suppliers, the project will require such suppliers to identify the risk of child labor/forced labor and serious safety risks. The PIU and the consultants will review and approve the purchase of primary supplies from the suppliers following such risk identification/assessment. Where appropriate, the Project will be required to include specific requirements on child labor/forced labor and work safety issues in all purchase orders and contracts with primary suppliers.

## LIST OF ABBREVIATIONS

AIIB	Asian Infrastructure Investment Bank
BMP	Best Management Practice
CBA	Collective Bargaining Agent
CNIC	Computerized National Identity Card
CoC	Code of Conduct
COVID-19	Corona Virus Disease 2019
DSC	Design and Supervision Consultants
E&S	Environment and social
ECA	Employment of Child Act
EHS	Environmental Health & Safety
EOAB	Employees Old-Age Benefits
ESF	Environmental and Social Framework
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
ESS	Environmental and Social Standard
GBV	Gender-based violence
GoS	Government of Sindh
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HR	Human Resource
IA	Implementing Agency
ILO	International Labour Organization
IRO	Industrial Relations Ordinance
KMC	Karachi Metropolitan Corporation
KWSB	Karachi Water and Sewerage Board
KWSSIP	Karachi Water and Sewerage Services Improvement Project
LMP	Labor Management Procedures
NEBOSH	National Examination Board in Occupational Safety and Health
NFPA	National Fire Protection Association
O&M	Operation and maintenance
OHS	Occupational Health and Safety
OHSMP	OHS Management Plan
PD	Project Director
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SEA	Sexual Exploitation and Abuse
SEPA	Sindh Environmental Protection Agency
SH	Sexual Harassment
SOP	Standard Operating Procedure
SOP	Series of Projects
UN	United Nations

VPP                    Voluntary Protection Program  
WB                    World Bank  
WBG                  World Bank Group

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## 1 INTRODUCTION

The Government of Sindh (GoS) through the Karachi Water and Sewerage Board (KWSB) as the Implementing Agency (IA), intends to receive financial assistance from the World Bank (WB) and Asian Infrastructure Investment Bank (AIIB) for the implementation of the Second Phase of Karachi Water and Sewerage Services Improvement Project (KWSSIP-2) (the proposed project). In compliance with WB requirements, the IA has prepared these Labor Management Procedures (LMP) to discuss the requirements with regard to labor and working conditions applicable to the proposed project. It aims to guide the management and execution of activities that may induce labor related risks during the implementation of the project.

The LMP serves to direct management and control of actions that can bring labor-related hazards while the project is being implemented. The LMP is a requirement that must be met by all employees of the KWSB, as well as all of its consultants, contractors, subcontractors, labor supply contracting agencies, third parties and other staff involved in the project's execution.

### 1.1 LMP Objectives

The objectives of this LMP are to:

- Develop and disseminate labor policies commonly recognized so that participants in the KWSSIP will have a point of reference;
- Ensure that all KWSSIP participants, whether direct workers or not, abide by employment legislation by creating the necessary working circumstances that are compliant with applicable legislative requirements;
- Assist and guide KWSB employees who will work on the project in carrying out labor management procedures;
- Encourage just and equitable labor practices to ensure equal opportunity, non-discrimination, and fair treatment for both male and female employees;
- Create, nurture, and oversee a positive management-employee relationship;
- Protect project workers, especially those who are at risk, such as women and people with disabilities, children (of working age, in accordance with the WB Environmental and Social Standard 2 - ESS2<sup>2</sup>) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate;
- Give project participants and workers easy access to ways to voice their complaints about the workplace.

The LMP's description of the key labor requirements and risks associated with the KWSSIP would help KWSB determine the resources needed to resolve labor difficulties. The LMP is a dynamic document that is initiated early in the planning stage of the project and is evaluated and updated as the project is developed and carried out. As a result, this document defines the types of personnel and their management that the Project is expected to use. Important LMP components will be included in the contractual obligations of contractors and

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<sup>2</sup> World Bank. 2017. "World Bank Environmental and Social Framework." World Bank, Washington, DC

subcontractors. All contractors and subcontractors shall prepare and implement labor management plans in line with the LMP.

KWSB has prepared this document and its annexes based on the existing labor laws in Pakistan and its ratified international agreements, and in accordance with the guidelines of the ESS2 of the World Bank. Furthermore, the scope and procedures of the LMP, its annexes, constitute a special labor framework, against which compliance is mandatory for KWSB and its consultants, contractors, subcontractors, and suppliers associated with this project. The LMP will be applicable to all types of workers that will be employed by KWSB and all personnel employed by the Board in relation to the execution of the project; and therefore, its use and knowledge is mandatory, as necessary.

## **1.2 Scope of the LMP Application**

The LMP is required by the World Bank's Environmental and Social Framework (ESF) and its Environmental and Social Standard-2 (ESS2) on 'Labor and Working Conditions.' Its scope encompasses:

- Labor and contracts;
- Management of workers;
- Occupational Health and Safety; and
- Access of information and grievance mechanisms.

The main objective of ESS2 is to promote constructive worker-management engagement and provide benefits for project development by treating project personnel fairly and giving them safe and healthy working circumstances. The goal of this LMP is to make project planning and execution easier by identifying the major personnel requirements and the environmental and social (E&S) actions needed to manage labor-related project challenges. Along with fundamental guidelines that apply to all forms of work, the LMP also addresses problems and issues unique to the Project. No matter how they were hired or whatever labor policy they fall under, as described below, the LMP is applicable to all workers employed by the Project as specified in ESS2.

- Direct Workers: People employed or engaged directly by the KWSB to work specifically in relation to the Project;
- Contracted Workers: People employed or engaged through third parties to perform work related to core functions of the project, regardless of location;
- Primary Supply Workers: People employed or engaged by the KWSB and its contractors' primary suppliers.

## **1.3 Summary Description of the Project**

### **1.3.1 KWSSIP – Karachi Water and Sewerage Services Improvement Project**

KWSB was established in 1981 by promulgating the Sindh Local Government (amendment) Ordinance of February 1983 leading to creation of KWSB within Karachi Metropolitan Corporation (KMC). It is a service-based and consumer-oriented organization responsible for

production, transmission and distribution, cost recovery of potable water to the citizen of Karachi, managing sewerage system within the city to ensure hygienic environment, development of scheme to cover short falls in services and collection of revenues for sustained economic viability.

There are four prominent, officially declared, and legal water sources for the city of Karachi. Out of which three sources are surface water sources which include; Lake Haleji, Lake Keenjhar and Hub Dam. Fourth water resource is categorized as groundwater source; the Dumlottee wells. City of Karachi has an allocated quota of 650 Million Gallons per Day (MGD) water from Keenjhar Lake and Hub Dam against a demand of 1,200 MGD. Water is collected and treated by the conventional water treatment plants and distributed by a system which is at least 40-45 years old with some new distribution facilities in the city. Approximately 210 MGD of water is supplied without treatment<sup>3</sup>. River Indus feeds water to the Lake Keenjhar. From Keenjhar, water through conduits goes to Haleji, Gharo, Port Qasim, Steel Mills and to Dhabeji Pumping Station. From Dhabeji Pumping Station, water is pumped to different pumping stations to supply water among all districts of the city by using electrical pumping motors.

There is a huge unmet demand for water (550 MGD current capacity versus an estimated demand of 1200 MGD); a high non-revenue water percentage (50-60 percent); very large financial losses (estimated at Pak Rupees (PKR) 569 million/ United States Dollar (US\$) 5.4 million per month); and significant outstanding arrears (estimated at PRK 32 billion/US\$305 million). Most of KWSB's 1.1 million customers get water through the piped network on an irregular basis, and some just 2-4 hours every other day.

There is currently no sewage treatment, as the city's treatment facilities are dilapidated and not working, resulting in an estimated 475 MGD of sewage being discharged into the Arabian Sea via the storm water network.

In order to address the above-described water supply and sewerage issues in Karachi, following Series of Projects (SOPs) have been conceived under KWSSIP:

- SOP-1 (KWSSIP-1): Focuses on reforms, maintenance and rehabilitation
- SOP-2 (KWSSIP-2): To scale-up investments
- SOP-3: Will focus on increasing water production and financing investments to ensure the additional wastewater created can be treated
- SOP-4: Will focus on improving services in informal settlements based on experience gained under the previous projects

Currently the SOP-1 is under implementation while the SOP-2 is under preparation stage.

#### **1.4 Scope of Work under KWSSIP-1**

The components under KWSSIP-1 (or SOP-1) are briefly described below.

##### **SOP -1**

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<sup>3</sup> *Situational Analysis of Water Resources of Karachi, WWF 2019*

The SOP1 of KWSSIP has the following three components:

- Component 1- Operational and enabling environment reforms in KWSB
- Component 2- Infrastructure investments
- Component 3 - Project Management and Studies.

The Component-2 of SOP-1 consists of three (03) investments, for which these labor management procedures have been devised, include the following as listed in **Table 1.1**.

**Table 1.1: Component-2 of SOP-1, KWSSIP**

<b>Sr. No.</b>	<b>Description</b>	<b>Activity</b>
1	Assignment -A	Rehabilitation of water supply and sewerage in three low-income communities (the Proposed Project)
2	Assignment -B	Priority Water Network Rehabilitation including operation and maintenance (O&M) Equipment, Meters to Reduce NRW
3	Assignment -C	Priority Sewer Network Rehabilitation

The Environmental and Social Assessments for all these projects have been completed, whereas the specific impacts and mechanisms regarding labor commissioned for the project will be discussed in the enclosed report.

Brief descriptions of the sub-projects under component-2 of KWSSIP-1 are provided below.

**Assignment – A** includes the rehabilitation of water supply and sewerage in three low-income communities (Katchi Abadis) namely Tekri Village, Essa Nagri/ Welfare Colony, and Sobanagar/ Goharabad.

**Assignment – B** includes the Priority water network rehabilitation including operation and maintenance (O&M) Equipment, meters and district metered areas (DMAs) to reduce non-revenue water (NRW).

**Assignment – C** includes the rehabilitation of Priority Sewer Network of the following four sewerage schemes;

- (i) P1 - Teen Hatti (Liaquatabad)
- (ii) P2 - Karachi Complex (Liaquatabad)
- (iii) P3 - Gulistan-e-Johar & Gulshan e Iqbal
- (iv) P4 - Gulberg Town

## 2 OVERVIEW OF LABOR USE ON THE PROJECT

These Labor Management Procedures apply to all Project workers whether direct, contracted, primary supply and community workers as per ESS-2.

The proposed KWSSIP-1 will involve direct workers (IA employees transferred to the PIU, specialists engaged from the market, etc.); contracted workers engaged in construction work and consultancy services for the project (e.g., for preparation of E&S documents); and primary supply workers (e.g., for equipment required for the project).

The LMP has been developed to manage labor risks during the implementation of the KWSSIP-1. The LMP is in line with national requirements as well as the objectives of the World Bank's ESF, specifically objectives of Environmental and Social Standard 2: Labor and Working Conditions (ESS2).

### 2.1 Labor Requirement

ESS - 2 divides workers into four categories: direct workers, contracted workers, community workers, and primary supply workers that involve all Project workers. At this stage, community workers are not anticipated for KWSSIP. The workers are further categorized as follows:

**1. Direct workers<sup>4</sup>:** Direct employees of the KWSSIP are individuals who are hired by the KWSB to perform work that is explicitly related to the Project. For the purpose of carrying out a variety of project operations, direct workers will include the project-based staff and the permanent staff of the Project Implementation Unit (PIU). The Project Director (PD) will serve as the PIU's leader, and it will consist of multiple senior and junior engineers qualified in civil and engineering. Additionally, the PIU will include experts in financial, procurement, environmental, and social management. As part of the PIU, KWSB may additionally hire consultants and support personnel who will be paid on a contract basis. The national and provincial labor regulations will serve as the basis for these consultants' terms and conditions. The KWSSIP may employ consultants to carry out as many short-term tasks as are required. Any civil officials who are seconded to assist with project implementation must adhere to the occupational health and safety criteria outlined in this LMP.

The PIU will be tasked with:

- General project responsibilities for project management, financial management, procurement, monitoring and evaluation, and environmental and safety management;
- Technical responsibilities to help divisions working on the project; and
- Support services (office manager, assistants, driver, others).

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<sup>4</sup> A "direct worker" is a worker with whom the project has a directly contracted employment relationship and specific control over the work, working conditions, and treatment of the project worker. Where government civil servants are working in connection with the project, whether full-time or part-time, they will remain subject to the terms and conditions of their existing public sector employment agreement or arrangement, unless there has been an effective legal transfer of their employment or engagement to the project.

PIU staff may be transferred from within KWSB, hired or seconded for the implementation of KWSSIP including technical and non-technical staff.

**2. Contracted Workers:** For the purpose of carrying out document preparation and carrying out various civil works under the Project, KWSB will hire a number of contractors and consultants. Contractors, subcontractors, and their employees who are employed by KWSSIP may include consultants who are preparing the feasibility studies and detail design for the project as well as consultants for environmental and social assessment studies. Both expert and unskilled labor will be employed by civil work contractors. Below is a description of the various categories of project contracted employees:

**Permanent / skilled staff of contractors (Construction Company):** Project managers, site engineers, construction foremen, supervisors, environmental, social, health, and safety (ESHS) officers, as well as administrative and financial officers for the project/subprojects will all be involved in the KWSSIP.

**Skilled workers engaged by sub-contractors:** Contractors will mobilize their relevant workers and subcontractors to meet project needs based on the expertise needed for each type of project operations. Welders, fitters, steel workers, electricians, technicians, drivers, and operators of large machinery are just a few examples of the specialized workers. It would be expected of the staff to possess knowledge pertinent to the needed tasks.

**Unskilled community members engaged by the contractor/subcontractors:** To reduce the number of migrant workers at construction sites, local labor will be hired to the extent possible as unskilled and skilled workers, particularly for simple tasks like building ancillary structures, leveling, and excavating land, loading and unloading materials, supporting construction workers, cleaning up construction sites, watering work sites, and watchmen. The contractor will be legally obligated to engage with KWSB /PIU to prioritize the impacted communities and vulnerable groups, including female workers and labors with disabilities at their request, in order to ensure equal chances in employment.

**Project Management and Supervision Support:** Design and Supervision Consultants (DSC) with the necessary experience will be hired by KWSB to perform the following tasks: supporting the PIU in the selection of the contractor(s), developing designs, project management, construction supervision, and contract management. Additionally, DSC will help PIU monitor the contractor(s)' environmental and social performance as outlined in their environmental and social management plans, as well as their adherence to workplace health and safety regulations.

**Independent Monitoring Consultants (or Monitoring and Evaluation (M&E) Consultants):** PIU may hire independent monitoring consultants. Independent monitoring experts are in charge of ensuring adherence to approved project-related plans and programs, including the environmental and social concerns. The independent monitoring consultants may be hired at the start of the implementation phase, and they will finish their job between six and a year after all project activities have been successfully finished.

**3. Community Workers:** The project will not have community workers as defined under ESS2.

**4. Primary Supply Workers:** Skilled and unskilled workers who will be associated with the primary suppliers for the project.

## 2.2 Number of Project Workers

*Direct Workers:* Currently, KWSSIP has approximately 94 direct workers, where this number is expected to increase over time as more projects are introduced and implemented. The staff of the PIU as described in Section 2.1 comprises, among others, the Project Director, several senior and junior engineers, procurement, financial management personnel, and E&S specialists. Direct workers carry out key functions such as project management, coordination, fiduciary, environmental and social management, monitoring and evaluation, and reporting.

*Contracted Workers:* The precise number of project workers who will be contracted is not entirely known right now. Whereas, the number of laborers who will be contracted for civil and other works under this project are given in **Table 2.1**

**Table 2. 1: Estimated number of staff and workforce required during construction phase<sup>5</sup>**

Sr. #	Subproject	Number of Staff
1	<b>Assignment – A:</b> Rehabilitation of water supply and sewerage in three low-income communities (Katchi Abadis) namely Tekri Village, Essa Nagri/ Welfare Colony, and Sobanagar/ Goharabad.	300
2	<b>Assignment – B:</b> Priority water network rehabilitation including operation and maintenance (O&M) Equipment, meters and district metered areas (DMAs) to reduce non-revenue water (NRW).	50
2	<b>Assignment – C:</b> Rehabilitation of Priority Sewer Network of the following four sewerage schemes;  (i) P1 - Teen Hatti (Liaquatabad) (ii) P2 - Karachi Complex (Liaquatabad) (iii) P3 - Gulistan-e-Johar & Gulshan e Iqbal (iv) P4 - Gulberg Town	300

*Construction Works Contractors and Workers:* The number of workers expected to be engaged for the construction works of the project is not known at this stage. However, it is expected that several hundred construction workers will be required for various subprojects under KWSSIP-1.

<sup>5</sup> Numbers taken from PC-I prepared for the subprojects.

## 2.3 Workforce Characteristics

The number of project workers required for the projects falling under the project will be identified by the Project design team in line with PIU. However, given the nature of the project workforce (mostly semiskilled construction labor) and characteristics of the labor force market in Karachi and nearby project area, it is likely the workforce, especially the lower-skilled workers, will be mostly male. The PIU and its consultants are likely to have a number of female workers as well.

There will, however, be females also available in the project areas to join in and contribute to the project. The expectation is that the majority of labor will be locally hired with the exception of a few skilled workers. Provisions will be made to train and hire as many as possible from local communities where the activities will take place. Furthermore, professional business/capacity building companies might be contracted in order to carry out surveys, trainings, and other assessments within the project. The nature of labor force will be skilled workers/experts.

## 2.4 Timing of Labor Requirements

**Direct Workers:** The direct personnel will typically be needed full-time and all year long when the project is being implemented. The yearly construction season can be a little longer or a little shorter depending on the weather. The contractor shall be responsible for organizing the labor force to fit the season and the type of job. Throughout the course of the project, additional experts and consultants will be retained as needed. However, it is apparent that they will be employed in accordance with the implementation of various sub-components for specified time slots. The timing for the engagement of contracted workers will be known at a later point.

**Contracted Worker:** The PIU will hire consultants and contractors who will hire people based on their degree of ability and sub-project requirements based on the scope of work included in KWSSIP-1. When the construction contracts are granted and the contractors produce their work plans, the specifics of the timing of the number of labor requirements, frequency, types of jobs, and length of the requirement will be decided. This LMP may need to be changed at that moment. The maximum number of hours worked per day should be 8, with at least one hour allotted for rest.

**Primary Supply Workers:** The project will need a wide range of equipment, materials and other supplies for which a number of suppliers will be engaged. These suppliers will engage primary supply workers. The primary supply worker provisions of ESS2 apply to those suppliers with whom the project will have a sufficiently significant and ongoing relationship.



### 3 ASSESSMENT OF KEY POTENTIAL LABOR RISKS

The primary risks that project operations pose to workers and other project staff are covered in this chapter.

#### 3.1 Key Potential Labor Risks

The main labor risks associated with the project are assessed to be related to:

- Occupational Health and Safety (OHS) risks,
- Child and forced labor,
- Labor influx,
- Labor Disputes over Terms and Conditions of Employment,
- Sexual Exploitation and Abuse (SEA)/Sexual Harassment (SH)
- Risks from communicable diseases
- Risks from non-potable water
- Unsafe work environments
- Lack of proper grievance redress channel for all workers.

These risks are discussed in the following sections.

#### 3.2 Occupational Health and Safety Risks

The project's construction and operation activities are primarily responsible for the health and safety risks that could affect the project's workforce, including PIU, consultants, construction workers and operation and maintenance (O&M) personnel.

The typical risks include being exposed to the physical dangers of using construction equipment, working near moving traffic, operating cranes, and hoisting equipment, working on or near scaffolding, tripping, and falling, handling bitumen, burns, being exposed to noise and dust, falling objects, traffic risks from operating project-related vehicles, exposure to hazardous materials, and exposure to electrical risks from using tools and machinery. Furthermore, exposure to untreated sewage, risk of disease from vectors drawn to standing water (treated and untreated), risk of flooding, working in confined spaces, and risk of acute poisoning from harmful gases / reagents / chemicals.

To reduce the risks to the health and safety of employees, it is crucial to identify hazards and manage associated risks. Additionally, it is projected that taking a proactive approach to risk management will lead to significant cost savings, a decrease in compensation claims, and a reduction in non-compliance with health and safety laws, with overall safer and better working conditions for all involved.

Labor related risks will be minimized by adhering to the mitigation hierarchy, which dictates:

- Hazard Elimination
- Substitution of process, substance, or tools
- Prevention of contact with risky object i.e., create barriers, install guards, etc.

- Implementation of safe system of work such as permit to work systems, fixing of time limits on hazardous activities performance and
- Use of appropriate personal protective equipment (PPE).

To ensure a safe and healthy workplace, the PIU along with its consultants and contractors will take reasonable care to identify all foreseeable health and safety hazards, which hold the potential to harm employees. Hazards may arise from the work process, the equipment and materials in use, the work environment, or other people involved.

The project and all associated workers will follow occupational health and safety regulations. All contractors must include a comprehensive description of their occupational health and safety management strategy with their bids. One of the factors the PIU will consider when choosing the contractors is the applicability of these safety provisions and their previous track record in doing so. All contractors must make sure that workers wear personal protective equipment (PPE), get safety training, and take other preventative measures as specified in the WB OHS Guidelines and in a setting that complies with ESS-2 criteria. Both the company and the employee are accountable for safety, where they must work together to create and implement an OHS program as well as safe work practices and procedures.

The following **Table 3.1** provides a summary of the major OHS risks related to the project's activities.

