

Initial Environmental Examination

Project Number: 51036-002
August 2021

Pakistan: Khyber Pakhtunkhwa Cities Improvement Project

Development of Salhad Park (Abbottabad)

Prepared by Project Management Unit, Local Government, Elections and Rural Development Department, Government of Khyber Pakhtunkhwa for the Asian Development Bank.

This initial environmental examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "[terms of use](#)" section on ADB's website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.



GOVERNMENT OF KHYBER PAKHTUNKHWA

PROJECT MANAGEMENT UNIT

KHYBER PAKHTUNKHWA CITIES IMPROVEMENT PROJECT LOCAL GOVERNMENT, ELECTIONS & RURAL DEVELOPMENT DEPARTMENT, PESHAWAR



Ground Floor, Afzal Apartments, Jamrud Road, Phase-3 Chowk, Hayatabad Peshawar,
 +92 91 5854555 pdkpcip@gmail.com

No: LGE&RD/KPCIP/2021/712-713

Dated: 24 August 2021

To:

Mr. Kiyoshi O. Nakamitsu

Principal Urban Development Specialist
 CWRD, ADB, 6 ADB Avenue, Mandaluyong City
 1550 Metro Manila, Philippines
 Tel: +63-2-632-4444

Manila, Philippines.

Subject: **51036-002-PAK: KHYBER PAKHTUNKHWA CITIES IMPROVEMENT PROJECT**
- ENDORSEMENT OF ENVIRONMENT AND SOCIAL SAFEGUARDS DOCUMENTS

Dear Mr. Kiyoshi,

This is to confirm our endorsement of the following documents and their disclosure:

- Environmental Impact Assessment: Abbottabad Solid Waste Management Facility Development
- Environmental Impact Assessment: Mardan Solid Waste Management Facility Development
- Environmental Impact Assessment: Mingora Solid Waste Management Facility Development
- Environmental Impact Assessment: Peshawar Solid Waste Management Facility Development
- Initial Environmental Examination: Extension of