**Table 3.1: Key Potential Occupational Hazards/Risks and Control Measures**

Activity	Hazards / Risks Involved	Prevention / Control Measures
Untrained employees at jobs or illegal individuals entering the work area	<ul style="list-style-type: none"> <li>• All the risks listed in this table apply to unskilled people and are therefore relevant to all activities.</li> <li>• Possibility of allowing incompetent staff to engage in a high-risk activity that could harm them or others.</li> </ul>	<ul style="list-style-type: none"> <li>• Only physically fit, qualified, and competent people should be hired.</li> <li>• Make sure that everyone on staff has gone through the induction procedure, which includes orientation and training on the dangers specific to the working site and the tasks to be performed.</li> <li>• All Standard Operating Procedures (SOPs) must specify the necessary training and skills.</li> <li>• Every day before work starts, a Toolbox Talk must be completed.</li> <li>• The work area will only be accessible to those who have completed the risk assessment.</li> <li>• Any access to places where work is to be done must be regulated and only authorized by a responsible employee or contractor.</li> </ul>
Shifting of material at work sites	<ul style="list-style-type: none"> <li>• Ergonomic injuries</li> <li>• Slip, trip and fall</li> </ul>	<ul style="list-style-type: none"> <li>• Create a secure entrance to the worksite.</li> <li>• Avoid inclement weather and only labor during the day, when it is not too hot or raining.</li> <li>• Keep a mobile phone on hand as a backup communication tool and a radio.</li> <li>• Choose the least dangerous route.</li> <li>• Use hard hats with chin straps and non-slip shoes.</li> </ul>

Activity	Hazards / Risks Involved	Prevention / Control Measures
Mobile Equipment Operation	<ul style="list-style-type: none"> <li>Accidents can occur when workers come into contact with vehicles or equipment during the mobilization and use of materials and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>To operate the mobile equipment to be used and to work near mobile equipment to be used, you must have the necessary training and competence.</li> <li>A regular preventative maintenance inspection program is required for all plant, including mobile equipment and supporting infrastructure.</li> <li>The design and installation of guards should follow the relevant machine safety regulations.</li> <li>All unauthorized individuals and non-essential workers must stay outside of the operating area and swing radius of the equipment.</li> <li>Installation of reverse alarms and warning lights in all vehicles and large machinery.</li> <li>Drivers and operators must keep a maintenance log.</li> </ul>
Other activities	<ul style="list-style-type: none"> <li>Working under Adverse Weather Conditions</li> </ul>	<ul style="list-style-type: none"> <li>Other than during emergency restoration operations where the greatest efforts must be taken to prevent any mishaps, the erection or maintenance work shall not be performed during high wind, thunderstorms, or unfavorable weather conditions that would make the work hazardous.</li> </ul>
	<ul style="list-style-type: none"> <li>Risks associated with operation of vehicles (eg, accidents)</li> </ul>	<ul style="list-style-type: none"> <li>For the project, only licensed drivers will be hired.</li> <li>The project drivers will receive training on safe driving techniques. The cars will be kept in good working condition and equipped with all necessary safety features, such as safety belts.</li> </ul>
	<ul style="list-style-type: none"> <li>Improper use of PPE (Personal Protective Equipment)</li> </ul>	<ul style="list-style-type: none"> <li>All times will be spent wearing the proper PPE.</li> <li>Each employee must dress appropriately for the job in order to comply with PPE regulations, reducing or at the very least preventing safety risks and protecting themselves from them.</li> <li>PPE needs to be in good shape.</li> <li>PPE should only be bought from reliable vendors.</li> </ul>
	<ul style="list-style-type: none"> <li>Poor Housekeeping/ Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Facilities for employees must be sufficient, spotless, and well-maintained.</li> <li>Where dangerous products are handled, it should be illegal to smoke, eat, or drink in the workplace.</li> <li>It is crucial to immediately clean up any oil or other liquid spills on the floor because they are a major contributing factor to mishaps.</li> <li>Aisles should be broad enough to safely and comfortably fit both people and vehicles.</li> <li>All tools should be routinely inspected, cleaned, and repaired, and any worn or damaged tools should be removed from service.</li> <li>Each trash can should have a distinct label (e.g., recyclable glass, plastic, scrap metal, etc.)</li> <li>Every storage space needs to be identified.</li> </ul>

Activity	Hazards / Risks Involved	Prevention / Control Measures
	<ul style="list-style-type: none"> <li>• Covid-19 Considerations</li> </ul>	<ul style="list-style-type: none"> <li>• Work tasks will be rearranged, or the number of workers on the job site reduced, to allow for social/physical distancing, or workers will be rotated through a 24-hour schedule.</li> <li>• All workers will receive prevention training to help them avoid the spread of COVID-19.</li> <li>• Communication strategy/plan to support regular communication, accessible updates, and clear messaging to employees about the most up-to-date facts and statistics, as well as applicable procedures.</li> </ul>
Chemical / Fuel	<ul style="list-style-type: none"> <li>• Chemical burns / dermatitis / Skin irritation.</li> <li>• Inhalation / Ingestion &amp; Absorption</li> <li>• Spillage.</li> <li>• Fire</li> </ul>	<ul style="list-style-type: none"> <li>• Development of safe working procedures.</li> <li>• Reduction of number of workers exposed to hazards &amp; duration and frequency of exposure.</li> <li>• Use of personal protective equipment.</li> <li>• Regular environmental and medical monitoring.</li> <li>• Availability of firefighting equipment.</li> <li>• Earth bonding while transferring fuel.</li> <li>• Use of drip trays.</li> <li>• Lined secondary containment, availability of spill containment kit.</li> <li>• MSDS</li> <li>• Chemical &amp; Fuel handling training for workers.</li> </ul>
Fire	<ul style="list-style-type: none"> <li>• Accidental fires due to electrical short circuit.</li> <li>• Burns / Fatality.</li> <li>• Equipment Damage</li> </ul>	<ul style="list-style-type: none"> <li>• Automatic fire detection system and control system should be provided.</li> <li>• Emergency back-up power like D.G. Sets should be provided for the automatic systems.</li> <li>• Matches, cigarettes, etc. should be prohibited.</li> <li>• Soldering, welding or cutting torches should be used after taking hot work permit from the consent authority.</li> <li>• Being a WWTP project, in case of fire treated water reservoir will be used for emergency operation.</li> </ul>
Electrical	<ul style="list-style-type: none"> <li>• Poor electrical installations and faulty electrical appliances.</li> <li>• Contact with live parts causing shock and burns</li> <li>• Short circuits.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure safety of electrical installation and its maintenance.</li> <li>• Provision of safe and suitable equipment.</li> <li>• Provision of safety device.</li> <li>• Carry out preventive maintenance.</li> <li>• LOTO Procedure.</li> <li>• PTW for maintenances.</li> <li>• PPE</li> </ul>
Slips, Trips, and Falls	<ul style="list-style-type: none"> <li>• Personal Injury / Fatality</li> <li>• Poor Housekeeping.</li> <li>• Obstructed access.</li> <li>• Trailing Cables.</li> </ul>	<ul style="list-style-type: none"> <li>• The risk associated with slip and trip hazards can be reduced by avoid spillages in workplace, especially on uneven floors, and trailing cables, and by maintaining good housekeeping. However, for further reduction in the slips and trips, following measures should be followed.</li> </ul>

Activity	Hazards / Risks Involved	Prevention / Control Measures
	<ul style="list-style-type: none"> <li>Poorly constructed work platform.</li> </ul>	<ul style="list-style-type: none"> <li>Safety railing / grills, and safety stairs should be provided.</li> <li>Safety operating procedure should be followed for tank cleaning, pipeline maintenance work at depth or height, chemical handling, and doing regular maintenance work.</li> </ul>
Biological	<p>The workers working in the Wastewater Treatment Plant are prone to following biological hazards:</p> <ul style="list-style-type: none"> <li>Diseases caused by infectious agents present in raw effluent.</li> <li>Diseases caused by insects or rodents proliferating in the sludge drying beds.</li> </ul>	<ul style="list-style-type: none"> <li>Employees shall understand the risks through proper instruction, training and supervision, there will be no any direct contact with chemicals.</li> <li>Provisions and use of suitable personal protective measures.</li> <li>Provision of adequate welfare and sanitation facilities as well as first-aid measures considering the heavy contamination.</li> <li>Provision of separate eating facilities to avoid food poisoning.</li> <li>Effective arrangement for monitoring health of staff.</li> </ul>
Manual Handling	Physical / Back Injuries	<ul style="list-style-type: none"> <li>Use proper lifting tool and tackle having adequate capacity.</li> <li>Only authorized person should operate material handling equipment's.</li> <li>Assess weight of the material, distance to be carried and hazardous etc., before lifting the load.</li> <li>Wear PPE's while handling of materials.</li> <li>Whenever possible, mechanized materials handling shall be adopted.</li> <li>While lifting a load physically, keep the load as near as possible to the body with feet properly placed for body balance.</li> <li>Bend knees, keep back straight, keep the load closed to the body and lift the load.</li> </ul>
Moving Machinery	<ul style="list-style-type: none"> <li>Personal Injury / Fatality / Equipment &amp; Utility Damage</li> <li>Struck by vehicle</li> <li>Blind spot</li> <li>Toppling of the equipment</li> <li>Contact with power transmission</li> </ul>	<ul style="list-style-type: none"> <li>Sloping or benching for excavations deeper shall be designed.</li> <li>Availability of banks man / flag man.</li> <li>Means of access/egress (ladder) required if it is 4 feet deep or more.</li> <li>Spoil dirt must remain at least 1 meter from of the trench/excavation.</li> <li>Trench/ Excavations are to be identified and barricaded.</li> <li>Personnel are not permitted to work in trench excavations where water is accumulating.</li> <li>Fall Protection is required for walkways over deeper than 2 feet.</li> <li>Identification, isolation, protection of underground utilities and structures nearby to be taken care.</li> </ul>

Activity	Hazards / Risks Involved	Prevention / Control Measures
Hot Work	<ul style="list-style-type: none"> <li>• Burn /Personal Injury</li> <li>•Equipment &amp; Utility Damage</li> <li>• Fire &amp; Explosion</li> </ul>	<ul style="list-style-type: none"> <li>• Clearing the area of combustible materials;</li> <li>• Suitable fire extinguishers;</li> <li>• Maintaining a careful watch throughout the work.</li> <li>• A permit to work (PTW) system can help manage the risk on larger projects.</li> <li>• Plant and equipment: select electrical and engine driven plant of suitable capacity to prevent overheating.</li> <li>• Smoking; bring the rules on smoking to the attention of all workers and visitors to the site and enforce them.</li> <li>• Electrical installations: should be of sufficient capacity for the intended use and designed, installed, inspected and maintained by competent people.</li> </ul>
Lifting Operations	<ul style="list-style-type: none"> <li>• Personal Injury / Fatality</li> <li>•Equipment &amp; Utility Damage</li> <li>• Equipment Failure.</li> <li>• Falling objects</li> </ul>	<ul style="list-style-type: none"> <li>• Use of Inspected and certified crane and Lifting gear</li> <li>• Cordon Off Lifting radius.</li> <li>• Competent Crane operator &amp; rigger/ Signaler. Ensure availability of lift Plan &amp; load chart. Ensure ground is stable</li> <li>• Ensure pre-operational check listing of crane. Prohibition on standing / working under suspended load.</li> <li>• Use of Tag line to control load's movement /swing.</li> <li>• Prohibition of lifting operation in windy conditions.</li> </ul>
Confined Spaces	<ul style="list-style-type: none"> <li>• Personal Injury / Fatality</li> <li>• Entrapment, oxygen deficiency, toxic &amp; explosive atmospheres, and asphyxiation.</li> <li>• Heat &amp; humidity.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure working in confined spaces under PTW system.</li> <li>• Effective ERP.</li> <li>• Standby Man</li> <li>• Atmospheric / Gas Testing</li> <li>• Ventilation</li> <li>• illumination</li> </ul>

### 3.3 Child and Forced Labor

People under the age of 18 will not be employed on construction projects that involve hazardous work, except possibly in offices or jobs other than construction. Workers, as part of a contractual requirement, will be required to provide legally recognized documents such as a Computerized National Identity Card (CNIC) to verify their age in order to ensure that no children are hired to work on the project. However, if other labor-related risks emerge during project implementation, the PIU will devise procedures to mitigate the effects. This will include regular community awareness raising sessions to educate residents on the prohibition and negative consequences of child and forced labor.

The above social impact is estimated to be low because: (i) local labor will be prioritized for use in construction activities, while measures to control the age of hired workers will be implemented; (ii) the contractor/subcontractors shall not hire child labor for project-related

jobs, where a commitment not to use child labor is one of the required conditions in the bidding documents; and (iii) workers will be trained on labor safety, traffic safety, and sanitation before beginning work. (iv) Contractor supervision PIU staff will monitor and report the absence of forced labor.

### **3.4 Labor Influx**

The Project's focus will be on localizing economic benefits with limited opportunities for outside workers to service work that requires specialized/skilled labor which is not available in project localities. Due to the availability of local labor supply in the province and the scale of work anticipated under the Project, a large-scale labor influx is not anticipated. Except for a few managers, supervisors, and skilled workers, the majority of workers can be found locally or in nearby areas. The preference for local labor (based on skill and experience capacity) is expected to reduce the risk of labor influx. Specific requirements to manage risks associated with labor influx, such as interactions between project workers and local communities, will be addressed in this document through agreed standards, a Code of Conduct (**Annex I**), and training.

### **3.5 Labor Disputes over Terms and Conditions of Employment**

Labor disputes are unavoidable in a new construction environment. Demand for limited employment opportunities; labor wage rates and payment delays; disagreement over working conditions; and health and safety concerns in the workplace are all likely causes of labor disputes. Furthermore, employers such as contractors/subcontractors may retaliate against workers who demand legitimate working conditions, raise concerns about unsafe or unhealthy working conditions, or raise any grievances, and such situations may lead to labor unrest. However, in order to implement the project policy on fair labor treatment in accordance with ESS2, project contractors/subcontractors will be required to provide their labor with employment information while negotiating with the laborers to reach an agreement on terms and conditions of employment before signing labor contracts. The most efficient mitigating actions to deal with labor disputes during project implementation will be to monitor the implementation of the terms of work conditions that have been agreed upon by both sides and to establish the grievance redress mechanism (GRM) for laborers.

### **3.6 Sexual Exploitation and Abuse (SEA) / Sexual Harassment (SH)**

The new employees and construction workers may develop strong social ties with the local populations outside of their own social circles. This may result in undesirable and/or unlawful behavior, such as unwelcome sexual advances against women and children and SEA/SH. Using the SEA/SH Risk Assessment Tool of the World Bank, this risk has been rated as Moderate for KWSSIP-1. All contractors will be expected to follow the procedures outlined in the World Bank's Procurement Regulations in order to establish a written contract with their employees that are materially consistent with ESS2's goal. A Code of Conduct prepared by the Contractors and authorized by PIU will be required to be signed by all employees and workers.

### 3.7 Summary of Labor Risks and Impacts

The **Table 3.2** below presents a summary of the potential risks and impacts related to labor and working conditions, together with mitigation measures to avoid, eliminate or reduce associated impacts.



**Table 3.2: Risks and Impact Mitigation**

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
Recruitment and selection of workers	Perception of unfair recruitment and selection processes	Community tensions – stop work practices that will affect implementation	Human Resources Policy, including at least: <ul style="list-style-type: none"> <li>• Selection criteria for each position</li> <li>• Equal opportunities for men, women, and transgenders</li> <li>• Method and place of recruitment</li> <li>• Maximize work opportunities for local citizens</li> <li>• Enhance local employee’s skills base through training</li> </ul>	PIU KWSSIP, contractors, and consultants
Conditions of employment (earnings/ benefits)	Perceptions that wages/ salaries and benefits are less for locals relative to outsiders	Work stoppages, protests, absenteeism, sit-ins, sabotage and conflict at the work place	The PIUs policy needs to follow: <ul style="list-style-type: none"> <li>• Contract arrangements and content</li> <li>• Equal pay for equal work</li> <li>• Process for pay increases</li> <li>• Pay scales and increments as well as other benefits</li> </ul>	PIU KWSSIP, contractors, and consultants
Labor relations (conflict handling)	Workers feel aggrieved and do not know how to	Work stoppages, protests, absenteeism, sit-ins, sabotage, and conflict at the workplace	The PIUs policy needs to include the following: <ul style="list-style-type: none"> <li>• Effective grievance redress process which should be gender sensitive</li> </ul>	PIU KWSSIP, contractors, and consultants

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
	communicate their issues		<ul style="list-style-type: none"> <li>• Disciplinary procedures</li> <li>• Workplace rules and regulations</li> <li>• Demobilization procedures</li> <li>• Effective information dissemination to workers</li> </ul>	
Labor communication mechanisms	<ul style="list-style-type: none"> <li>• Workers are not informed about activities or events that affect them</li> <li>• Workers are unable to communicate collective issues plaguing them</li> <li>• Rumors/ misinformation spreading</li> </ul>	<ul style="list-style-type: none"> <li>• Inadvertent actions due to rumors or incorrect perceptions</li> <li>• Poor morale and unproductive work force</li> </ul>	<ul style="list-style-type: none"> <li>• Effective communication mechanisms including: <ul style="list-style-type: none"> <li>• Regular written communication for all workers about the project activities and operations</li> <li>• Worker committees/ organizations/ unions</li> <li>• Use of notice boards/ toolbox</li> </ul> </li> </ul>	PIU KWSSIP, contractors, and consultants
Child Labor	Recruitment of individuals, who by virtue of age, would be exposed to hazardous situations and be subject to impaired social development	Increased health & safety risk to workforce, potential non-compliance with national labor laws, and reputational risk to the project	Human resources and contracting policies covering recruitment and selection processes that specifically address issues associated with child labor	PIU KWSSIP, contractors, and consultants

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
Employment conditions, wages, and benefits	Perceptions that wages, salaries, and benefits are not fair	Work stoppages, protests, absenteeism, sit-ins, sabotage, and conflict at the workplace	<ul style="list-style-type: none"> <li>Human resources policy with respect to equal pay for equal work according to the local conditions and industry averages</li> <li>An effective employee complaints/ grievance process</li> </ul>	PIU KWSSIP, contractors, and consultants
Worker's relations/ interaction with community	<ul style="list-style-type: none"> <li>Disturbing nearby communities due to the worker's routine activities</li> <li>Communities are negatively impacted by some camp activities</li> </ul>	All negative actions on community may cause hindrance in the project construction/ operation as well as other project related activities such as road blockage, community sit ins resulting in prevention of workers, and contractors from entering the project site	<ul style="list-style-type: none"> <li>Implement the control measures to avoid/ and or minimize the impacts of camp and living conditions of workers on communities. Control measures include: <ul style="list-style-type: none"> <li>Encourage to recruit local labor/ staff</li> <li>Limited interaction of outsiders/ foreign workers with the local/ nearby community of the camp</li> <li>Provision of cultural sensitivity awareness training to facilitate appropriate actions interaction with communities</li> <li>Limited movement of workers during the peak working hours of community</li> </ul> </li> </ul>	PIU KWSSIP, contractors, and consultants
SEA/SE aspects	SEA/ SH risks for the communities as well as for workers	-	<ul style="list-style-type: none"> <li>Routes/ places used by women will be avoided as far as possible. If unavoidable, alternate routes will be identified for communities, If required, especially</li> </ul>	PIU KWSSIP, contractors, and consultants

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
			<p>along routes frequented by women such as routes to local water wells</p> <ul style="list-style-type: none"> <li>• Camp sites for construction will be 500 m away from the nearest community</li> <li>• Construction crew will avoid entering villages and settlements</li> <li>• Communities will be informed and consulted before commencing works inside or near the communities</li> <li>• Awareness raising among communities will be carried out for SEA/SH risks</li> <li>• Strict code of conduct will be maintained by the construction crew. Local norms will be respected</li> <li>• Project staff will receive training on the prevention of SEA/SH</li> <li>• Provision related to SEA/SH will be incorporated in the bidding documents</li> <li>• Workers will be required to sign the Code of Conducts prepared by the Contractors which will be reviewed, and approved by PIU</li> <li>• Training and awareness raising will be carried out for the workers on SEA/SH aspects</li> <li>• Identification and mapping of service providers</li> </ul>	

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
Worker Accommodation/ camp specifications	Accommodation is considered sub-standard which leads to discontent amongst the residents and concerns about perceived health risks	<ul style="list-style-type: none"> <li>• Workers have low morale</li> <li>• Perception amongst workers that the project does not care for their welfare, affecting the project</li> </ul>	Build camps to minimum specifications. The following plans will be applied as necessary: <ul style="list-style-type: none"> <li>• Minimum health requirements</li> <li>• Minimum camp specifications</li> <li>• Operations accommodation</li> <li>• Emergency Response Plan</li> <li>• Security Management Plan</li> </ul>	Contractors
Camp Management Practices	Residents do not live in harmony and the potential for conflict arises.  Residents do not know how to make a complaint	-	<ul style="list-style-type: none"> <li>• Implement an induction program to be attended by all residents that covers at least the following:               <ul style="list-style-type: none"> <li>• Camp rules and regulations</li> <li>• Code of conduct</li> <li>• Workers' grievance mechanism</li> <li>• Camp disciplinary procedure</li> <li>• Cultural awareness</li> <li>• Health, safety, and security</li> <li>• First aid kits are adequately stocked</li> <li>• Provision of safe drinking water</li> <li>• Provision of hygienic work and living conditions.</li> </ul> </li> </ul>	Contractors

Category	Worker Impacts/ Risks	Project Impacts/ Risks	Mitigation Measures	Responsibility
Housekeeping	The general appearance of the camp deteriorates making camp life unpleasant	The overall camp experience is compromised which in turn leaves workers demoralized and unproductive.	<ul style="list-style-type: none"> <li>• Ensure that campgrounds and common areas are routinely cleaned and organized with appropriate signage in place</li> <li>• Establish easily accessible, designated smoking areas which are clearly highlighted and regularly cleaned</li> <li>• Ensure that equipment and facilities are kept clean and well maintained</li> </ul>	Contractors
Workers' GRM	Workers may not receive fair treatment from the employers	Demoralized workers Violation of rules and regulations	<ul style="list-style-type: none"> <li>• The project will establish a GRM for its workers</li> </ul>	PIU and contractors

## 4 OVERVIEW OF LABOR LEGISLATION

This chapter presents an overview of the labor legislation in the country relevant to the KWSSIP project, along with relevant World Bank requirements related to workers and working conditions.

### 4.1 Overview

There are a number of labor laws in Pakistan, where most of the labor legislations are based on the inherited legal framework of Britain. Many of the legislations were derived from colonial acts and amendments, which were enacted from 1850 to 1947 and still exist as a part of the country's labor legislation which has been enacted either at the Federal or Provincial level. These labor laws are broad and contain several ordinances, acts, rules and regulations and other statutes relating to industrial, commercial, and labor establishments. These laws compliment the smooth running of the business with regard to matters relating to employers and employees in order to achieve the target of higher productivity, reasonable profits, better wages and reduction in unjust practices or discrimination. Many of these laws pertain to the implementation of the international labor conventions that Pakistan has ratified.

### 4.2 Labor Rights in the Constitution of Pakistan (1973)

The Constitution of Pakistan 1973 provides a framework of rights for labor force and contains provisions for the economic and social well-being of the people and for the promotion of social justice. The Constitution of Pakistan contains a range of provisions with regards to labor rights found in Part II: Fundamental Rights and Principles of Policy. Fundamental rights, such as security of livelihood, prohibition of bonded labor, eradication of slavery, and the right of association have been incorporated in the constitution in Part II. Thus, the constitution affirms the progress of labor legislation, which is conducive to change and to benefit the working class in the following articles:

- Article 11 of the constitution prohibits all forms of slavery, forced labor, and child labor
- Article 17 provides for a fundamental right to exercise the freedom of association and the right to form unions
- Article 18 proscribes the right of its citizens to enter upon any lawful profession or occupation and to conduct any lawful trade or business
- Article 25 lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone
- Article 37(e) makes provision for securing just and humane conditions of work, ensuring that children and women are not employed in vocations unsuitable for their age or sex, and for maternity benefits for women in employment

### **4.3 International Labor Standards Applicable in Pakistan**

Pakistan has various obligations under international law pertaining to labor rights. It is a signatory to the Universal Declaration of Human Rights 1948 which provides the right to work; to free choice of employment in just and favorable conditions of work, and to protect against unemployment. It also includes the right to equal pay for equal work; the right to just and favorable remuneration ensuring an existence worthy of human dignity; and the right to form and join trade unions.

The International Covenant on Economic, Social and Cultural Rights 1966 under Articles 6-8 further articulates these rights by placing obligations on the State to protect the right to work as well as working towards fully realizing the right through provision of fair wages with equal pay for equal work which is sufficient to provide a decent living for themselves and their family; the requirement for safe and healthy working conditions; equal opportunity for promotions; rest, leisure, holidays, limited working hours, etc. It also recognizes the right to join and form trade unions and all acts ancillary to it. The International Covenant on Civil and Political Rights 1966 protects civil rights and the right to join trade unions. All of the above, along with Convention for the Elimination of all Forms of Discrimination Against Women 1979, protect against discrimination, including specific mention of discrimination on the basis of sex. Pakistan is also a signatory to the 1998 Declaration of Fundamental Rights at Work which reaffirms the constitutional principle of the elimination of discrimination in respect of employment and the Protection Against Harassment of Women at the Workplace Act, 2010.

### **4.4 International Labor Organization (ILO) Labor Conventions – Ratifications from Pakistan**

The Government of Pakistan has ratified 36 ILO Conventions, including eight fundamental conventions as of now. In the South Asia region, Pakistan is the second country that has ratified all eight fundamental conventions as enshrined in the ILO Declaration on Fundamental Principles and Rights at Work. The ILO works in close collaboration with its tripartite constituents towards achieving Pakistan's decent work objectives.

The ILO Governing Body has identified eight "fundamental" Conventions, covering subjects that are considered to be fundamental principles and rights at work, which are listed below:

- Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)
- Right to Organize and Collective Bargaining Convention, 1949 (No. 98)
- Forced Labor Convention, 1930 (No. 29) (and its 2014 protocol)
- Abolition of Forced Labor Convention, 1957 (No. 105)
- Minimum Age Convention, 1973 (No. 138)
- Worst Forms of Child Labor Convention, 1999 (No. 182)
- Equal Remuneration Convention, 1951 (No. 100)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)



## 4.5 Federal Labor Laws

Labor legislation in Pakistan traces its origin to colonialism, which has over time evolved through a continuous process of adjusting to the socio-economic conditions, state of industrial development, level of literacy and social welfare. Laws related to labor rights and welfare are listed below:

- Factories Act, 1934
- Industrial Relation Act, 2012
- Workman Compensation Act, 1923
- Minimum Wages Ordinance, 1961
- Payment of Wages Act, 1936
- Industrial & Commercial Employment Standing Orders Ordinance, 1968
- Shops & Establishment Act, 1969
- Maternity Benefit Ordinance, 1958
- Mines Maternity Benefit Act, 1941
- Apprenticeship Ordinance, 1962
- Employees Old Age Benefit Act, 1976
- Prohibition of Employment of Children Act, 1938
- Employments of Children Act, 1991
- Bonded Labor Abolition Act, 1992
- Employees Cost of Living (Relief) Act, 1973
- Companies' Profits (workers participation) Act, 1968
- Workers Welfare Fund Act, 1971
- Minimum Wages (Unskilled Workers) (Amendment) 2015
- Disabled Persons (Employment and Rehabilitation) Act, 2015
- Protection Against Harassment of Women at the Workplace Act, 2010
- Transgender Persons (Protection of Rights) Act, 2018

The most pertinent of these are discussed below.

### 4.5.1 Factories Act, 1934

The Factories Act, 1934 concerns regulation of labor in factories and addresses issues regarding working condition, child labor and working hours for men and women labor, wages, working hours, rest interval, overtime, holiday and health and safety. The Factories Act also briefly refers to environmental issues. Section 14 deals with the disposal of industrial wastewater and states that “effective arrangements shall be made in every factory for the disposal of wastes and effluents due to the manufacturing process carried on therein.” The Factories Act states that “the Provincial Government may make rules prescribing the arrangements to be made under sub-section (1) subject to the approval of such authority as may be prescribed. This allowed the provincial governments to establish Minimum Wages Act, 2015.

#### **4.5.2 Industrial Relations Act, 2012**

The Industrial Relations Act 2012, aimed at regulating the labor-management relations in the country, and allows to bring workers grievance to the attention of his or her employer, in writing, either him or herself, through the shop steward or through his or her trade union within three months of the occurrence of the cause of action. Forms of termination have been described as removed, retrenched, discharged or dismissed from service. To safeguard against abuse of power, victimization or unfair labor practices, the Labor Courts have been given powers to examine and intervene to find out whether there has been a violation of the principles of natural justice and whether any action by the employer was real or unjust.

#### **4.5.3 West Pakistan Maternity Benefits Ordinance, 1958 (The West Pakistan Maternity Benefit Rules, 1961)**

This law is applicable to female workers across the board within all establishments. Female workers are entitled to 12 weeks maternity leave. Every employer is liable for payment of maternity benefits at the rate of her wages last paid during the period of six weeks immediately preceding and including the day on which the female worker delivers a child, and for each day of six weeks succeeding the day.

#### **4.5.4 Industrial and Commercial Employment Act, 2013**

This law governs the industrial relationship between the employer and the workers to maintain industrial peace and settle disputes between them by negotiations, reconciliations, arbitration, and adjudication. This Act establishes and provides procedures for settling grievances and resolving disputes between workers and employers. It also specifies the procedure for lock-outs and strikers and confers upon the right to establish or join trade unions of their own choices.

#### **4.5.5 The Employees Old-Age Benefits Act, 1976**

The Employees Old Age Benefits (EOAB) Act 1976 provides for certain old age benefits for the persons who are employed in industrial, commercial, and other organizations.

#### **4.5.6 Minimum Wages (Unskilled Workers) Act, 2013**

The Government has announced that “the minimum wages would be increased from PKR 12,000 to 13,000 per month (with effect from 1<sup>st</sup> July 2015). Since then, the minimum wages have been reviewed annually. The current minimum wage, as announced in July 2022, was to be PKR 25,000 per month in Sindh.

#### **4.5.7 The Disabled Persons (Employment and Rehabilitation) Act 2015**

The Disabled Persons (Employment and Rehabilitation) Act 2015 provides for the employment, rehabilitation, and welfare and wellbeing of disabled persons.

#### **4.5.8 Employment of Child Act (ECA), 1991**

Article 11(3) of the Constitution of Pakistan prohibits employment of children below the age of 14 years in any factory, mines, or any other hazardous employment. In accordance with this

Article, the Employment of Child Act (ECA) 1991 disallows the child labor in the country. The ECA defines a child to mean a person who has not completed his/ her fourteenth year of age. The ECA states that no child shall be employed or permitted to work in any of the occupation set forth in the ECA (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act are carried out.

#### **4.5.9 Protection Against Harassment of Women at the Workplace Act, 2010**

In 2010, the Pakistan Government passed a Law called “Protection Against Harassment of Women at Workplace, Act 2010”. The Protection against harassment of Women at the Workplace Act 2010 provides legal protection to women against harassment at the workplace, and reforms the existing legislation regarding women’s right to work in Pakistan. It focuses on sexual harassment experienced at the workplace by employees and facilitates the transformation of the work environment, so that it is free of sexual harassment, intimidation, and abuse. The law makes it a special crime to use force against a woman, or even threaten to use force, if the intention is to “disturb her modesty”. It is an offence only when the accused intended or knew it to be likely that the acts in question would lead to an outrage of the victim’s modesty.

#### **4.6 Provincial Labor Laws**

In 2010, subjects of labor and employment were devolved to provinces under the 18<sup>th</sup> Amendment to the Constitution of Pakistan, as a result of which the federal labor laws became applicable on provinces under Article 270 AA (6) of the Constitution of Pakistan. The 18<sup>th</sup> Constitutional Amendment in Pakistan has altered the landscape of the labor administration system in the country. Provinces now have a greater responsibility and resources in terms of legislation and implementation. Each province has developed its own labor policy to protect worker’s rights. The policy relevant to the KWSSIP project is the Sindh Labor Policy, 2018.

This Policy sets out the framework on industrial relations, social and economic wellbeing of the people of the province of Sindh.

After the Eighteenth Amendment, Sindh adopted various laws which comprised of labor laws, welfare and industrial relations laws, where the applicable labor laws are discussed below.

##### **1. Sindh Workers Compensation Act 2015**

This act outlines the details regarding compensation to be paid to workers in case of fatality, loss of hearing, eye sight, limbs during the conduct of work activities. It also outlines the Occupational diseases according to the nature of work and compensation to be paid to the workers in case it proved that the worker suffered from the disease due to workplace exposure.

##### **2. Sindh Minimum Wages Act 2015**

The Sindh Minimum Wages Act 2015 outlines the details with respect to payment of minimum wages to workers of different categories as per gazette notification by the Government of Sindh. The minimum wages to be paid shall be reviewed periodically

and minimum wages notified. Employers are bound to abide by the Minimum Wages Act and pay the wages as notified.

### **3. Sindh Terms of Employment (Standing Orders) Act ,2015**

The Act outlines the classification of workers into:

- i) permanent;
- ii) probationer;
- iii) temporary;
- iv) apprentice;
- v) contract worker.

The terms and conditions of employment shall be provided to the worker in writing, holidays and leave with pay shall be provided. Rules for termination of services are defined in the Act. The Act outlines special provision for construction workers employment and termination at the end of the project.

### **4. Sindh Payment of Wages Act 2015**

The Payment of Wages Act 2015 outlines the responsible person for payment of wages and method of payment of wages to workers. Procedure for fines and deductions is defined. Penalties have been fixed on the employer for non-payment of wages or illegal deductions.

### **5. Sindh Bonded Labor (Abolition) Act 2015**

The Act is gender sensitive, an anti-discrimination clause is added to each new proposed Law in accordance with ILO requirement viz: "No discrimination shall be made on the basis of sex, religion, political affiliation, sect, color, caste, creed, ethnic background in considering and disposing of issues relating to the enforcement of this Act". In all proposed Laws the cognizance has been changed from that of the Judicial Magistrate to the Presiding Officer Labor Courts who is a Session Judge.

This act is applicable as the proposed project may involve the numbers of staff/worker having different religion, political affiliation, sect, color, caste, creed, ethnic background.

### **6. Sindh Prohibition of Employment of Children Act 2017**

The Sindh Prohibition of Employment Act 2017 provides definitions for child and adolescent. A child is a person who is below fourteen years of age and an adolescent is a person who is over fourteen years of age and below eighteen years of age.

The Act outlines that no child labor shall be employed and no adolescent shall be employed to conduct hazardous work as defined in the Schedule.

The Act has fixed penalties in case of employment of child labor. All other labor laws are applicable in case of employment of children.

## **7. Protection against Harassment of Women at the Workplace (Amendment) Act 2022**

The Protection against Harassment of Women at the Workplace Act, 2022 introduced amendments in the previous Act of 2010, and has further broadened its scope. The Act defines harassment as (a) “any unwelcome sexual advance, request for sexual favors, stalking or cyber stalking, or other verbal, visual or written communication or physical conduct of a sexual nature, or sexually demeaning attitudes, including any gestures or expression conveying derogatory connotation causing interference with work performance or creating an intimidating, hostile or offensive work environment, or the attempt to punish the complainant for refusal to comply to such a request or is made a condition for employment”; and (b) “discrimination on the basis of gender which may or may not be sexual in nature, but which may embody discriminatory and prejudicial mind-set or notion, resulting in discriminatory behaviour on basis of gender against the complainant”.

## **8. Sindh Differently Abled Persons (Employment, Rehabilitation, and Welfare) Act, 2017**

The Act provides for the employment, rehabilitation, and welfare of differently able persons. The definition of "differently able" is any persons who on account of injury, disease, or congenital deformity, is challenged for undertaking any gainful profession or employment in order to earn his livelihood and includes a person who is blind, deaf, physically challenged or mentally challenged.

This act is applicable as the proposed project will involve serious occupation health and safety issues during construction phase and may cause serious injury to worker/staff causing permanent disability and differently able

KWSSIP and its contractors are bound to abide by the terms and conditions of the above Acts. No child labor shall be employed at the project site(s). The worker shall be paid compensation as per the Sindh Workers Compensation Act 2015 in case he /she suffers from accident-causing injury during work at the project site(s) involving all Direct, contracted, primary and community workers.

Minimum wages shall be fixed as per the Sindh Minimum Wages Act 2015 (Sindh Act No. VIII of 2016, adopted on 2016-01-25) and any further notifications that may have been issued under the Act. All deductions, benefits shall be in accordance with those defined in the Payment of Wages Act 2015 and terms of Employment (Standing Orders) Act 2015.

### **4.7 The World Bank Environmental & Social Standards (ESS): ESS 2 on Labor and working Conditions**

The World Bank stipulations related to Labor are outlined in its ESS2. The PIU will be required to promote sound worker-management relationships and provide safe and healthy working conditions. Key objectives under ESS2 dictate:

- Promote the fair treatment, non-discrimination and equal opportunity of project workers;
- Secure protection of project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers, and primary supply workers, as appropriate;
- Prevent the use of all forms of forced labor and child labor;
- Support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law;
- Provide project workers with accessible means to raise workplace concerns; and
- Promote safety and health at work.

ESS2 applies to project workers including full time, part time, temporary, seasonal, and migrant workers. Where government civil servants are working in connection with the project, whether full time or part time, they will remain subject to the terms and conditions of their existing public sector employment agreement/ arrangement, unless there has been an effective legal transfer of their employment or engagement to the project. ESS2 will not apply to government civil servants.

Project workers will be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment. The information and documentation will set out their rights under national labor law and ESS requirements (which will include collective agreements), including their rights related to hours of work, wages, overtime, compensation, and benefits. This information will be provided at the beginning of the working relationship and when any material changes occur.

The **Table 4.1** below provides the conformance of the National Labor Act with the key elements of the World Bank ESS 2.

**Table 4.1: Conformance of the Pakistan National Labor Act with Key Elements of ESS2**

<b>Key Elements of ESS2</b>	<b>Provisions in Pakistan Labor Laws</b>
Equal opportunity and non-discrimination	The law contains important provisions prohibiting discrimination based on sex and disability, including equal wages for equal work.
Timely payment	<ul style="list-style-type: none"> <li>• Wages must be paid before the expiry of the 7<sup>th</sup> working day after the last day of the wage period</li> <li>• Where the employment of any person is terminated by or on behalf of the employer, the wages earned by him shall be paid before the expiry of the second working day from the day on which his employment is terminated.</li> </ul>
Minimum wage	The minimum wage as fixed by provinces in each year
Work hours	<ul style="list-style-type: none"> <li>• Under the Factories Act 1934, no adult employee can be required or permitted to work in any establishment in excess of nine hours a day and 48 hours a week</li> <li>• Section 8 of the West Pakistan Shops and Establishments Ordinance, 1969 likewise, restricts weekly work hours at 48 hours that includes rest and prayer times</li> </ul>

<b>Key Elements of ESS2</b>	<b>Provisions in Pakistan Labor Laws</b>
Worker rights	Regular leaves and benefits. The employer must provide reasons for termination.
Prevents use of all forms of forced and child labor	The national and provincial labor laws prohibit use of all forms of forced labor and child labor.
Protection of workers	The labor laws encompass a large array of rights to protect workers including the right to decent work and freedom of association to equal opportunity and protection against discrimination. Specific rights related to the workplace include health and safety in the workplace and the right to privacy at work, amongst many others.
Occupational Health and Safety	This law provides for comprehensive OHS and empowers the Department of Labor to conduct inspections of establishments and to impose penalties for violations of non-compliance.
Working Age of Workers	Under the Factories act 1934, no child who has not completed his fourteenth year shall be allowed to work in any factory.
Women	Under the Ordinance of 1958, women with at least four months employment in an establishment immediately preceding the day of delivery are eligible to get a total of twelve weeks of maternity leave, six weeks before and six weeks after the childbirth.
Persons with Disabilities (PWD)	Persons with Disabilities Rights and Protection Act 2013 provides for rights to discrimination free employment opportunities
Migrant Workers	No special provisions for migrant workers
Contract Workers	In the case where the wages of a worker employed by a contractor are not paid by the contractor, the wages must be paid by the employer of the establishment.
Community Workers	The labor law does not recognize community workers as defined in the ESS2 and hence does not provide any special consideration for such contracting arrangements. The law requires that all labor supply contracting agency will have to be formally registered, and workers should first be the responsibility of the contracting agency.
Primary Supply Workers	The law does not assign any responsibility to the project on the supplier's laborers and their working conditions. Workers of suppliers will have to be the responsibility of the suppliers.
Freedom of Association and collective bargaining	Article 17 of the Constitution not only guarantees freedom of association but also collective bargaining as a fundamental right. Keeping in view this provision, labor law in Pakistan allows formation and joining of trade unions/ associations to both the employers and the employees.
Access to a grievance redress mechanism	Workers can seek direct civil law redress from the Labor courts for complaints regarding terms and conditions employment and wages, health and safety, maternity welfare, and child labor offences are subject to criminal prosecution.

The **Table 4.2** below, on the other hand, describes the main gaps of the government system with respect to the WB ESF Standards:

**Table 4.2: Main Gaps of Government System with respect to WB ESF Standards**

<b>WB ES Standard</b>	<b>Legislation</b>	<b>Gaps</b>
ESS2: Labor and Working Conditions	Factories Act 1934 Pakistan Occupational Health & Safety Act 2018	Working Conditions: <ul style="list-style-type: none"> <li>• The Act does not specifically require that development be assessed and reviewed in terms of labor and working conditions including OHS requirements before approval.</li> <li>• The Labor Act does not require development projects to prepare Labor Management Procedures/ Plans or OHS plans.</li> <li>• The Labor Act prohibits the use of child labor, however, it does not stipulate what age constitutes a child. The Child Labor (Prohibition and Regulation) Act 2000 prohibits the employment of any child below the age of 14 while children between the ages of 14 and 16 are allowed to work.</li> </ul>
ESS4: Community Health & Safety		Covered under ESIA but the systems do not provide clear requirements for the development project and implementation.



## **5 BRIEF OVERVIEW OF LABOR LEGISLATION: OCCUPATIONAL HEALTH AND SAFETY**

This chapter discusses the legislation for OHS aspects in the country. Also discussed in the chapter are the WB guidelines on these aspects.

### **5.1 Occupational Health and Safety (OHS)**

The project will observe and ensure the protection against OHS risks to the workers embodied in various international laws, national, and provincial laws and administrative issuances governing the public sector. Observing and enforcing OHS protection should aim at: the promotion and maintenance of the highest degree of physical, mental, and social wellbeing of workers in all occupations; the prevention amongst workers of departures from health and safety caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; and placing and maintenance of the workers in an occupational environment adapted to his/her physiological and psychological capabilities.

### **5.2 International Conventions**

#### **5.2.1 ILO Conventions**

ILO has formulated more than forty regulations, particularly concerning with the OHS issues. It has several major regulations as follows:

#### **1. ILO Technical Convention: C187 – Promotional Framework for Occupational Safety and Health Convention.**

This Convention stresses:

- i. A safe and healthy working environment by formulating a national policy
- ii. Each member shall promote and advance, at all relevant levels, the right of workers to a safe and healthy working environment
- iii. In formulating its national policy, each Member, in light of national conditions and practice in consultation with the most representative organizations of employers and workers, shall promote basic principles such as assessing occupational risks or hazards; combatting occupational risks or hazards at source; and developing a national preventative safety and health culture that includes information, consultation and training.

#### **2. Prevention of Major Industrial Accidents Convention, 1993 (No. 174)**

The purpose of this convention is the prevention of major accidents involving hazardous substances and the limitation of the consequences of such accidents. The convention protects workers, the public, and the environment by preventing major accidents either on or off site and provides guidance on appropriate emergency planning.

### **3. Safety and Health in Construction (1992)**

The objective of this code is to provide practical guidance on a legal, administrative, technical and educational framework for safety and health in construction with a view to: preventing accidents and diseases and harmful effects on the health of workers arising from employment in construction: ensuring appropriate design and implementation of construction projects: providing means of analyzing from the point of view of safety, health and working conditions, construction processes, activities, technologies and operations, and of taking appropriate measures of planning, control and enforcement.

### **4. Safety and Health in Building and Civil Engineering Works (1972)**

Code of practice relating to occupational safety and occupational health in civil engineering and the construction industry, includes provisions concerning the work environment and equipment, fire protection, noise, machinery (including building machinery and electrical machinery, ionizing radiations, explosives, handling, occupational health, welfare, and healthcare services).

This code of practice covers 42 topics related to safety and health in building and civil engineering. The Main topics include workplaces and equipment, scaffolds, ladders and stairs, lifting appliances; railways, road and similar transport; construction equipment; electricity, blasting, concrete work, other building operations, excavations, underground construction, work in compressed atmosphere, work clothes, and personal protective equipment; hygiene and welfare; medical supervision.

#### **5.2.2 United Nations and Group 20 Countries**

The United Nations has adopted 17 Sustainable Development Goals with specific target on OSH. Similarly, the G20 summit placed OSH on the agenda.

### **5.3 Provincial Legislation on OHS**

The **Occupational Health and Safety Act 2017** is the applicable local legislation as this Act applies to all Workplaces. Details of each chapter are described below:

Chapter I identifies the duties of the employer as follows:

1. Undertake practical measures for Safety & Health and Welfare;
2. Identify, assess and address existing & new hazards;
3. Report and investigate incidents;
4. Provide and apply Safe Systems of Work, Safe tools & equipment & appliances
5. Safe use, handling, storage, disposal and transport of materials and substances;
6. Control physical, chemical, biological, ergonomic, psychosocial or other hazards, affecting workers and others;
7. Provide Information, Instruction and Training to ensure Safety & Health at Work;
8. Maintain workplace in safe, clean, orderly and risk-free condition with safe means of access;

9. Inform workers regarding work hazards, risks involved and preventive and protective measures;
10. Provide adequate PPE to prevent risk from injury and ill health;
11. Maintain records of all accidents at workplace;
12. Provide first aid arrangements and emergency provisions;
13. Take measures to prevent fires & measures in the event of fire; and
14. Collaborate in the case of simultaneous operations or joint premises

The duties of workers and volunteers are identified as follows:

1. Ensure safety & health of others who may be affected by his acts & omissions & not willfully do anything to endanger himself or others;
2. Use & take care of PPE provided by the employer;
3. Do not willfully interfere or misuse any appliance or equipment or convenience provided for safety & health of persons at workplace;
4. Resolve any situation being unsafe posing immediate threat with the employer or cease work until the dispute is resolved
5. Until the dispute is resolved, employer may assign the affected workers some temporary alternative work; and
6. Worker shall report any occupational accident, occupational Disease, dangerous occurrences, or commuting accident as per company OSH Policy.

The general duties of suppliers have been identified below:

1. Design & construction to be safe & without risk to safety & health;
2. Testing & examination;
3. Adequate information;
4. Substance to be safe & without risk; and
5. Includes supply, handling, assembling, installing, erecting & testing of tools, machinery & equipment

Chapter II states rules that that Government has made for the safety and health of workers in any establishment by notification in official gazette.

The rules include the following matters:

1. Cleanliness and maintenance of building;
2. Illumination, ventilation, temperature, noise, dust, fumes and artificial ventilation;
3. Disposal of wastes and effluents;
4. Floors, stairs, mean of access, proper working space, overcrowding, pits, sumps, opening in floors, and allied things;
5. Drinking water and conservancy;
6. Guarding and fencing of machinery at work and work at, on or near moving machinery;
7. Self-acting machines and device for cutting off power; revolving machinery and pressure plants;
8. Instruction, training and supervision in relation to employment on dangerous machines and fencing or casing of machinery, wet floors, open wiring, safety fitting etc.;

9. Explosives or inflammable dust, gas and precautions against dangerous fumes etc.;
10. Precaution in case of fire;
11. Personal protective equipment;
12. Excessive weights;
13. Loading and earth moving machinery;
14. Cranes, hoists, lifts and other lifting operations;
15. Scaffolding and work at heights; and
16. Safety of building, machinery and manufacturing process

Whereas, The Sindh Occupational Health & Safety Act calls for:

1. Written Statement of Policy;
2. Consultation – formation of OHS Committee with worker representation; appointment of OHS officer;
3. Training of Health & Safety Representative;
4. Precautions against Contagious & Infectious Disease at Workplace; and
5. Compulsory Vaccination and Inoculation.

Chapter III details enforcement measures and requires:

- Registration of workplaces and approval of site, buildings and other constructions to be used as workplaces; and
- Notification and investigation of accidents, dangerous occurrences and occupational illnesses.

Chapter IV details the formation of Occupational Health and Safety Council headed by the Secretary Labor having members from industry, representatives from employers, representatives of workers, professionals, members from civil society and member from the Labor Directorate.

The Act has also fixed penalties and offences in case of non-compliance with the provisions of the Act. The maximum penalty for non-compliance is Rs.250,000/-

The Sindh Occupational Health & Safety Rules 2019 outline the measures to be undertaken to implement the requirements of the Sindh OSH Act 2017.

The organization needs to formulate OHS Policy which is the requirement of the Act. The contractors and suppliers shall comply with the provisions of the Act.

#### **5.4 The Labor Policy 2010 – Government of Pakistan**

The Labor Policy 2010 addresses the importance of OHS legislation in Pakistan as provided below:

- Labor laws relating to occupational health and safety will be consolidated and rationalized to avoid overlapping and inconsistencies;
- Government shall enact suitable legislation to ensure health and safety of construction workers; and
- A Tripartite council on Health & Safety has been set up to identify health and safety hazards for workers of all economic sectors and to make recommendations for safety measures on a continuous basis.

## 5.5 WBG EHS Guidelines

The World Bank Group (WBG) has guidelines for Environment, Health, & Safety (EHS) that serve as useful references for general issues as well as sector specific activities. Projects financed by the WBG are expected to comply with this guideline as required by the policies and the standards. The EHS Guidelines are mainly on occupational health and safety, community health and safety as well as on construction and decommissioning. It contains guidelines cross cutting on environmental (waste management, ambient air quality, noise, and water pollution), occupational health and safety issues amongst others, applicable to all the industry sectors<sup>6</sup>.

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<sup>6</sup> [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/sustainability-at-ifc/policies-standards/ehs-guidelines](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines)

## 6 RESPONSIBLE STAFF

### 6.1 KWSSIP / PIU Responsibility

The overall management of the Project is the responsibility of the PIU of KWSSIP. PIU will oversee the LMP's implementation. The LMP must be followed in all aspects of the procurement process. Contractor(s) and subcontractor(s) shall be hired in a transparent manner based on their experience and competency. The contractor(s) must ensure that all LMP requirements for labor (direct and contracted), protection, and facilities are met, and this must be included in the written agreement.

As follows, the E&S team at PIU will implement and monitor the provision of this LMP:

- Ensure that the workers are recruited, retained and treated in accordance with the E&S regulations, including the LMP and OHS provisions;
- Confirm that the duties owed to the direct workforce are carried out as outlined in this LMP and contractual documents;
- Track the project workers' training;
- When conducting activities, keep an eye out for any potential dangers of significant safety issues;
- Create and put into action a grievance procedure for direct employees that include tracking the progress of complaints and their outcomes as well as ensuring that complaints received from employees are quickly addressed.
- Ascertain that the project's workers are aware of the grievance procedure;
- Keep records of the hiring process, including age and gender verification, as well as the hiring of the hired staff. Orient new hires to environmental, social, and occupational health and safety issues and provide ongoing training for these personnel.
- Report any incidents or accidents involving project personnel and information about labor and occupational health and safety performance to the World Bank.

### 6.2 Contractors' Responsibilities

**Occupational Health and Safety:** To guarantee adherence to every LMP requirement, the contractor(s) must appoint OHS representative(s). Every month, the contractor must give the PIU a report on all incidences. The contractor is responsible for making ensuring that employees are taught in using personal protective equipment and safety precautions.

Immediately notifying the PIU of serious situations is required. Regular meetings between the PIU of KWSSIP and the contractor(s) will be held to assess progress and make sure that the OHS requirements of the LMP have been met. Follow-up on the action plans developed for the accidents that happened on specific sites. When executing the safety measures in the LMP, any challenges must be addressed by the contractor.

**Labor and Working Conditions:** Contractors shall maintain records in compliance with the procedures set forth in this LMP. PIU may at any point request records in order to verify that labor rules are being observed. The PIU will compare records to actuals at least once every month and, if required, may mandate rapid corrective action. A summary of issues and solutions will be delivered in quarterly reports to the World Bank.

**Worker Grievances:** KWSSIP's current grievance procedures will still be available to the Project staff; however, contractors will be required to establish a separate grievance redress system for employees that satisfy the minimum requirements of this LMP. The PIU's social development specialist will review all records on a monthly basis. In instances where workers' complaints are not resolved by the national/provincial system, the PIU will nonetheless remain informed of decisions and reflect in quarterly reports to the World Bank.

**Additional Training:** Each contractor is required to, at all times, have a qualified safety officer on board. If training is required, this will be the contractor's responsibility. The safety officer will provide instructions to contractor staff. PIU will also arrange training to address risks associated with labor influx and will also provide a schedule for training required. The contractor will be obligated to make staff available for this training, as well as any additional mandatory trainings required by PIU, as specified by the contract.

The staff will receive training on the prevention of SEA/SH, codes of conduct, as well as on gender and GBV in general. The PIU will be responsible for (i) training, (ii) implementation, and (iii) supervision of OHS aspects.

It will be a condition in the construction contracts that the contractors give preference to local labor. This entails that wherever possible, unskilled work opportunities should be made available to community members.

## 7 POLICIES AND PROCEDURES

All project staff and contractors must be informed of the project management policies and processes (s). Contracts must be drafted in conformity with ESS 2 principles and Sindh Labor Laws, and all recruitment processes must be open. Copies must be in Sindhi or Urdu to the greatest extent practicable. Urdu and Sindhi must be used for training sessions and procedure writing. The project team will prepare the subsequent actions as given in this Section. PIU will include the suggested measure in the bidding documents as provided in the **Annex II**.

### 7.1 Labor Policies and Procedures

These policies and procedures will be updated and modified, if necessary, after the allocation of the contracts of the different positions of the PIU. As specified in the national labor laws, the employment of project workers will be based on the principles of non-discrimination and equal opportunities. There will be no discrimination with respect to any aspects of the employment relationship, including recruitment, compensation, working conditions and terms of employment, access to training, promotion, or termination of employment. The following measures will be followed by contractors and monitored by the PIU with support from Human Resource Department to ensure fair treatment of all employees:

- Recruitment procedures will be transparent, public, non-discriminatory, and open with respect to ethnicity, religion, sexual orientation, disability or gender
- Applications for employment will only be considered if submitted via the official application procedures established by contractors
- Clear job descriptions will be provided in advance of recruitment and will explain the skills required for each post
- All workers will have written contracts describing terms and conditions of work and will have the contents explained to them, after which the workers will sign the contract.
- Unskilled labor will be preferentially recruited from the surrounding communities, and settlements.
- Employees will be informed at least two months before their expected release date of the coming termination.
- The contracted workers will not be required to pay any hiring fees. If any hiring fees are to be incurred, these will be paid by the Employer.
- Depending on the origin of the employer and the employee, employment terms and conditions will be communicated in two languages, in the national language and the language that is understandable to both parties
- In addition to the written documentation, an oral explanation of conditions and terms of employment will be provided to workers who may have difficulty understanding the documentation.
- It is noted that language related problems are not expected, but if they are, interpretation will be provided for workers as necessary.
- All workers will be 18 years old or above for civil works. This will be a requirement in contracts with construction works contractors.
- Normal working time should not exceed 40 hours per week. With a five day working week, the duration of daily work is limited by the internal work regulations approved by



the employer after prior consultation with the representatives of the workers, in compliance with the established working week duration.

The PIU will inform the World Bank of any significant event (social issues) as soon as possible, but no later than five working days, after the occurrence of the event. Such events include strikes or other workers' demonstrations. The PIU will prepare a report on the event and the corrective measures and subsequently submit it to the World Bank within 30 days of the event.

## **7.2 Occupational Health and Safety**

The KWSSIP PIU is committed to comply with the legislation that relates to the occupational health and safety requirements as stipulated in the main law governing OHS and Sindh Factories Act 2015 Chapter 3 in Sindh as well as other provincial and federal OHS Acts. The Sindh Hazardous Substance Rules of 2014 regulate certain occupations as hazardous and contain special provisions to regulate the working conditions in those occupations. In addition, there are other laws to be complied with dealing with OHS including The Mines Act 1923; Social Security Ordinance 1965; Workmen's Compensation Act 1923; Shop and Establishment Ordinance 1969 and Dock Laborer Act 1934 as well as WB ESS2 and ESS 4. These laws and standards will enable OHS hazards identification and risk elimination through promotion of appropriate skills, knowledge and attitudes towards hazards.

The PIU will have a designated Occupational and Community Health and Safety Specialist and an Environmental Representative for an agreed period. This specialist must have a minimum bachelor's degree in civil/environmental engineering/environmental sciences and certificate course in OHS (e.g., The National Examination Board in Occupational Safety and Health - NEBOSH) with a minimum of 5 years of experience as OHS professional in construction of infrastructure projects. Extensive knowledge of all OHS legislation, OHS guidelines and standards are required.

It is important that all staff must be given induction training so that they are aware of the hazards specific to the project and its activities. This is in addition to toolbox talks and other training needs identified during project implementation.

The PIU will ensure that all workers irrespective of any category should be provided with appropriate type of protective masks, helmet, overall and safety shoes, and safety goggles, protective clothing as well as other appropriate PPE as per work job hazard analysis and method statements (such as working on live wires). The PIU and contractors must also ensure appropriate demarcation of workplace and notices for hazardous area where applicable; accident reporting, notification and investigation practices at each workplace required; safety sign and symbols displayed at workplace and ensure availability of first aid box; also identify and service agreement done with specialized hospitals for complicated accidental and health problems as well as specific details will be included in the emergency management plan (see **Annexes III, IV and V**).

### **Occupational Health and Safety Management Plans (OHSMP)**

Contractors will be required to prepare OHSMP in accordance with OHS standards mentioned in the bidding documents, OHS provisions of ESMP, compliance with the local regulatory

requirements, and World Bank EHS Guidelines. All OHSMPs shall have a minimum requirement to include information and details on:

- Reporting and Investigation of Incidents /Illnesses
- Procedure for Waste Management
- Procedure for Housekeeping
- Procedure for Hazard Identification and Risk Assessment
- Training Procedure including Induction training
- Toolbox Talks
- Safe Systems of Work – work at heights, hot work, electrical HT/LT works, Excavation, Confined Spaces (Permits to Work)
- Personal Protective Equipment
- Emergency Response Procedure
- Monthly reporting procedure
- Camp management procedure
- Management of Food and Drinking Water at Campsite(s) and at construction site
- Project Site Security Procedure
- COVID 19 measures procedure
- Internal Auditing Procedure
- Management of visits by WB /AIIB, Government agencies
- Storage of fuel, hazardous substances
- Operation and maintenance of heavy equipment and overhead cranes.
- Recruitment procedures will be transparent, public, and non-discriminatory, and open with respect to ethnicity, religion, sexuality, disability, or gender.

The Guideline for Policies and Procedures are appended in **Annex VI**.

### **7.3 Child Labor and Forced Labor**

To prevent engagement of underage workers, the age employment scheme should be strictly adhered to by parties involved in hiring. The process of hiring Direct Workers should include a proper screening, with age verification to ensure no children are employed in the implementation of the project. Likewise, all contracts must have a provision as to the minimum age requirement and the hiring authority shall keep a registry of all hired workers.

### **7.4 Labor Influx/ SEA/SH**

All project workers will undergo relevant seminars and training to prevent risks of labor influx including SEA/SH issues. Project workers particularly those coming from other communities will be briefed on the culture and history of the area, allowing them to adapt to the community values and to avoid any conflicts due to the dissimilarities of their cultural backgrounds.

#### **Discrimination and exclusion of vulnerable groups**

The employment of project workers will be based on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment

relationship, such as recruitment and hiring, terms of employment (including wages and benefits), termination and access to training. This project shall comply with the national labor laws on gender equality in the workplace, which will include provision of maternity leave and nursing breaks and sufficient and suitable toilet and washing facilities, separate for men and women workers.

### **Development of a SEA/SH Action Plan and Mitigation Measures for Risks Related to Gender**

According to the Note on Good practices to combat SEA/SH in the Framework of Financing Investment Projects involving major civil engineering works, all projects, whatever their risk level, should guarantee the minimum actions recommendations for addressing the risks of SEA/SH related issues.

The initial SEA/SH mitigation measures have been included in the ESIA's and ESMPs of the project. A separate GBV Action plan will be prepared, where additional measures may need to be included.

### **7.5 Labor Disputes over Terms & Conditions of Employment**

Fair, reasonable, and lawful terms and conditions shall be applied in the contractual provisions of all project workers to prevent labor disputes. Moreover, there will be an efficient grievance mechanism to address any issues that may arise during existence of the contract. The guidelines provided later in the document shall be strictly observed to avoid disputes over terms and conditions of employment.

All the contractors who will be engaged for the project will be required to produce their grievance procedure as a requirement for tender, which at a minimum comply with these requirements. In addition, good international practice recommends that the procedure be transparent, confidential, adheres to non-retribution practices and includes right to representation. After they are engaged, they will be required to produce proof that each worker has been inducted and signed that they have been inducted on the procedure.

### **7.6 Monitoring and Reporting**

**General Monitoring Activities:** Processes for monitoring, assessment and audit will be developed to:

- Document the implementation and effectiveness of management and mitigation measures;
- Assess actual impacts against predicted impacts; and
- Demonstrate compliance with applicable legal and other requirements.

Monitoring will be undertaken for both direct hires (including casual labor) and contract workers.

**Assessments:** The Resident Engineer or Site Supervisor will take a lead in undertaking periodic assessments to determine the degree to which, the commitments outlined in this LMP are being met. This will include camp inspections and monitoring of grievances.

**Audits:** It is envisaged that, the site supervisor or resident engineer may, at its discretion, audit the contractors or suppliers to determine their compliance with this LMP. In addition, they may also, at its discretion, undertake audits of other third-party facilities and providers, as relevant to the Environmental and Social Management Plan. The Independent Environmental and Social Consultant, on behalf of KWSSIP may also be engaged to conduct periodic monitoring reviews of the Project, largely based on the social and environmental controls set out in the Environmental and Social Management Plan.

**Performance indicators:** Performance indicators are used to measure and track performance against the effectiveness of mitigation and control measures described in this LMP. Indicators can be divided into two groups: leading indicators and lagging indicators. Leading indicators predict actions to be taken to prevent a risk from escalating - such as complaints from workers about, for example, the quality of camp food. An example of a lagging indicator would be a work stoppage over camp conditions. General performance indicators may also be relevant, such as training and awareness numbers. Performance indicators must be measurable against a specified target.

**Labor and Working Conditions Performance Indicators:** Performance indicators should be carefully recorded and graphed where relevant for remedial action to reduce potential risks. They will form a key component of monthly reporting by the Resident Engineer or Site Supervisor.

**Non-conformance and corrective action:** The project ESMPs alongside provisions in this LMP will be all used for tracking and stewardship of non-conformances identified as part of assessment and audit activities described in this LMP.

**Training and Awareness:** Before the development of a training and awareness program, a needs analysis will be conducted. The needs analysis will be based on requirements of this LMP. It involves a basic assessment of the knowledge and skills of the people involved in training implementation.

**Internal Reporting:** A periodic report will be compiled to address the labor and working conditions aspects contained in this document, including the following for both Consulting Engineer and contractor activities:

Workplace:

- Grievances lodged by type and number, illustrated with graphs. Open grievances by type and number;
- Disciplinary action by type and number;
- Induction training numbers, queries and comments;
- Issues raised by workers' committees and action taken;
- Workforce numbers by local and foreign workers - actual against planned;
- Actual demobilization numbers against planned targets. Incidents around demobilization;
- Industrial relations incidents - stoppages go slows, threats, damage to property, violence;
- Incidents, accidents, and near misses;
- Lost hours by category; and

- Absenteeism, sick leave and late arrivals.

Camp:

- Grievances lodged by type and number. Open grievances by type and number;
- Disciplinary action by type and number;
- Induction training numbers, queries and comments;
- Issues raised by camp committees and action taken;
- Camp numbers by local and foreign workers - actual against planned;
- Camp incidents;
- Food or lodging complaints; and
- Recreation activities.

**External Reporting:** Consulting Engineer and its contractors will meet all statutory notification and reporting requirements.

**Disclosure:** Disclosure will be done to enable workers understand information regarding safeguards in the workplace. This will be done during the induction period of the workers. Various tools will be used including: Information, education and communication (IEC) materials and Meetings, Induction toolkit (sexual and gender-based violence, EHS company policies, safety, code of conduct, and child protection).

## 7.7 Fatality and Serious Incidents

In the event of an occupational fatality or serious injury, the PIU shall report to the Bank as soon as becoming aware of such incidents and inform the government authorities (where available) in accordance with national as well as Bank reporting requirements. Corrective actions shall be implemented in response to project-related incidents or accidents. The PIU or, where relevant the consultant, may conduct a root cause analysis for designing and implementing further corrective actions.

## 8 AGE OF EMPLOYMENT

This Chapter explains the standards and methodology for determining the minimum age of labor for KWSSIP.

### 8.1 Minimum Age for Employment in the Project

Article 11(3) of the Constitution of Pakistan prohibits the employment of children below the age of 14 years in any factory, mines, or any other hazardous employment. In accordance with this Article, the Employment of Child Act (ECA) 1991 does not permit child labor in the country. The ECA defines a child as a person who has not completed their fourteenth years of age, where it further states that no child shall be employed or permitted to work in any of the occupation set forth in the ECA or any workshop wherein any processes defined in the Act is carried out. The KWSSIP PIU and its contractors will be bound by the ECA to disallow any child labor at the project sites or campsites.

Under the Sindh Factories Act, 2015, no adult employee, defined as a worker who has completed his or her 18<sup>th</sup> year of age, can be required or permitted to work in any establishment in excess of nine hours a day and 48 hours a week. Similarly, no young person under the age of 18, can be required or permitted to work in excess of seven hours a day and 42 hours a week. The Factories Act, which governs the conditions of work of industrial labor, applies to factories, employing ten or more workers.

According to the ESS 2 and the Sindh Prohibition of Employment of Children Act of 2017, no one under the age of 18 may be hired to work at the project site (s). The hiring process must specify how candidates' CNICs will be checked, so that no one under the age of 18 can be hired on site. It is necessary to inspect and confirm the applicant's original CNIC. The contractor(s) and the recruiting agents will be held accountable if any underage workers are discovered to be working on the project site(s). They will be fined and have their contracts terminated.

Under the ILO C138 (Minimum Age Convention, 1973), each Member of the Convention undertakes to pursue a national policy designed to ensure the effective abolition of child labor and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons. Article III thereof provides: (a) the minimum age for admission to any type of employment or work which by its nature or the circumstances in which it is carried out is likely to jeopardize the health, safety or morals of young persons shall not be less than 18 years; (b) the types of employment or work to which paragraph 1 of this Article applies shall be determined by national laws or regulations or by the competent authority, after consultation with the organizations of employers and workers concerned, where such exist; (c) notwithstanding, the provisions of paragraph 1 of this Article, national laws or regulations or the competent authority may, after consultation with the organizations of employers and workers concerned, where such exist, authorize employment or work as from the age of 16 years on condition that the health, safety, and morals of the young persons concerned are fully protected and that the young persons have received adequate specific instruction or vocational training in the relevant branch of activity.

The Sindh Prohibition of Employment of Children Act of 2017 states that any teenage worker (aged between 14 and 18) hired for training at the site(s) must be kept away from moving machinery and not given any dangerous tasks. Before allocating the task or job to an adolescent worker, a thorough risk evaluation of the assignment must be made.

Contractors will be required to verify and identify the age of all workers. This will require workers to provide official documents, which would include a birth certificate, CNIC, passport, or medical or school record. If a minor under the minimum labor eligible age is discovered working on the project, measures will be taken to immediately terminate the employment or engagement of the minor in a responsible manner, considering the best interests of the minor.

## **8.2 Age Verification**

Prior to the engagement of labor, age verification must be done and documented. Where available, verify the birthday on official records like a birth certificate, national identification card, or other reliable sources.

## 9 EMPLOYMENT TERMS AND CONDITIONS

This Chapter defines the employment terms and conditions applicable to the project employees.

### 9.1 General Requirements

The employment terms and conditions applicable to project employees as set out in the labor rules will apply to project employees who are assigned to work on the Project (Direct Workers). Terms and conditions of part-time workers are determined by their individual contracts.

The contractors' labor management procedure will set out terms and conditions for the contracted and subcontracted workers. These terms and conditions will be in line, at a minimum, with this LMP, the Sindh Factories Act 2015, and specified in the standard contracts to be used by the PIU KWSSIP under the project.

A contract of employment, written in a language known to all parties, shall be executed between the PIU and the direct worker that specifies the following:

- The parties involved, including the name of the worker, age, citizenship, civil status, gender, and address;
- Location of work with regard to the needed services, acceptance of the parties, qualifications of the worker, and attestation that the worker is not related within the third degree of consanguinity or affinity to the hiring authority and/or its representative, and the worker has not been previously dismissed from government service by reason of administrative offense;
- Terms and Conditions of the contract, including the hours and place of work, remuneration payable to the worker, job description, summary of deliverables, duration of contract, procedure for suspension or termination of contract, statement that there is no employer and employee relationship between the contracting parties.

As provided in the Sindh Factories Act, 2015, each worker who has completed a period of 12 months continuous service in a factory shall be allowed, during the subsequent period of twelve months, holidays for a period of fourteen consecutive days. If a worker fails in any one such period of twelve months to take the whole of the holidays allowed to him or her, any holidays not taken by him or her shall be added to the holidays allotted to him or her in the succeeding period of twelve months.

A worker shall be deemed to have completed a period of 12 months continuous service in a factory without considering any interruption in service during those 12 months due to sickness, accident or authorized leave not exceeding 90 days in the aggregate for all three.

### 9.2 Non-Discrimination and Equal Work Opportunities

Article 19-A of the Constitution imparts the State's obligations aimed at achieving equality in the form of securing the well-being of the people, regardless of sex, caste, creed, or race, by raising their standard of living, by preventing the concentration of wealth and means of production and distribution in the hands of a few to the detriment of general interest and by ensuring equitable adjustment of rights between employers and employees.



The KWSSIP PIU is committed to equal opportunities for all its employees and potential employees where everyone is treated with respect and dignity, where there is equal opportunity for all. All employees under KWSSIP, regardless of their affiliation, will be treated fairly and with respect. Selection for employment, promotion, training, or any other benefits will be on the basis of aptitude and ability. Decisions about pay and benefits, terms and conditions of employment, appraisals, dismissal, or redundancy will be made objectively and without unlawful discrimination. All employees will be helped and encouraged to develop their full potential, and the talents and resources of the workforce will be fully utilized to maximize the efficiency of the organization.

The KWSSIP PIU will ensure that:

- Equality and non-discriminatory policy are adhered to within its own area of responsibility;
- Spread awareness on the equality in employment policy to the attention of the team members;
- Ensure that information on the equality of opportunity is included in all indication processes; and
- Ensure that the team members are available to attend relevant quality training programs (if any)

The PIU is responsible for assuring that equality in employment is effectively communicated to all employees and all those involved with the organization at whatever level of position and for providing guidance where appropriate. It will also, in particular, provide full text and induction on equal opportunities to all new employees; translate this policy into Urdu and any other traditionally spoken languages and send to all relevant involved parties. In addition, upon any significant update, this policy will be presented to all members of staff or at department/office meetings and re-translated to all relevant involved parties.

Each member of staff has a responsibility to:

- Follow any measures introduced to ensure equality of opportunity and prevent discrimination, harassment, or bullying
- Report any discriminatory acts
- Treat others fairly without prejudice
- Promote a work environment where an individual can feel valued and realize their potential whilst encouraging others to do so also

Failure to comply with the policy, procedures and practices outlined below will be considered within the framework of the PIUs disciplinary procedure. The PIUs equal opportunity policy also covers bullying and harassment issues at the workplace and in any work-related setting outside the workplace.

### **9.3 Working Hours**

As per the Sindh Factories Act 2015 (Section 34), the Shops and Establishment Ordinance, 1969 (Section 8) and the Road Transport Ordinance, 1961 (Section 4) are used to determine working hours and any rest time in different industries.

Section 34 of the Factories act states “no adult worker shall be allowed (or required) to work in a factory for more than 48 hours in a week: if the factory is seasonal, 50 hours a week and if the work is of continuous nature, he may work for 56 hours in a week. As for the daily hours, these may not be more than 9 hours a day (in case of seasonal: 10 hours). The working hours of an adolescent (15-18) are 5 hours in a day. The Factories Act is applicable to all areas employing 10 or more workers. The law makes provisions for one weekly holiday and if that is not given, a compensatory holiday must be given as soon as possible.

The Shops and Establishments Ordinance 1969 also limits weekly working hours to 48 hours. The ordinance also covers shops and commercial establishments not regulated by the Factories Act, where it states that any adult worker is required to work overtime, If asked, where the rate of overtime payment is double the usual pay (Section 47). Overtime is not payable to the contract workers who are employed on a piece rate basis. The normal hours of work for project workers shall not exceed 8 hours a day for 5 days for a total of a 40-hour work week, exclusive of time for meals. Where exigencies of the service require such personnel to work for 6 days or 48 hours, the project workers shall be entitled to a compensatory time off to offset the overtime rendered. No worker shall be allowed to render services beyond the 48-hour overtime.

#### **9.4 Leaves and Weekly Rest**

Each project worker is entitled to a 2-day rest period during weekends (Saturday and Sunday). Workers shall be entitled to a rest day on regular holidays recognized by the province. Each worker is entitled to 10 days casual leave with full pay during a year. Workers are also entitled to 16 days sick leave with half pay (8 days with full pay) in a year. Festival holidays as notified by the provincial government with full pay (usually 10-13) are also allowed. If a worker is required to work on a festival holiday, he will be given one day additional compensatory holiday with full pay and a substitute holiday (300% of usual wages).

#### **9.5 Maternity Leave**

If a worker has completed 12 months of continuous service in a factory, he/she shall be allowed a paid annual leave of 14 consecutive days. Under the Maternity Benefits Ordinance 1958, leave is also allowed to pregnant women for a period of 12 weeks with full pay. It is unlawful for an employer to dismiss a women worker who is on maternity leave. The qualifying period for getting this leave is 4 months of preceding employment with the employer.

#### **9.6 Remuneration**

The laws relating to fixation and payment of remuneration include the Sindh Payment of Wages Act 2015, the Sindh Minimum Wages Act 2015 and the Sindh Terms of Employment (Standing Orders) Act 2015.

#### **9.7 Workers' Welfare**

The workers' welfare legislation includes Employees Old Age Benefits (EOAB) Act 1976 (with provisions for old age pension, old age grant, invalidity, and widow(er) pension). This Act is applicable to establishments employing five or more workers. Contribution has to be made

both by the employer (5% of minimum wages) and employee (1% minimum wages). Employees Social Security Ordinance 1965 (applicable like the EOAB Act) provides benefits to employees in case of sickness, maternity, employment injury or death. The amount in this scheme is contributed only by the employer to workers or their legal heirs in case of death, permanent total disablement, permanent partial disablement, and temporary disablement during working in an establishment. The Standing Orders 1968 also provides for compulsory group insurance against natural death and injury for all the permanency employees in a workplace.

## **9.8 Termination of Contract**

The contract of employment shall cease at the end of the period stated in the contract. However, the contract may be pre-terminated by the hiring authority due to breach of any provision thereof, breach of trust, loss of confidence, and for reasons detrimental to the interest of the agency, provided that the project worker is informed in writing at least 30 days prior to the effectivity of such termination. Likewise, the project worker may pre-terminate the contract provided that a written notice is submitted to the hiring authority, stating therein the reasons for the pre-termination, at least 30 days prior to the proposed date of effectivity thereof, and the same has been received, accepted, and approved in writing by the hiring authority.

Industrial and Commercial Employment (Standing Industrial and Commercial Employment (Standing Orders) Ordinance 1968 was enacted to address to the contractual relationship between employer and employee. The ordinance is applicable to establishments employing 20 or more workers. The ordinance classifies workmen in six classes: permanent, probationers, badlis, temporary, apprentices and contract workers (the last category was added in 2006). The legislation requires that workmen should be provided the contract in writing, showing the terms and conditions of his service, at the time of hiring, promotion and transfer. It also requires that the wage rates paid to different categories of workers/work should be posted on the notice boards.

Termination of an employment contract may be either termination simpliciter, which is termination on grounds other than misconduct after a notice (section 12) or termination on account of misconduct (section 15). Notice of termination, for termination simpliciter, is mandatory for permanent employees. A notice of one month must be served before severing the employment relationship or payment of one month's wages in lieu of notice may be provided (Section 12.1). The law also obliges the employer to provide the termination certificate in writing stating the reason behind it. Although there is no specific provision for just cause dismissal, the requirement of written termination letter and section 41 of IRA 2008 which allow the labor court to inquire into the legitimacy of termination provide that there should be bona fide and valid reason for dismissal.

Termination on account of trade union membership and activity is an invalid reason for termination (ILO, 2000). While termination is being done on account of misconduct, worker has still the right of fair hearing. Of the many types of misconduct is "go slow", for which a worker can be fired. Termination on economic reasons/retrenchment has not been focused in law; however, law does provide the procedure of retrenchment (last come, first go) and preference for rehiring of retrenched workmen. In case of laying off the workers, they must

also be given due notice or payment in lieu of notice. If the employer wants to close down the whole business or is terminating the employment of 50 or more workers, It must get the prior approval of labor court. An individual whose employment is terminated has first to use internal mechanisms for dispute resolution, however if he is not satisfied with the decision, he may appeal to the labor court. In that case, labor court is authorized to go into all the facts of the case and determine whether the termination was valid and bona fide or not. The above-mentioned ordinance also provides for severance pay/gratuity to be paid (when an employee resigns or his services are terminated other than misconduct) equivalent to 30 days wages for every completed year of service or any part thereof in excess of 6 months (for 20 years of service, this means 90 weeks of severance pay).

### **9.9 Deductions**

No deductions other than those agreed upon in the contract or those prescribed by law or regulations shall be made from a worker's remuneration. The hiring authority is prohibited to demand or accept from the worker any cash payment or gifts in return for admitting such worker to employment or for any other reasons connected with the terms and conditions of employment.

### **9.10 Medical Treatment of Sick and Injured Workers**

Any worker subjected to any illness, injury, or accident which was sustained during the work period shall be transported to the nearest clinic or hospital by the hiring authority or its representative.

### **9.11 Collective Agreements**

The duty to collectively bargain arises only between the "employer" and the "employee". Where neither party is an "employer" nor "employee" of the other, no such duty would exist. Considering that the terms and conditions provide that no employer-employee relationship shall exist between the contracting parties, there is no duty to bargain collectively.

Collective bargaining has also been called a fundamental right which emanates from article 17(1) of the Constitution. A trade union can move application for determination of Collective Bargaining Agent (CBA) if it has its members not less than one-third of those employed as workmen. However, if more than one union exists in the premises, the registrar of trade unions will conduct a secret ballot election/referendum and will issue the CBA certificate to union securing votes not less than one third of total votes. If none of the union is able to get one third of total votes, a run-off election between the top two unions will be held and the union getting majority votes will be certified as collective bargaining agent. Not every workman employed in the premises is eligible for voting (Section 24.5). When a union is certified as a CBA, no application for (re) determination of CBA can be made for a period of two years except where the registration of trade union/CBA is cancelled. The CBA is entitled to undertake collective bargaining with the employer or employers on matters connected with employment, non-employment, the term of employment or the conditions of work other than matters which relate to the enforcement of any right guaranteed or secured to it or any workman by or under any law, other than this Act , or any award or settlement; represent all or any of the workmen in any proceedings; give notice of, and declare, a strike and nominate representatives of

workmen on the Board of Trustees of any welfare institutions or Provident Funds (IRA 2008: Section 24.13).

## 10 GRIEVANCE REDRESSAL MECHANISM

This Chapter describes the requirements for establishing a grievance redressal mechanism (GRM) to be established for the project workers.

### 10.1 Legislative Requirements

As per Article 46 of the industrial Relations Ordinance (IRO) 2002, any worker may bring his/her grievance in respect of any right guaranteed or secured by or under any law or any award or settlement to the notice of the employer in writing, either him or herself or through the shop steward or CBA, within one month of the day on which cause of such grievance arises. The IRO 2002 reduces the delay from three months to one month. Where a worker brings his or her grievance to the notice of the employer, the employer must, within 15 days for the grievance, communicate his or her decision in writing to the worker.

### 10.2 GRM for Project Workers

For the KWSSIP Project, the PIU and its contractors will establish a separate GRM (or make provisions in the overall GRM) for the project workers to address labor or workplace related concerns consistent with the applicable national and provincial laws and ESS2 before the Project Effectiveness and highlight it in the Project Operations Manual.

Typical grievances that may arise in the workplace include demand for employment, labor wage rates, delays in payment, discontentment with working conditions, labor camp issues, and overall health and safety conditions of the work environment. A GRM structure will be established for project workers (direct workers and contracted/ supply workers) as required under ESS2. Handling of grievances will require objectivity, promptness, and responsiveness' to the needs and concerns of aggrieved workers.

The worker's GRM will also allow for anonymous complaints to be raised and addressed. Individuals who submit their complaints or grievances may request that their names be kept confidential, and this should be respected. Under ESS2, a worker's GRM will be provided for all project workers, including direct workers, contracted/ supply workers, to raise workplace concerns, including SEA/SH issues at the workplace. Any type of worker who has any complaint or grievance has the right to present it and eventually receive a proper response against it.

According to ESS2, different types of workers may approach the workers' GRM for the following key reasons (amongst many others):

- Demand for employment opportunities
- Labor wage rates and delays in payment of wages
- Disagreements over working conditions
- SEA/SH in the workplace
- OHS concerns in the workplace

The workers' GRM which is different from the project GRM, will leverage existing procedures and systems, and will be established in the early stages of the project, whilst serving throughout project implementation. The workers' GRM will be based on the requirements of

the WB's ESS2. Specifically, the workers' GRM will operate according to following key principles:

- It will be made available for all direct and contracted workers (and their organizations, wherever relevant)
- It will be proportionate to the nature and scale and the potential risks and impacts foreseen from the project
- It will be designed to promptly address concerns using an understandable and transparent process that provides timely feedback to those concerned in a language they understand without any backlash
- It will be a free to use system, where complaining workers will not pay any fees to use the worker GRM
- It will utilize existing grievance systems and experiences. In this context, the worker GRM will leverage Human Resource (HR) counseling procedures for direct workers that are available at their respective health ministries and departments, and will ensure HR procedures at contractor's organizations are consistent with the official worker GRM system characterized in this document, which will be further references in their working agreements, and monitored accordingly
- Anonymous grievances are also allowed and facilitated, and will be treated equally as any other grievances, whose origin is known, however, a suitable contact information is a must to be able to communicate responses back
- There will be no discrimination against those who express grievances, and any and all grievances will be treated confidentially
- It does not replace or override requirements to provide workplace processes to report work situations that a project worker believes are not safe or unhealthy
- Workers will be able to raise concerns regarding unsafe or unhealthy working conditions throughout the project
- It will not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.

The worker's GRM will contain the following design and procedures:

Information about the existence of the grievance mechanism will be readily available to all project workers through notice boards, the presence of "suggestion/ complaint boxes", including the different methods of communication, redressal timelines, and rights of workers.

The complainant should be able to use mobile phone-based applications, and in person centers/ mechanisms for complaint registration and resolution, and a free hotline linked with a call center. The grievance will be addressed through each area of feedback value chain:

- i. Uptake
- ii. Sorting and processing
- iii. Acknowledgement and follow up
- iv. Verification, investigation, and action
- v. Monitoring & Evaluation
- vi. Provision of feedback to the complainant to ensure effectiveness.

Grievance handling will be done in a transparent manner, where aggrieved workers will be informed within 10 days of their grievance application, either with a respective solution or with a request of extension.

The aggrieved worker will have the option to refer to a grievance log with key information that will be established by the PIU and quarterly reported upon.

If not satisfied with the outcome of the grievance at the contractor level, the aggrieved party will be able to access the Grievance Redressal Committee (GRC) established at the PIU level, where the GRC will be responsible for the redress mechanism in the areas of labor, environment, and social aspects along with project management.

The mechanism for resolving workers' grievances will be described in the context of staff induction training, which will be provided to all workers.

### **Collective Grievances and Disputes Resulting from the Negotiations of Collective Agreements**

When a trade union is recognized, it is entitled to negotiate on a regular basis with the employer over terms and conditions existing at the workplace and the employer is obliged to negotiate with them also. The procedures followed in such circumstances are usually contained in the agreement, which states how the issues are raised, the procedure for negotiations, the composition of the parties involved in the negotiations, and the procedure to deal with issues that are not resolved through consensus. If the dispute is not resolved at the workplace, the parties to the dispute can utilize the dispute resolution mechanisms provided in the labor legislation.

### **Sexual Exploitation and Workplace Sexual Harassment**

A separate GRM (or specific arrangements within existing GRM) will be established specifically for the purpose of confidentially receiving grievances related to SEA/SH. All SEA/SH related complaints, with the survivor's consent, will be referenced to the project identified service provider who will further manage the case in a survivor-centric approach and will report back to the project GBV GRM once the case is solved. In addition, the ESIA/ESMP will identify additional mitigation measures, including the contractors' ESMP or contractors specific LMP, where required. This will include engagement with communities on gender related risks, grievance, and response measures available as identified in the manual.

The PIU will, with support from consultants, identify institutions and service providers who are actively engaging in the prevention of gender-based violence, sexual exploitation, and workplace sexual harassment in order to establish a manual for referencing potential survivors. The PIU and the contractor are usually not equipped to handle complaints or provide relevant services to survivors, but will reference any person to relevant service providers, including health facilities, law enforcement agency's gender unit or others, as relevant using the information on available services.

All concerned responsible staff shall hold regular meetings with project workers to discuss any work-related issues and concerns. Every grievance raised by a worker will be documented with the actions undertaken by the PIU and contractors to address such grievance. The aggrieved worker may raise any issue anonymously through a letter which shall be submitted



to their immediate supervisor's office. Any grievances which are left unattended by the contractor can be submitted by the worker to the PIU, in which case, actions shall be taken to resolve the issue. Any labor dispute shall be first resolved through mediation, conciliation, and arbitration, in order to provide an efficient procedure in the settlement of disputes and to promote autonomy and freedom of the parties to make their own arrangements to resolve their grievance.

## 11 CONTRACTOR MANAGEMENT

The Project Team shall select contractors through a transparent process. It will review the following during the contractor selection process:

- Knowledge gathered through publicly available sources, such as company registers and papers pertaining to alleged infractions of applicable labor laws, such as inspection reports and other documentation from enforcement agencies;
- Business licenses, registrations, permits, and approvals;
- Labor management system documents, such as labor management procedures, that address OHS concerns;
- Identification, credentials, and certifications of labor management, safety, and health employees;
- Workers' certifications/permits/training to perform required work;
- Records of safety and health violations, reactions, recordable occurrences, and accompanying Root Cause Analysis (lost time incidents, medical treatment cases), first aid cases, high potential near misses, and necessary corrective and preventive actions (for example, revised job safety analysis, new or different equipment, skills training, and so forth);
- Accident and fatality records and notifications to authorities/ lending agencies;
- Records of the benefits that employees are legally required to receive and evidence that they have enrolled in the relevant programs;
- Worker payroll records, including hours worked and pay received;
- Identification of safety committee members and records of meetings; and
- Copies of prior agreements with suppliers and contractors that have clauses and terms that are materially consistent with ESS2.

The contract document shall include the contractor's commitment to:

- providing a construction management plan that includes reporting all pertinent project information, including workplace accidents;
- Employing suitably qualified personnel for high risk jobs;
- Taking into account all occupational, safety and health considerations for its workers and at the site(s);
- Provision of first aid facilities;
- Provision of hygienic canteen and rest facilities at the site(s) and in camps (if applicable);
- Provision of PPE commensurate with the nature of job;
- Provision of traffic management plan;
- Conformance of all labor laws and regulations;
- Written code of conduct;
- Emergency response plans;
- Provision of site security plan;
- Labor influx management plan;
- Prohibition of child labor
- Employment of female workers for certain jobs and sexual harassment prevention.

## 12 PRIMARY SUPPLY WORKERS

The number and type of primary suppliers will be defined once the contractors define and prepare their work plans and make the corresponding adjustments to the designs to optimize them. The construction work under the Project will require the involvement of primary supplies including construction materials essential for the functions of the proposed infrastructure, such as cement, aggregates, sand, and bitumen.

Some contractors may also be able to produce such construction materials by their workforce. However, where the contractor will source essential materials directly from Primary Suppliers on an ongoing basis, the workers engaged by such primary suppliers that meet all three criteria are deemed “primary supply workers”, as defined in ESS2.

As discussed in Chapter 3 (Key Labor Risks), the OHS risks are also deemed to be generally significant in the construction sector including quarry sites. To address these potential risks, the following measures will be taken:

**Selection of primary suppliers:** When sourcing for primary suppliers, the project will require such suppliers to identify the risk of child labor/ forced labor and serious safety risks associated with the primary supply chain. The PIU and the consultants will review and approve the purchase of primary supplies from the suppliers following such risk identification/ assessment. Where appropriate, the Project will be required to include specific requirements on child labor/ forced labor and work safety issues in all purchase orders and contracts with primary suppliers.

**Remedial Process:** If child labor/ forced labor and/or serious safety risks are identified, the PIU and the consultants will require the primary supplier to take the appropriate steps to rectify them. Such mitigation measures will be monitored periodically to assess their effectiveness. Where the mitigation measures are found to be ineffective, the PIU and the consultants will, within reasonable period, shift the project’s primary suppliers to suppliers that can demonstrate that they are meeting the relevant requirements.

The PIU will oversee the procurements of goods and materials requirements under the construction works. Project contractors will not be responsible for procurement and supply of materials and equipment under the same conditions and specifications on ESHS aspects in its contracting agreements.

Potential risks of child labor forced labor, and serious safety issues which may arise in relation to primary suppliers shall be identified in the ESMP/ESIAs to be conducted in relation to each of the sub-projects.

Where there is a significant risk of child labor or forced labor related to primary supply workers, the Project Team will require the primary supplier to identify those risks in relation use of child labor, forced labor. The labor management procedures will set out roles and responsibilities for monitoring primary suppliers.

Where there is a significant risk of serious safety issues related to primary supply workers, the Project Team shall require the relevant primary supplier to introduce procedures and mitigation measures to address such safety issues. These procedures and mitigation measures will be reviewed periodically to check their effectiveness. In case the Project Team is unable to control the primary suppliers with respect to their failure to address the safety issues with respect to child labor or forced labor, it may hire those suppliers who comply with requirements of ESS2 and address the risks regarding use of labor or forced labor as identified in the ESMP.

## Annex I – Template for Worker’s Code of Conduct

### Code of Conduct

I, \_\_\_\_\_, acknowledge that preventing any misconduct as stipulated in this code of conduct, including sexual exploitation and abuse (SEA), sexual harassment (SH), and child abuse/exploitation are important. Any activity, which constitute acts of gross misconduct are therefore grounds for sanctions, penalties or even termination of employment. All forms of misconduct are unacceptable be it on the work site, the work site surroundings, or at worker’s camps. Prosecution of those who commit any such misconduct will be pursued as appropriate. I agree that while working on this project, I will:

1. Consent to security background check;
2. Treat women, children (persons under the age of 18) and persons with disability with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, birth or other status;
3. Not use language or behavior towards men, women or children/learners that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate;
4. Carry out his/her duties competently and diligently;
5. Comply with this Code of Conduct and all applicable laws, regulations and other requirements, including requirements to protect the health, safety and well-being of other Contractor’s Personnel and any other person;
6. Maintain a safe working environment including by:
  - a. ensuring that workplaces, machinery, equipment and processes under each person’s control are safe and without risk to health;
  - b. wearing required personal protective equipment;
  - c. using appropriate measures relating to chemical, physical and biological substances and agents; and
  - d. following applicable emergency operating procedures.
7. Report work situations that he/she believes are not safe or healthy and remove himself/herself from a work situation which he/she reasonably believes presents an imminent and danger to his/her life or health;
8. Treat other people with respect, and not discriminate against specific groups such as women, people with disabilities, migrant workers or children;
9. Not engage in any form of sexual harassment including unwelcome sexual advances, requests for sexual favors, and other unwanted verbal or physical conduct of a sexual nature with other Contractor’s or Employer’s Personnel;
10. Not participate in sexual activity with children/learners—including grooming or through digital media. Mistaken belief regarding the age of a child and consent from the child is not a defense;
11. Not exchange money, employment, goods, or services for sex, with community members including sexual favors or other forms of humiliating, degrading or exploitative behavior;

12. Attend trainings related to HIV and AIDS, SAE/SH, occupational health and any other relevant courses on safety as requested by my employer
13. Report to the relevant committee any situation where I may have concerns or suspicions regarding acts of misconduct by a fellow worker, whether in my company or not, or any breaches of this code of conduct provided it is done in good faith;
14. Regarding children (under the age of 18):
  - a) Refrain from hiring children for domestic or other labor, which is inappropriate given their age, or developmental stage, which interferes with their time available for education and recreational activities, or which places them at significant risk of injury.
  - b) Comply with all relevant local legislation, including labor laws in relation to child labor.
15. Refrain from any form of theft for assets and facilities including from surrounding communities.
16. Remain in designated working area during working hours;
17. Refrain from possession of alcohol and illegal drugs and other controlled substances in the workplace and being under influence of these substances on the job and during working hours;
18. Follow prescribed environmental occupation health and safety standards;
19. Channel grievances through the established grievance redress mechanism.

I understand that the onus is on me to use common sense and avoid actions or behaviors that could be construed as misconduct or breach this code of conduct.

I acknowledge that I have read and understand this Code of Conduct, and the implications have been explained with regard to sanctions on-going employment should I not comply.

Signed by: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

For the Employer/Contractor

Signed by: \_\_\_\_\_  
Signature: \_\_\_\_\_  
1. Date: \_\_\_\_\_

## Annex II: Suggested Measure to be included in the Contracts

Stage of Contractual Process	Suggested Due Diligence
Before bidding	<ul style="list-style-type: none"> <li>• Ensure that the terms of reference clearly define the supervision engineer’s responsibilities regarding oversight of, and reporting on, labor influx and workers’ camps.</li> <li>• Ensure the team skills in the terms of reference clearly include key staff qualified and experienced in managing similar projects, and demonstrated capacity to manage social and environmental issues, including issues pertaining to community health and safety.</li> <li>• Ensure that the project GRM is established and its use is widely publicized.</li> </ul>
Preparation of bidding documents	<ul style="list-style-type: none"> <li>• Review contract conditions included in bidding documents to: (i) Ensure that the relevant mitigation measures in the ESMP are reflected and budgeted in the contract, (ii) Ensure the ESMP forms part of, and is explicitly referred to in the bidding documents. (iii) Identify relevant provisions (workers, camps, child and forced labor, occupational health and safety, grievance redress, etc.) regulating the contractor’s responsibility and identify any gaps, inconsistencies or areas of concern that could be addressed through additional provisions in the “particular conditions of contract” and/or technical specifications (iv) Include a requirement that all workers sign ‘Codes of Conduct’ governing behavior, and identifying sanctions (v) Clearly identify that training programs on implementing the Codes of Conduct, etc. will be undertaken by external providers</li> <li>• Ensure the contract conditions and matrix of consequences clearly specify what type of penalty the contractor will face if the provisions of the ESMP and CESMP including OHS MP are not adhered to—including by subcontractors. This may include direct consequences to contractors in the form of penalties for poor performance on social and environmental matters or specific Performance Securities for ESMP and CESMP compliance.</li> <li>• Ensure that bidding documents clearly indicate OHS standards that are going to be applicable to different aspects of the works</li> <li>• Ensure bidding documents make clear the responsibilities of the contractor to prepare and adhere to a CESMP based on the ESMP and that no civil works will commence until the CESMP has been approved by the supervision engineer.</li> <li>• Ensure the bidding documents detail how the contractor and supervision engineer will be required to monitor and report on the impacts on the local community, issues related to labor influx and workers’ camps.</li> </ul>

	<ul style="list-style-type: none"> <li>Propose Key Performance Indicators (KPIs) for Contract Management, reflecting issues and risks specific to the contract and the monitoring plan.</li> </ul>
Bidding evaluation	<ul style="list-style-type: none"> <li>Review the bid evaluation report and request to review the bids where appropriate, to verify for the recommended bidder that documents related to the ESMP, safeguard implementation capacity, and other obligations of the contractor required to be submitted with the bid are sufficiently detailed and cover the contractual requirements.</li> <li>Require the contractor's representative or dedicated community liaison staff to have the ability to communicate in the language of the Borrower and/or the local language.</li> <li>Verify that the contract management framework identifies clearly lines of communication and that these are formalized and a consistent record is provided.</li> <li>Ensure that the contractor meets the project's OHS requirements for capability and experience.</li> </ul>
After contract signing	<ul style="list-style-type: none"> <li>Prior to commencing works, the contractor submits CESMP(s) based on the ESMP, which includes specific management plans for: (i) work activities; (ii) traffic management; (iii) occupational health and safety; (iv) environmental management; (v) social management; and (vi) labor influx.</li> <li>Supervision engineer reviews and approves the CESMP— with inputs from appropriate Government agencies—before any works start. For moderate risk sub-projects, the supervision consultants should review and clear the CESMP. Borrower should disclose the approved CESMP.</li> <li>Supervision Engineers must approve occupational health and safety management plan is approved before contractor is mobilized at site</li> </ul>



**Annex III: Written Particulars of Employment**

1. Name of Employer  
.....
2. Name of Employee  
.....
3. Date Employment began  
.....
4. Wage and Method of Calculation  
.....
5. Interval at which wages are paid  
.....
6. Normal Hours of work  
.....
7. Short description of employee's work  
.....
8. Probation Period  
.....
9. Annual Holiday Entitlement  
.....
10. Paid Public Holiday  
.....
11. Payment during sickness  
.....
12. Maternity Leave (if employee female)  
.....
13. Nursing Break Entitlement (for female employee)  
.....
14. Notice employee entitled to receive  
.....
15. Notice employer required to give  
.....
16. Any other matter either party wishes to include  
.....

**Notes:**

- (a) An employee is free to join a trade union or staff association, which is recognized by the undertaking. The address of the Trade Union or Staff Association is:
- (b) The grievance procedure and disciplinary procedure in this undertaking requires to be followed when a grievance arises or disciplinary action that needs to be taken.
- (c) When any heading is inapplicable enter NIL.

.....  
.....

Employer's signature

Witness

.....  
.....

Employee's signature

Witness

.....  
.....

Date

Date....

### Annex IV: Contractors SHE File Monitoring Form

Contractor Name; .....

**Instructions;** Tick (√) if available, put a cross (X) if unavailable. Tick (√) if there was activity, put a cross (X) if there was no activity. Tick (√) if there's evidence, put a cross (X) if there's no evidence. Make a Comment according to the changes that have taken place as reflected by availability, activity and evidence on each SHE item.

#	Monthly Checklist: SHE items	Available	Activity	Evidence	Comment
1	Exposure to Labor Policies,				
2	Valid Working Contract,				
3	Current Employee List				
4	Confirmation Letter Inc. copy of ID (per employee),				
5	Understanding of Resources, roles, responsibilities & authority,				
6	Inductions - all contractor staff				
7	HIRA & Reporting; Incidents, accidents & near misses				
8	Appointment letters;				
9	SHE Certificates; Safety Rep				
10	SHE Certificates; 1st Aider				
11	Mandatory Qualifications – as per the evaluation form				
12	Vehicles; Bluebook, Daily inspection sheet, Driver Permit				
13	Current Evaluation form,				
14	PPE: Branded & Properly worn at all times,				

<b>15</b>	Internal Communication; minutes showing meetings,				
<b>16</b>	Environment Management Aspects				
<b>17</b>	First Aid Kit: availability and usage of the form,				
<b>8</b>	Fire extinguisher; valid				
<b>29</b>	Any other				

PIU Rep .....

Signature .....

Date compiled .....

Contractor Rep .....

Signature .....

Date compiled .....

## Annex V: Maintaining Safe and Healthy Conditions for Workers at the Labor Camps

The minimum requirements for maintaining safe and healthy conditions for workers are provided below. The contractors can follow their own OHS policies and requirements.

### First AID

Site assessment should be carried out for determining needs of first aid (no. of workers, nature of the works undertaken, hazards present, site geology and access to emergency assistance, etc). Based on needs assessment, an adequate first aid facility shall be maintained by health & safety representative and made available in every labor camp for the emergency treatment of injured persons. Such facilities shall be in charge of a person trained to administer first aid and will be readily accessible for use at all times. The person should also be trained in Cardiopulmonary resuscitation (CPR).

The employer should ensure that qualified first-aid can be provided at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work · Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response Where the scale of work or the type of activity being carried out so requires, dedicated and appropriately equipped first aid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids. Records for treatment should be maintained. Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

#### First Aid Box Contents Checklist

ITEM	Quantity Specified	Quantity Present in Box	Comment
Adhesive elastic plasters assorted 20's	1 Box		
Roller bandages-conforming 100mm	4 Rolls		
Roller bandages-conforming 75mm	4 Rolls		
CPR Mouthpieces	2		
Cotton wool 50 gram	2 Rolls		
Fabric roll plaster 25mm x3M	1 Roll		
First Aid dressing No 3 75x 100mm	4		

First Aid dressing No 4 200mm	150x	4		
Forceps- 10cm		1		
Gauze swabs 75mm x 75mm 100's		1 Packet		
Gauze swabs 75mmx75mm Sterile 5's		2 Packets		
Gloves-Latex Large		2 Pairs		
Gloves-Latex Medium		2 Pairs		
Hypoallergenic Adhesive Tape 25mm x 3M		1 Roll		
Safety Pins Bunch of 12		1 Bunch		
Scissors- 10cm		1		
Splints-Straight		2		
Triangular Bandages		4		
Wound Cleaner- CENTRIMIDE 1% 100ml		1 Bottle		

1. Items in the first aid box are minimum contents as per the Occupational Health and Safety requirements.
2. Checklist must be completed every month to ensure compliance with the LMP.
3. Contents should be regularly replenished by respective department
4. Any deficiencies should be reported to the H&S Specialist or PIU Representative.

**Shelter construction & Facilities:** Beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles shall be provided in every room used for sleeping purposes. All sites shall be adequate in size to prevent overcrowding of necessary structures. Each room used for sleeping purposes shall contain at least 50 square feet of floor space for each occupant. At least a 7-foot ceiling shall be provided. Floors shall be of smooth and tight construction. The floors shall be kept in good repair.

All living quarters shall be provided with windows, the total of which shall be not less than one-tenth of the floor area. At least one-half of each window shall be so constructed that it can be opened for purposes of ventilation. Where electric service is available, each habitable room in a camp shall be provided with at least one ceiling-type light fixture and at least one separate floor- or wall-type convenience outlet. Laundry and toilet rooms and rooms where people congregate shall contain at least one ceiling or wall-type fixture.

An adequate supply of running water shall be provided for bathing and laundry purposes. Laundry, hand washing, and bathing facilities shall be provided. Floors shall be of smooth finish but not slippery materials; they shall be impervious to moisture. Floor drains shall be provided in all shower baths, shower rooms, or laundry rooms to remove waste water and

facilitate cleaning. All junctions of the curbing and the floor shall be covered. The walls and partitions of shower rooms shall be smooth and impervious to the height of splash.

**Toilet facilities:** Toilet facilities adequate for the capacity of the camp shall be provided. Toilet rooms shall have a window not less than 6 square feet in area opening directly to the outside area or otherwise be satisfactorily ventilated. No fixture, water closet, chemical toilet, or urinal shall be located in a room used for other than toilet purposes. Where the toilet rooms are shared, such as in multifamily shelters and in barracks type facilities, separate toilet rooms shall be provided for each gender. These rooms shall be distinctly marked "for men" and "for women" by signs printed in Urdu and Sindhi languages of the persons occupying the camp, or marked with easily understood pictures or symbols. If the facilities for 31 each gender are in the same building, they shall be separated by solid walls or partitions extending from the floor to the roof or ceiling. Every water closet installed shall be located in a toilet room. Each toilet room shall be lighted naturally, or artificially by a safe type of lighting at all hours of the day and night. Toilet rooms shall be kept in a sanitary condition. They shall be cleaned at least daily.

**Water supply:** An adequate and convenient water supply, approved by the health & safety representative, shall be provided in each camp for drinking, cooking, bathing, and laundry purposes. The distribution lines shall be capable of supplying water at normal operating pressures to all fixtures for simultaneous operation. Where water under pressure is available, one or more drinking fountains shall be provided for each 100 occupants or fraction thereof.

**Kitchen and Dining Area:** A properly constructed kitchen and dining hall adequate in size, separate from the sleeping quarters of any of the workers, shall be provided in connection with all food handling facilities. There shall be no direct opening from living or sleeping quarters into a kitchen or dining hall. No person with any communicable disease shall be employed or permitted to work in the preparation, cooking, serving, or other handling of food, foodstuffs, or materials used therein, in any kitchen or dining room operated in connection with a camp or regularly used by persons living in a camp.

**Sewage/Drainage Facilities:** The toilets constructed at the labor camps should have associated septic tanks for primary treatment of the sewage. All sites used for camps shall be adequately drained. The camp shall be located in such manner that the drainage from and through the camp will not endanger any domestic or public water supply. All sites shall be graded, ditched, and rendered free from depressions in which water may become a nuisance. Construction and operation of kitchens, dining hall, and feeding facilities.

**Fire Fighting:** Firefighting facilities will be established in the camp to deal with the event of fire. Different types of fire extinguishers (powder, foam and carbon dioxide) will be placed at different suitable locations in the camp. These locations should be selected after a risk assessment and should be easily accessible in the event of fire. Fire alarm system providing adequate and audible warning to all the staff in the camp will be installed. The camp Plan shall include adequate escape and evacuation processes in case of fire or another emergency. This should include contingencies. Escape and rescue ways are to be kept

free of any type of hurdles/barriers. All fire exits shall be distinctively marked in a language understood by the majority of the workers and in red letters of adequate size or by some other effective and clearly understood sign.

**Waste Management:** In the labor camp proper collection and disposal of solid waste will be ensured. Separate waste bins will be provided at different locations in the camp to collect organic and inorganic waste. These waste bins will be marked. The segregation of waste at source will be ensured. Inorganic waste will be stored at a safe location within the camp and organic waste will be handed over to waste collector on daily basis.

**COVID-19 SOPs:** The following SOPs related to COVID-19 will be followed in the labor camp:

- Maintain a physical distance of 6ft (2 m) minimum
- Wear a surgical mask or face covering whenever in close contact of someone. Mask shall be provided by the company free of cost
- Wash your hands-on arrival at work and regularly through the day;
- Wash hands before and after each meeting;
- No hand shaking
- Meetings are to be held in locations that allow for 4 meters distance between attendees in a closed confined space (meeting room/office block)
- Self-monitoring of health by all and reporting any illness at the earliest to the supervisor.
- Proper cleaning and frequent sanitization (at-least once a day) of the rooms, particularly of the frequently touched surfaces must be ensured.
- Proper disposal of face covers / masks / gloves left over by visitors and/or employees in covered bins, shall be ensured
- The doctor and HSE Manager in the camp shall be responsible to provide training to workers on spread of COVID-19 and control measures.



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## Annex VI – Guideline for Policies and Procedures

### a) Emergency Response Procedure

#### 1.0 PURPOSE

The purpose of this plan is to:

- 1.1 Provide guidelines for using internal and external resources to effectively and quickly respond to emergencies covered within the Scope of the Emergency Response Plan at the Project Site in order to:
  - Eliminate or minimize injuries to personnel.
  - Protect the Environment.
  - Prevent or minimize damage to Project site and equipment.
- 1.2 Ensure communication of all essential information to the appropriate personnel as quickly as possible.
- 1.3 Identify the responsibilities of site personnel when an emergency occurs.
- 1.4 Identify training required in order to ensure a high level of preparedness at all times.

#### 2.0 SCOPE:

The Emergency Response Plan for KWSSIP has been developed to respond to the following emergencies at the facility:

- Serious fire or explosion
- Bomb threat
- Medical Emergencies.
- Civil unrest
- Earthquake
- Heavy Rains and Floods

#### 3.0 RESPONSIBILITY:

The Project Manager is responsible to establish, implement and maintain the procedure.

- 3.1 All persons designated in this document shall ensure the effective implementation of Emergency Response Plan

#### 4.0 DEFINITIONS:

- 4.1 **Emergency Response Plan** Emergency Response Plan outlines the steps, which should be followed to enable the Company to respond effectively to an emergency. It addresses:
  - Emergency Team
  - Emergency Notification and Communication Plans.

- Contingency Plans.
- Training Requirements.

#### 4.2 **Contingency Plan**

A response plan specially developed for individual emergency scenario (e.g., fire, medical etc.) which is envisioned to occur. Contingency Plans complement an Emergency Response Plan and enable detailed provision to be made for each emergency envisioned.

#### 4.3 **Incident**

An unplanned event that results in an injury, fire or explosion, a spill or leak, damage to property, personnel, general public or visitors.

#### 4.4 **Emergency**

Emergency may be defined as a sudden event causing or has the potential to cause serious human injury and/or damage to the company assets and/or environmental degradation of large magnitude.

#### 4.5 **Level 1 Emergency**

An emergency that can be controlled or handled by Internal Resources and concerned personnel and **DOES NOT** require the assistance of the local emergency services.

#### 4.6 **Level 2 Emergency**

This is an emergency that requires assistance from the local emergency services, e.g. KMC. Level 2 emergencies can result from a natural disaster, large fire or a spill.

#### 4.7 **Incident Commander**

The Incident Commander is the person responsible for the overall management of the emergency.

#### 4.8 **Visitor**

For the purposes of this plan, a Visitor is anyone within the site boundaries who is not an employee. This includes suppliers, vendors etc.

### 5.0 **ORGANIZATION:**

Organogram of Emergency Response for KWSSIP is shown in Annexure II.

#### 5.1 **Incident Commander**

*Purpose:*

To handle and control the Emergency Situation using best available resources

*Functions:*

- He is overall in-charge of any incident/accident at the Project Site and will communicate any incident to the Project Director.

#### 5.2 **Fire Fighting Team**

*Purpose:*

To control fires, smoke and explosion during an emergency

*Functions:*

- Extinguish the fire.

- Control Smoke and Explosion.
- Cordon off affected area and restrict entry of non-concerned people.
- Carry out Rescue and Evacuation of trapped personnel.

### 5.3 **First Aid Team**

*Purpose:*

To provide Medical Attention to Injured Personnel

*Functions:*

- To provide medical care to injured personnel
- To send the injured personnel to the clinic or hospital as appropriate.
- To accompany the injured personnel to the hospital, as directed by Incident Commander

## 6.0 **COMMUNICATION RESPONSIBILITIES:**

- 6.1 For a Level 1 emergency Incident Commander shall contact the emergency services in the area like the Fire Brigade.
- 6.2 For a Level 1 emergency, which involves a medical emergency, the Incident Commander shall call ambulance service and advise them of the nature of the emergency during the phone call.
- 6.3 For both Levels of Emergency, Incident Commander shall inform the Project Director immediately.

## 7.0 **EVACUATION:**

- 7.1 Upon hearing the fire alarm, visitors and staff who have not been assigned a responsibility in the Emergency Response Plan shall be asked to go to the designated Assembly Point
- 7.2 Once assembled, the Incident Commander shall perform a head count in order to confirm the presence or absence of the employees at the project site.
- 7.3 In case anyone is missing, Incident Commander shall call on their mobile to check where they are located.
- 7.4 Personnel may return to their work places after the emergency is over

## 8.0 **CONTINGENCY PLANS:**

### 8.1 **Purpose**

Contingency plans have been developed to provide guidelines for responding to incidents and emergencies that can occur within the facility. Since it is impossible to predict exact conditions during an actual emergency, they are to be used as guidelines for the response and modified as necessary.

### 8.2 The following Contingency Plans have been developed for KWSSIP:

- *Fire*
- *Bomb threat*

- *Earthquake*
  - *Medical Emergencies*
  - *Heavy Rains and Flooding*
  - *Civil Unrest*
- 8.3 The Incident Commander is authorized to activate the Contingency Plan for incidents at the office.
- 8.4 The Emergency Response Team working with led by the Incident commander is responsible for implementing the response defined within the Contingency Plan. It is recognized that the actual response may vary from the Contingency Plan.
- 8.5 The following general procedures should be considered when implementing an emergency response:
- 8.5.1 Response should be developed in the following order of priority:
- Rescue of injured or trapped personnel.
  - Protection of the environment.
  - Protection of KWSSIP assets

## **9.0 DEACTIVATION AND RECOVERY PLAN:**

- 9.1 Deactivation of Emergency Response Plan
- The Incident Commander is responsible for deactivating the emergency response plan at the end of the emergency.
  - He shall make this decision after consulting with the Director and other members of the emergency response teams, as appropriate.
  - He will then notify all that the emergency has ended.
  - The emergency area will be barricaded to prevent entry by unauthorized personnel.
- 9.2 Following general actions should be taken by the respective Teams at the conclusion of the emergency:
- Emergencies Involving Fires
  - Arrange for firefighting equipment used during the emergency to be refilled before returning them to their correct location.
  - Clean the fire area, after receiving authorization from the Incident Investigation Team Leader.
  - Submit Incident Report to Incident Commander with copy to Project Director.

## **10.0 INCIDENT INVESTIGATION:**

- 10.1 As per the legal requirements, the incident investigation team will investigate all incidents and emergencies, and to develop recommendations to prevent recurrence.
- 10.2 The Incident Commander shall ensure that the following items of evidence are preserved for use by the investigation team:
  - Notes taken about the emergency response by Emergency Response Teams.
  - Statements taken immediately after the incident from witnesses to the emergency.
  - Within 24 hours of the emergency, Emergency Response Team will investigate the root cause of the accident; identify opportunities to improve. Moreover, suggest any suitable changes in the contingency plan or procedure in light of the evaluation of the incident.

## **11.0 TRAINING:**

- 11.1 All concerned shall receive initial as well as periodic refresher training in addition to mock drills order to allow them to fulfill their responsibilities during an emergency.
- 11.2 Training needs be identified and team members should be trained to handle any situation. The training log shall be maintained and regular training in house as well as outside shall be arranged.
- 11.3 Incident Commander is responsible for ensuring that personnel receive the required training before they are expected to perform their duties, and that they also receive the refresher training at the required interval.

## **12.0 CONTINGENCY PLAN FOR FIRE:**

- 12.1 When the fire alarm sounds evacuate the affected area and gather at the assembly point
- 12.2 Incidents Commander will make sure that no employee is left behind at the affected place.
- 12.3 Fire officer will shut off sources of ignition & electricity.
- 12.4 Incident Commander will contact the Security Incharge to notify the Fire Brigade, if required.
- 12.5 The Emergency Response Team will use appropriate firefighting equipment to extinguish the fire; such as:
  - For all solids except metals, use Water Type Fire Extinguisher.
  - For those articles having Electricity/ Power, use Carbon Dioxide Fire Extinguisher.
- 12.6 Prepare and submit an Incident Report.

## **13.0 CONTINGENCY PLAN FOR EARTHQUAKE**

- 13.1 Evacuate and assemble at the assembly point
- 13.2 Provide first aid in case anyone has been injured by falling materials
- 13.3 Alert emergency services and call for ambulance in case there are many injuries

- 13.4 Ensure that all personnel working at the site especially working on heights have left their places of work
- 13.5 Shut off the electricity and fuel and water connections.
- 13.6 Remain at the assembly point till the earthquake tremors cease.
- 13.7 The site shall be inspected for damage and list prepared of damaged structures and equipment

#### **14.0 CONTINGENCY PLAN FOR BOMB THREATS:**

- 14.1 Bomb threat may be received at the Project office via telephone call
- 14.2 The person receiving the call must remain calm and try to extract as much information as possible from the caller regarding the place where the bomb is placed, the size of the bomb etc.
- 14.3 Immediately inform the Incident Commander and arrange for evacuation of personnel from the area(s)
- 14.4 Contact Bomb Disposal Squad for taking necessary action to locate the bomb
- 14.5 All personnel to return to work when the Bomb Disposal Squad clears the area.

#### **15.0 CONTINGENCY PLAN FOR MEDICAL EMERGENCIES:**

- 15.1 Any employee injured during work or due to an emergency is to be treated by first aid team and provided first aid till the arrival of ambulance.
- 15.2 In case, the injury is severe, then the person shall be sent to the nearest hospital for further treatment.
- 15.3 Incident Commander shall be notified of medical emergency at once.

#### **16.0 CONTINGENCY PLAN FOR HEAVY RAINS AND FLOODING**

- 16.1 If rains have started during the night the security in charge must inform the Project Engineer and wait for further orders
- 16.2 Steps must be taken to cover all the equipment at the project site and remove them to a safe place.
- 16.3 In case rains continue then work is not to proceed till the rains stop
- 16.4 In case of flooding at the site, all equipment is to be removed from the flooded area and kept covered
- 16.5 After the rains have stopped, assessment of damages is to be carried out and report prepared by the Incident Commander and submitted to the Project Director.

## 17.0 CONTINGENCY PLAN FOR CIVIL UNREST

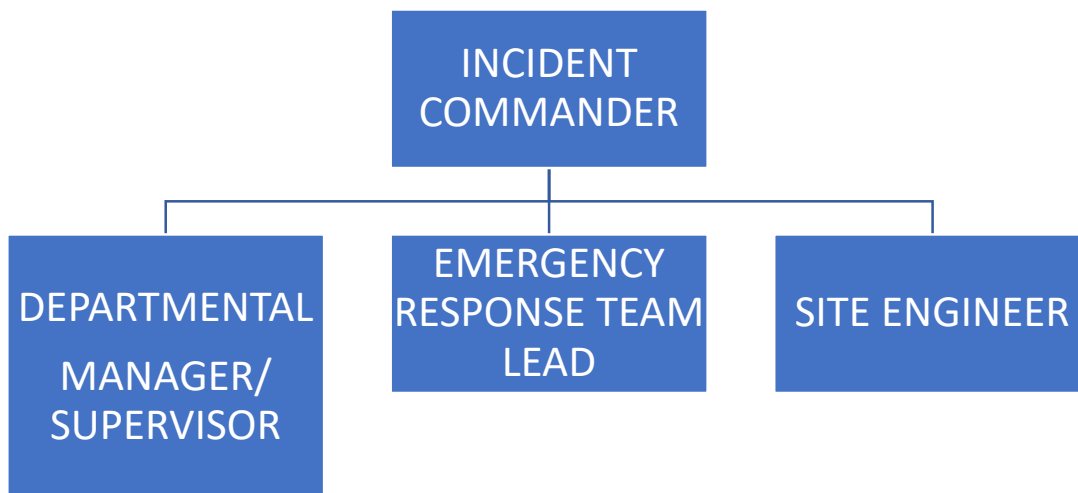
- 17.1 In case there is news of civil unrest, the Security In Charge shall ensure that all gates of the Project Site(s) are closed and secured. Rangers/Police shall be summoned.
- 17.2 No employee shall be allowed out from the site.
- 17.3 When it is ensured that there is no danger of any violent demonstrations in the vicinity of the project site, the gates may be opened and traffic in and out allowed.

### Emergency Contact Numbers

#### Karachi

Name	Number
Karachi Police	15
Fire Brigade	16
Sui Gas	1199
Traffic Police	1915
CPLC	1102
Rangers	1101
Aman Ambulance	1021
Edhi Ambulance	115
Chipa Ambulance	1020
K Electric	118

### ORGANOGRAM FOR EMERGENCY RESPONSE



## b) Personal Protective Equipment

### 1. PURPOSE

The purpose of this procedure is to ensure that Personal Protective Equipment (PPE's) are made available to all project site employees.

The key requirements of this procedure include:

- Identification of areas / tasks requiring PPE's
- Selection and issuance
- Use and maintenance
- Eye protection policy
- Foot protection policy
- Training
- Program evaluation

### 2. SCOPE

This procedure applies to KWSSIP Project Sites, where risks to health and safety cannot be adequately controlled through engineering and administrative means

### 3. RESPONSIBILITIES

The Project Manager in co-ordination with Site safety Officer will:

- Co-ordinate the overall Personal Protective Equipment program at the Project Site; and
- Prepare and update the PPE procedure;

The concerned Department Manager / Supervisor will:

- Generate list of PPE's used in his area
- Ensure that PPE is worn correctly
- Ensure that PPE is stored as per procedure
- Ensure that the correct cleaning procedures are carried out
- Inspect PPE at regular intervals
- Initiate disciplinary action if appropriate
- Ensure appropriate warning signs are posted for hazardous activities at the project site
- Maintain inventory of PPE's of his area
- Organize PPE training.



## **4. PROCEDURE**

### **4.1 Identification of Area / Task Requiring PPE**

The concerned Department Manager in co-ordination with Manager EHS / his representative will:

- Identify areas / tasks / processes for which PPE is required
- Ensure that PPE is used as last resort after all other feasible controls have been applied or as an interim measure until more effective controls can be implemented

### **4.2 Selection and Issue**

The Project Manager in co-ordination with Site Safety Officer will:

- Select appropriate PPE's as per requirement
- Ensure that only the correct PPE is issued
- Ensure that PPE is issued to personnel who know its use
- Ensure that areas where PPE's use is mandatory are demarcated as "PPE Zone" outside the area
- Ensure that signs are placed in appropriate locations to warn staff where PPE's are required.

### **4.3 Mandatory PPE for Project Site**

Helmets and Safety Shoes are to be worn at all times at the Project Site. The helmets and Safety Shoes must be checked on regular basis by the Site Supervisor to ensure they are in good condition.

Other PPE for construction sites are:

Harness, Welding Shields/Goggles, Gloves , Gum Boots, Respiratory Protective Equipment etc. These are to be worn when performing work at heights, welding activities working in wet areas.

### **4.4 Use and Maintenance**

The Project Supervisor in coordination with the Site Safety Officer will:

- Develop procedures on correct use, storage and maintenance of PPE's
- Ensure that staff require to wear PPE's must be trained on their use
- Ensure that the correct PPE has been issued to the site personnel performing tasks for which it is required and keep a record of the PPE issued to the employees.

- Ensure that the issued PPE is worn correctly
- Ensure that the PPE is properly cleaned and maintained
- Arrange regular inspections of PPE's at appropriate intervals
- Initiate disciplinary action against any person refusing to use issued PPE correctly

#### **4.5 Training**

The concerned Project Manager in co-ordination with Site safety Officer will ensure that concerned personnel receive appropriate training as per EHS training program on:

- How and why PPE was selected
- When PPE is necessary
- Which PPE is necessary
- How to put on, take off, adjust and wear the PPE properly
- The proper-care, maintenance, storage, inspection, use, replacement and disposal of the PPE

The Project Manager will retain the PPE training record with a copy to Manager EHS / his representative

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## c) Operation of Heavy Equipment and Cranes

### 1. PURPOSE

The purpose of this procedure is to ensure safety in operation of heavy equipment and overhead cranes.

### 2. SCOPE

This procedure defines the necessary precautions to be taken for operation of heavy equipment and overhead cranes

### 3. RESPONSIBILITIES

#### 4.

The Engineering Manager/Site Supervisor will ensure implementation of this procedure,

### 5. PROCEDURE

#### 4.1 Operation of Heavy Equipment

- a) All heavy equipment at site is to be checked and certificate of safety is provided by an approved testing company
- b) Vehicular emissions from the equipment are to be tested by an approved testing laboratory to ensure that they comply with the Vehicular Emissions Standards
- c) The operators of the equipment are to be duly trained and have appropriate license to operate the equipment
- d) The area where the equipment is in operation is to be kept clear and no unauthorized personnel allowed to work around that area.
- e) All the safety alarms, lights etc. are to be in working condition at all times.
- f) Faulty equipment is to be removed from service and tagged that it is not to be used.
- g) All equipment is to be regularly checked and maintained.

#### 4.2 Operation of Cranes

- a) The Project Engineer must ensure that crane operators are trained and hold a valid license to operate the crane

- b) All lifting equipment shall be checked daily to verify equipment is in safe operating condition before using. This check would include brakes, lights, horns, visibility from operator's station, and proper operation of power source for lifting. More detailed inspection of lifting equipment shall be conducted at regular intervals to maintain the equipment in a safe, operable condition. Records of conditions found and repairs made during inspections shall be maintained.
- c) Statutory requirements for annual inspections of lifting equipment shall be observed and records maintained.
- d) Safe working load chart shall be available at site and complied when lifting the loads
- e) No person shall be allowed to ride on the hook of any lifting equipment.
- f) Designated signalman shall be assigned and operation stopped in case operator is unsure of a signal or existence of a hazardous condition.
- g) Area around the crane operation shall be cordoned off and no un-authorized person allowed to work in the area.

## d) **Storage of Fuel and Other Hazardous Substances**

### 1. **PURPOSE**

The purpose of this procedure is to provide a guideline for storage of fuel and other hazardous substances

### 2. **SCOPE**

This procedure defines the necessary precautions to be taken for fuel storage and storage of other hazardous substances

### 3. **RESPONSIBILITIES**

The Engineering Manager/Site Supervisor will ensure implementation of this procedure,

### 4. **PROCEDURE**

#### **4.1 Storage of fuel**

- a) All fuel for use in generators is to be stored in above ground tanks and provided with bunding. The NFPA 30 guidelines are to be followed.
- b) Appropriate firefighting measures are to be taken in the area where the fuel tank(s) are located.
- c) If more than 5000 Liters of fuel is stored at site then a license from the explosives department is to be obtained.
- d) "FLAMMABLE" "NO SMOKING" signs to be displayed in the fuel storage area

#### **4.2 Storage of Hazardous Substances**

- a) All hazardous/flammable materials are to be stored a segregated area and provided with secondary containment.
- b) Thinner should be stored on separate pallets with secondary containment.
- c) Appropriate fire extinguishers are to be placed in the area

### 4.3 Inspection of Storage Areas

The Site Safety Officer shall carry out regular inspections of the fuel storage areas and hazardous materials storage areas

#### e) **Procedure for Waste Management**

##### **Purpose**

The purpose of this procedure is to ensure proper disposal of waste from activities conducted by or overseen by project site. In addition, this procedure outlines how to prevent discharges from dumping sites at the facility and other locations on grounds, which could cause pollutants to enter sensitive areas.

##### **Scope**

These procedures are to ensure the proper handling and legal disposal of all waste from all **locations of the project site. This program is an aide to summarize the applicable** requirements of many different waste types and regulations but should not be considered all-inclusive of every waste regulation. As new regulations are promulgated and/or other facets of waste become part of this program, updates will be made.

##### **Roles and Responsibility**

- Contractors should include storm water pollution prevention strategies in waste management procedures.
- It should be ensured that contractors implement proper Best Management Practices (BMPs) to prevent storm water pollution.

##### **Procedures**

- All waste receptacles should be leak-tight with tight-fitting lids or covers. Plastic liners can be used to ensure leak tightness.
- Keep lids on dumpsters closed at all times unless adding or removing material.
- Place waste receptacles indoors or under a roof or overhang whenever possible.
- Locate dumpsters on a flat, paved surface and, if possible, install berms or curbs around the storage area to prevent run-on and run-off.
- KWSSIP up around outdoor waste containers regularly.
- Arrange for wastes to be picked up regularly and disposed of at approved disposal facilities.
- Record Sindh Environmental Protection Agency (SEPA) approved waste disposal contractor's contact details.
- Never place hazardous materials, liquids or liquid-containing wastes in a dumpster or trash receptacle. If liquid wastes must be disposed in the trash, absorb them with kitty litter or other absorbents before disposal.
- Non-hazardous liquid waste must be disposed in the sanitary sewer (if approved) or transported to a disposal site that will accept that type of wastewater.
- Do not wash out waste containers or dumpsters outdoors unless the wastewater drains to sanitary sewer or wash containers/dumpsters in a wash bay or floor drain that goes to the sanitary sewer.

- When working in the field, place all wastes in appropriate containers near the work site. If no public containers are available, containerize or bag the wastes and bring them back the shop for proper disposal.
- Minimize waste by purchasing recyclable products that have minimal packaging. Recycle cardboard, plastics and paper products as accepted by your local recycling agency.

### **Training**

- Training on Infection Control and Waste Management shall be given to all waste handlers at project site to better manage the waste from “cradle” to “grave”.
- Training should include how to recognize and report illegal connections or discharges –annually or bi-annually

### **Record Keeping and Documentation**

- Record of forms for waste disposal should be documented.
- Keep a list of all employees trained in the project site or other location:
- Keep records on all wastes disposed of including: hazardous waste manifests, trash removal statements (bills), receipts or invoices from recyclers

## f) Procedure for Housekeeping

### **Purpose**

To provide a procedure for cleaning & sanitization all the areas within KWSSIP Project Site(s).

### **Scope**

This procedure is applicable to all sites of the facility for general cleaning and sanitization in facility premises.

### **Roles and Responsibility**

- For Operation, Housekeeper (Administration department) is responsible.

### **Procedures**

Many workplace hazards can be removed or eliminated through an effective worksite housekeeping routine. This doesn't just include a cleaning routine, but rather is an ongoing process of efficient tidying and safety practices, as following:

#### ***Maintenance of a safe work area***

Work area should be monitored at regular intervals throughout the day and clear up. If trip hazards and mess is starting to build up, it must be sorted out.

#### ***Access routes clearance***

A safe work area includes access and egress. Any materials/tools/benches etc. should not be kept in the access route in order to clear the way and to minimize any injury.

#### ***Safety in Housekeeping***

Safety is essential for every job, and housekeeping has its safety concerns. Some aspects of going over during safety training for housekeepers include:

- **Health Safety**
  - Housekeepers work with various germs throughout their day. They need to know how to properly wash their hands, use gloves, and other personal protective equipment when doing specific cleaning tasks, and dispose of trash properly.
  - Housekeepers have the potential to be exposed to blood and other various human body fluids, so they must be trained in blood-borne pathogens and know how to safely handle these types of bodily fluids in these various situations.
- **Fire Safety**
  - In every job, all employees need to know what to do in case a fire occurs in the workplace. Housekeepers must be trained and know what is expected of them to do in case of a fire.

### **Training**

Employees should be trained to properly manage and handle the following:

- Equipment
- Proper Use of Chemicals
- Maintenance



- Laundry and Various Housekeeping Duties
- Safety

### **Record Keeping and Documentation**

Records to be maintained at construction sites play important role in construction activities. It is a document required to prove any construction activity has taken place at site during billing or any other claims. These records have all the data of various construction activities carried out at site.

- First and foremost, important records to be maintained on site are the working drawings approved by the clients and design engineer, based on which all the construction activities take place on site.
- Time and Progress Charts help in tracking the construction activities from time to time and help in effective planning, scheduling and controlling the construction projects activities. These charts need to be approved from the concerned authorities.
- All the orders given by clients to the contractor's need be maintained with serial numbers, signatures and dates as a work orders book.
- Works diary of a construction project should indicate contract agreement number, name of work, amount of contract, date of commencement of work, date of completion and extension time granted. All the relevant details need be entered daily in the works diary. This diary serves as an authentic record. Following details need to be entered in this diary with due care:
  - Weather at site
  - Important materials brought to site with their approximate quantity
  - Types of transport working at site
  - Types of tools and plants being used at site
  - Important items of works completed and passed on the particular date
  - Visits of VIPs and their remarks if any.
- Following records must also be maintained:
  - Labor Attendance Record and Daily Wages Sheet
  - Tests Results Record
  - Records of Changes, Deviation Orders and Amendments
  - Periodic bills records

## g) Monthly Reporting Procedure

### Purpose

This procedure gives recording and reporting guidelines at workplace to report the injuries at facility, recovery progress, and compliance.

### Scope

This guideline is applicable to all works working in the premises of project site. Following aspects are to be reported under scope of this guidance:

- work-related accidents
- specified injuries to workers
- work-related accidents which cause death;
- work-related accidents which cause certain serious injuries (reportable injuries);
- diagnosed cases of certain industrial diseases; and
- certain 'dangerous occurrences' (incidents with the potential to cause harm)

### Responsibility

- It is the responsibility of each individual to report all work-related injuries and/or work-related illnesses immediately to his/her supervisor (no exceptions).
- Project Managers are required to maintain a record of information regarding every reported work-related injury and/or illness on the work-related injury/illness log
- Project Managers are responsible for knowing how to report a work-related Injury or Illness and completing a supervisor's incident/injury report.
- It is the responsibility of the injured/ill individual to submit all work-related documentation provided by a health care provider to their supervisor or facility manager.
- The Project Managers is required to submit a supervisor's incident/injury report for each work-related injury/illness to Project Director and to the regulatory body i.e., Labor Department. Report should be made on the prescribed forms within 24 hours.

### Procedure

#### **Online Reporting**

The appropriate online report form can be appropriately filled and the form will then be submitted directly to the Health, Safety and Environment office or the manager of database. A copy for records must be maintained for documentation.

#### **Telephonic Reporting**

All incidents can be also be reported online but a telephone service is also an option for reporting fatal and specified injuries only.

#### **Reporting out of hours**

- Project Manager has an out-of-hours duty officer. Circumstances where Project Manager may need to respond out of hours include:
  - a work-related death or situation where there is a strong likelihood of death following an incident at, or connected with, work;

- a serious accident at a workplace so that Project Manager can gather details of physical evidence that would be lost with time; and
- following a major incident at a workplace where the severity of the incident, or the degree of public concern, requires an immediate public statement from either Project Manager or government ministers.

### **Recordkeeping and Maintenance**

Project Manager must keep a record of:

- any accident, occupational disease or dangerous occurrence which requires reporting; and
- any other occupational accident-causing injuries that result in a worker being away from work.

## h) **Camp Management Procedure**

### **Purpose**

The purpose of the plan is to define the actions to manage the workers' onsite accommodation during the construction activities during the KWSSIP Project.

### **Scope**

These guidelines are applicable for health and safety management at the campsite.

### **Roles and Responsibilities**

Principal roles and responsibilities for the implementation of this plan are outlined below:

#### ***Construction Contractor & Subcontractors***

- Construction Contractor has to ensure sufficient and qualified resources are allocated on an ongoing basis to achieve effective implementation of this Management Plan. Camp Manager(s) will be appointed in order to manage all workers' issues related to the accommodation.
- Construction Contractor have to ensure the effective implementation of this plan by issuing its own procedures addressing, detailing and customizing specific actions, measures and monitoring activities .
- Contractor's responsibility. The Contractor procedures have to include a description of allocated resources, responsibilities and communication procedures to relevant personnel.

### **Procedure**

#### ***Management***

Careful planning and a concern for health, safety and the environment are essential for good project management. Field camps or rented accommodations should provide adequate working, eating and sleeping arrangements for field personnel and should be appropriately equipped to encourage employees to work safely and efficiently. At the same time, camps should make as little impact as possible on the environment.

Project managers have to allow sufficient time to secure the required permits and permissions before sites are opened. The following factors are to be considered:

- Time of residence: Will the camp be in operation for a field season or year-round?
- Duration: Temporary or a permanent establishment
- Size of the camp (at each time of year)
- Accessibility: Transportation access (vehicle, helicopter and fixed wing) may impact the site selection
- Required permits

#### ***Audit and Review***

The correct implementation of this Management Plan is verified through internal inspections and audits carried out according to the requirements of the company. The schedule, the frequency, the scope and objectives of the audit as well as the responsible internal auditors are indicated in the Audit Program that is developed and updated by Project Department.

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**Internal auditing will address:**

- The correct implementation of this Management Plan;
- The correct development and implementation of Construction Contractor's Procedures;
- The correct and timely implementation of an auditing and review system by the EPC Contractor.

***Reporting***

Evidences of the implementation of the mitigation actions/measures and related results are collected through inspection and auditing activities. Reporting activities for this management plan is mainly related to:

- Main figures regarding the implementation of Worker's accommodation
- Main figures regarding undesired camp issues
- Collection, aggregation and recording of the data

***Training***

It should be ensured that employees are trained to do their jobs safely. Training must be related to operating the campsite.

***First aid***

Make sure that all first aid kits per the requirements of the OSH Act 2017 and OSH Rules 2019 and are replenished as needed. Make sure additional appropriate first aid is available at all times including stretcher(s).

***Maintenance***

A maintenance schedule should be established for the camp and equipment that includes regular inspections of all generators, pumps, hoses and fittings and other mechanized equipment, including all means of transportation. Maintenance schedules should be followed for water treatment and sewage treatment systems.

***Documentation***

Records should be maintained for inspections, training, first aid, safety meetings, and equipment maintenance records and communications logs.

***Forms***

Adequate supply of forms should be made for reporting incidents/accidents, such as required by the jurisdictional Workers' Compensation Board, spill reports, inspection and audit forms, maintenance check forms, etc.

***Training***

Training should be different on multiple stages, as following:

- Health and Safety During Staff Orientation
- Training During the Camp Season

During training, following aspects must be considered:

- Administration and Operations

- Health, Safety, and Risk Management
- Behavior Management

## i) **Management of Food and Drinking Water at Campsite(s) and at Construction Site**

### **Purpose**

This guidance provides procedures for balanced, healthy and nutritional meals for field employees. Food-borne illness can, however, KWSSIP through a camp and disable many people at one time. Therefore, hygienic food preparation and handling procedures and safe food storage are critical to maintaining employee health.

### **Scope**

These guidelines are applicable for healthy food and safe drinking water at the campsite and at construction site.

### **Procedure for Food Safety**

#### ***Food Preparation Safety***

- Cross contamination is one of the most common causes of food-borne illness and occurs when bacteria from raw food (especially meat and poultry) is spread to other foods.
- Cooked food should be stored in freezer if required to be kept for more than four days.
- Use potable (drinking) water only to wash salad greens, fruits, vegetables and any food that will be consumed raw. It is advisable to wash pre-washed produce.
- If possible, use a designated cutting board for meat, poultry and seafood, and a separate board for vegetables and fruits. This way, raw fruits and vegetables will not be accidentally contaminated by raw meats etc. Wash cutting boards with hot soapy water and sanitizing solution after use. Keep raw meat, poultry and seafood separate from all other foods. Store them on the bottom shelf of a refrigerator. Then, leaking packages will not drip onto other foods.
- In case raw meat is to be stored for more than a week then it should must be stored in freezers.
- Wash foods in a bowl, not in a water-filled sink. After washing meat, chicken, or fish, always wash the sink as well as the container, as splashed water may contain contaminating bacteria.
- When cooking meats, poultry or seafood on a grill, place the cooked food in a clean container. Discard marinades after raw items are removed.

#### ***Food storage tips***

- Food handlers should unpack and inspect all food shipments for quality immediately after it arrives. Inspect for quality, freshness, and potential contamination including by vermin.
- After inspection, store it promptly for maximum safety. Proper storage includes both preservation of food quality by refrigeration and prevention of invasion by nuisance animals and insects. Never store food in sleeping tents.
- Store perishable goods in appropriate places – cupboards, refrigerators or freezers.
- Store heavy and bulky items on lower shelves but not necessarily the lowest shelf. Store foods in containers that are insect proof, rodent proof and bear proof, as required. Label the contents.

### *Animal and Insect Controls*

Vermin include rats, mice, cockroaches, bedbugs, flies and other noxious animals or insects. Construct camp buildings to exclude vermin as best possible. Adequate steps are to be taken to keep the premises free of vermin and insects by using appropriate fly screens, traps and baits insect sprays.

### **Housekeeping**

- Set up the cooking area separate from the sleeping area. The space between these locations should be open with clear visibility if bears are a risk.
- Restrict food to the kitchen and dining areas; no food should be permitted in sleeping or work areas to control vermin (or bears).
- Set up hand washing facilities so workers can wash before meals. Workers should not wear dirty work clothes and boots in the kitchen and eating areas.
- Projects should have a policy stating that employees must not feed wildlife. Feeding wildlife encourages animals to become human habituated and food conditioned. Some carry life-threatening diseases such as rabies and plague.
- Camps should have an emergency lighting system in the kitchen area in the event of a power failure.

### **Health Surveillance of Kitchen Staff**

- Kitchen staff must report to supervisor if they are suffering from fever, cold or diarrhea and they should not be allowed to work
- Annual health surveillance of kitchen staff is to be carried out and they are vaccinated against hepatitis, COVID 19, cholera etc.

### **Procedure for Drinking Water Safety**

The primary risks associated with drinking water are disease-bearing organisms, turbidity and the presence of toxic chemicals or sewage that may contaminate drinking water. These are worldwide issues, and water in any locality and in any climate or terrain may be affected by one or more of these factors.

Determine the quantity of drinking water required for the camp. Consider the factors:

- whether the camp is temporary or permanent,
- number of employees,
- the season,
- type of activities at the Project Site
- existing and future requirements (showers, clothes washers, stoves, refrigerators, freezers) of the camp or project.



## j) Project Site Security Procedure

### Purpose

To detail the General Security Requirements and Procedures for persons entering the site and to manage the onsite security to prevent any harm to employees and overall management.

### Scope

Site Security Team ensures a high level of awareness for security measures implemented for general site access and for the facility amongst all staff is of critical importance not only for the safety of project staff and equipment at site. Measures to prevent any terrorist activities are to be ensured at all times.

### Roles and Responsibility

Site Security Team ensures the followings:

- Local government and site policy requirements for the handling of controlled substances;
- Prohibition of use of arms at site except for the authorized security staff
- Prohibition of use of alcohol and drugs at site
- Prohibition of smoking at site except in designated smoking areas
- Prohibition of any violent behavior at site by the employees
- Compliance with site security guidelines of KWSSIP
- Control of access to areas where contamination may result from unauthorized or untrained entry;
- Control of access to areas containing Hazardous Chemicals;
- Control and access to areas where project related documentation and other records are stored as well to equipment storage areas.

### Procedures and Rules

- Site Entry Rules
  - The following business rules apply for access to the facility:
  - Entry into the facility premises is 'Restricted' to site employees and/or Approved contractors.
  - All visitors to site are to be provided with Induction Training including emergency procedures and fire assembly point,
  - Visitors and un-approved contractors are 'Not' permitted entry into the site building unless accompanied by a permanent staff member.
  - It is the responsibility of the hosting site staff member to remain with the visitors or contractors for the duration of their visit, whilst inside the project site.
- Security Guard
  - The Security Guard must verify identity of the visitor and receive approval form the site authorities before allowing access
  - Security Guard accompanies the person into and out of the site for the emergency or to retrieve any personal belongings
- Multiple Duty Shifts

- Site security policy is that any person remaining at the project site in all shifts must report his presence at the site to the Project Manager.
- Overtime
  - Work staff may work overtime only at defined shift timings.
- Terminated Employees
  - Managers must ensure that the ID badge and any facility keys held by the terminated employee are collected and returned to the Security Management team before the employee leaves the site.
- Contractors and Visitors
  - All visitors and contractors must produce photo identification and be signed into the site visitor's book at the security gatehouse.
  - Visitors and contractors will be issued a visitors' badge and must display the badge at all times, whilst on the site.
  - Security will ask visitors / contractors to wait at the Security or Reception area for collection by the nominated site contact person before continuing on inside the site.
- Building Alarms and Security Lighting
  - The Manufacturing Building is protected by alarm systems.
  - Defective external building lighting and essential walkway / corridor lighting should be reported immediately and not be isolated for any reason without prior consultation with the Facilities Manager.
- Fire and Security Surveillance Schedules
  - At all times and especially when the site is un-occupied or during the evenings
  - Security Officers on duty are required to visually inspect / check defined patrol areas.
  - The areas are defined by the patrol electronic button system to enable reporting of patrols to the security management team.
  - The inspection / patrol should check for:
    - Ensure that there are no signs of fire present in the building;
    - Ensure that all entry, exit and emergency exit doors are secure;
    - Check for signs of forced entry or fraudulent activity.
  - If a Fire is detected, the Security Guards are to initiate emergency procedures immediately.
- Parking of Vehicles
  - Vehicles should be parked only at the defined area of parking.
  - The guard should help the employees in proper parking in ready to move position.
- Monitoring the exit of employees
  - The guard should monitor the exit of employees at end of the day's work and keep a check that all employees are mentioning the correct exit time.
  - Ensure that the main gate is locked after everyone has left the premises.
  - The extension phone is put on the cradle for charging overnight.

## Training

Listed below are suggested mandatory trainings for applicable staff functions:

- Data Security, Privacy and Confidentiality
- Interaction with regulatory authorities and lending authorities viz World Bank and AIIB personnel
- Emergency Response Plan

### **Record Keeping and Documentation**

It is the responsibility of the Project Manager to ensure trainings are completed and logs archived. These trainings will be recorded and kept in the project file and employment history and will be made available for audit purposes at any time.

## k) COVID 19 Measures Procedure

### **Purpose**

This procedure is intended for planning purposes. Employers and workers should use this planning guidance to help identify risk levels in workplace settings and to determine any appropriate control measures to implement. Additional guidance may be needed as COVID-19 outbreak conditions change, including as new information about the virus, its transmission, and impacts, becomes available.

### **Scope**

This planning guidance for COVID-19 based on traditional infection prevention and industrial hygiene practices. It focuses on the need for employers to implement engineering, administrative, and work practice controls and personal protective equipment (PPE), as well as considerations for doing so.

### **Procedure**

#### *Develop an Infectious Disease Preparedness and Response Plan*

- Follow federal and state, local, tribal, and/or territorial recommendations regarding development of contingency plans for situations that may arise as a result of outbreaks
- Plans should consider and address the level(s) of risk associated with various worksites and job tasks workers perform at those sites. Such considerations may include:
  - Where, how, and to what sources of SARS-CoV-2 might workers be exposed
  - Non-occupational risk factors at home and in community Settings
  - Workers' individual risk factors (e.g., older age; presence of chronic medical conditions, including immune compromising conditions; pregnancy).
  - Controls necessary to address those risk

#### *Prepare to Implement Basic Infection Prevention Measures*

- For most employers, protecting workers will depend on emphasizing basic infection prevention measures. As appropriate, all employers should implement good hygiene and infection control practices, including:
  - Promote frequent and thorough hand washing, including by providing workers, customers, and worksite visitors with a place to wash their hands. If soap and running water are not immediately available, provide alcohol-based hand rubs containing at least 60% alcohol.
  - Encourage workers to stay home if they are sick.
  - Encourage respiratory etiquette, including covering coughs and sneezes.

#### *Develop Policies and Procedures for Prompt Identification and Isolation of Sick People*

- Prompt identification and isolation of potentially infectious individuals is a critical step in protecting workers, customers, visitors, and others at a worksite.
- Employers should inform and encourage employees to self-monitor for signs and symptoms of COVID-19 if they suspect possible exposure.

- Employers should develop policies and procedures for employees to report when they are sick or experiencing symptoms of COVID-19

#### *Develop, Implement, and Communicate about Workplace Flexibilities and Protections*

- Actively encourage sick employees to stay home. Ensure that sick leave policies are flexible and consistent with public health guidance and that employees are aware of these policies.
- Talk with companies that provide your business with contract or temporary employees about the importance of sick employees staying home and encourage them to develop non-punitive leave policies.
- Maintain flexible policies that permit employees to stay home to care for a sick family member.

#### *Implement Workplace Controls*

Occupational safety and health professionals use a framework called the “hierarchy of controls” to select ways of controlling workplace hazards. In other words, the best way to control a hazard is to systematically remove it from the workplace, rather than relying on workers to reduce their exposure.

- Engineering Controls
- Administrative Controls
- Safe Work Practices
- Personal Protective Equipment (PPE)
- Follow existing National Command and Operation Center (NCOC) Guidelines

#### *Food Preparation and Handling at Work Premises*

- Food handlers should wear masks and gloves during food preparation and handling activities.
- Food handlers must wash their hands prior to glove use and after gloves are removed. The gloves must be replaced and hands washed, after any suspected contamination including sneezing, touching the face, or contact with frequently touched surfaces.
- Food handlers who are sick or develop symptoms of COVID-19 should be granted sick leave
- Food should be protected from contamination at all times e.g., using guards or coverings for food and utensils.
- Clean and sanitize all utensils and equipment regularly

### **Roles and Responsibility**

Following initiative and responsibilities should be managed by team leader:

- Establishing a Safety and Health Program
- Compliance Assistance Specialists
- On-Site Safety and Health Consultation Services
- Cooperative Programs
- Strategic Partnerships and Alliances
- Voluntary Protection Programs (VPP)

### **Training**

All employees must be imparted training on the following:

- Signs, symptoms and modes of transmission of COVID-19
- General hygiene
- Reporting procedure for illness
- Personal and workplace cleaning and disinfection procedures
- Use of face masks (including cloth face covers)
- Maintenance of social distancing (Including use of technology to promote social distancing e.g., telework and virtual meetings)
- Proper use of PPE
- Safe work practices
- Stress management

### **Recordkeeping and Maintenance**

COVID-19 can be a recordable illness if a worker is infected as a result of performing their work-related duties. However, employers are only responsible for recording cases of COVID-19 if all of the following are true:

- The case is a confirmed case of COVID-19;
- The case is work-related; and
- The case involves one or more of the general recording criteria e.g., medical treatment beyond first aid, days away from work.

## 1) Procedure for External Visits

### **Purpose**

The purpose of this procedure is to ensure that visits by regulatory authorities and lending agencies are conducted with due protocols.

### **SCOPE**

This procedure is applicable for visits by external agencies to all KWSSIP Project Sites.

### **RESPONSIBILITIES**

The Project Manager will be responsible for overall coordination of visit to the Project Site(s) by regulatory agencies – Labor Department, Environmental Protection Agency and lending agencies – World Bank and Asian Infrastructure Investment Bank.

### **PROCEDURE**

#### SCHEDULED VISITS

##### Visit /Audits by World Bank

- a) World Bank auditors conduct visits of Project Site(s) to check that the project is being managed in compliance with the requirements of the World Bank Environmental and Social Framework and related Standards.
- b) The Project Manager must ensure that all necessary documentation is available and up to date at the Project Site.
- c) The observations by the World Bank auditors are to be noted and action plans prepared on receipt of the audit report.

##### Visit by Regulatory Agencies

- a) Such visits may be scheduled or impromptu or visit after receipt of accident report.
- b) The Project Manager must meet the regulatory agency personnel or delegate a supervisor to conduct the visit.
- c) All required documentation must be shared with the regulatory personnel.
- d) The observations made during the visit are to be noted and compliance ensured on receipt of the report.
- e) Compliance report shall be prepared and sent to the concerned regulatory agency.

## m) Procedure for Internal Audits

### Purpose

The purpose of this procedure is to have a defined procedure in place for conducting EHS Audits (inspections, Self-Audits) as per agreed schedule against the Labor Management Plan, Local Regulatory Requirements, and World Bank Standard ESS2 and Guidance Note

### SCOPE

This procedure is applicable to all KWSSIP Project Sites.

### RESPONSIBILITIES

The Project Manager will be responsible for overall coordination of KWSSIP audits at Project Sites. The Project Manager will be responsible of issuing internal audit report within two weeks of the audit followed by the audit action plan within one month of the audit to all concerned. The internal audit report compliance status will be discussed in the Site Monthly Project Committee Meetings.

Department Manager / Supervisor will be responsible for carrying out H&S Audit of their respective areas quarterly (attachment 03). The findings of inspections will be discussed in the Monthly Project Committee Meeting.

### PROCEDURE

#### 1.1 AUDIT SCHEDULE

- Internal H&S Audits of the Project Sites are to be conducted quarterly as per internal audit schedule.
- The audit schedule will be approved by the Director Projects & and a copy is to be distributed to all concerned.

#### 1.2 AUDIT TEAM

Following will be the internal audit team members at respective Sites:

- Project Manager/ Supervisor
- Engineering Manager /Supervisor
- Site Safety Officer
- Occupational Health Physician / Technician (if required)

#### 1.3 EHS INSPECTIONS

- Department/Area inspections will be carried out by the Project Supervisor using the checklist (attachment 03) every week. The purpose is to evaluate the physical H&S conditions / requirements at the workplace.

#### 1.4 AUDIT INITIATION



The internal EHS audit schedule will be conveyed one week prior to the audit to the concerned personnel.

**INTERNAL H&S AUDIT REPORT**

**Area:**

<b>S #</b>	<b>Observation</b>	<b>Recommendations</b>

**INTERNAL H & S AUDIT ACTION PLAN**

S #	Recommendation	Action Required	Action By	Target Date	Status / Comments

Department / Area : \_\_\_\_\_ Date of Inspection: \_\_\_\_\_ Conducted by: \_\_\_\_\_

Note: Area inspections to be carried out every week

**PROJECT SELF- INSPECTION REPORT**

<b>S #</b>	<b>Description</b>	<b>Observation / Action Required</b>	<b>Responsibility</b>	<b>Target Date</b>	<b>Comments</b>
1.	<b>General House-keeping</b> Area / Dust				
2.	<b>Flooring</b> Surface Condition				
3.	<b>Ventilation</b> Air Conditioning				
4.	<b>Lighting</b> Mounting Bulbs & Shades				
5.	<b>Electrical</b> Switch Boards / Wiring				
6.	<b>Work Station</b> Table, Chair, Stools, Platforms				

S #	Description	Observation / Action Required	Responsibility	Target Date	Comments
7.	<b>Machinery / Equipment</b> Positioning / Guarding/Condition				
8.	<b>Waste Management</b> Disposal Procedure / Record				
9.	<b>First - Aid</b> First-aid Box Items, Eye-Wash Station Record				
10.	<b>Personal Protective Equipment</b> Required PPE's in Use/condition				
11.	<b>Accident / Incident and Near Miss</b>  Reporting and Records				
12.	<b>Lifting Devices</b> Cranes, Pallet Trolleys, Fork Lifters etc.				

S #	Description	Observation / Action Required	Responsibility	Target Date	Comments
13.	<b>Ladders &amp; Platforms</b> Condition				
14.	<b>Material Storage</b> Fuel Storage, Other materials storage areas				
15.	<b>Emergency Exits/ Assembly Point</b> Exit Passage				
16.	<b>Safety Signboards</b> Displayed in areas				
17.	<b>Fire Extinguishers</b> Checked				

**General Remarks**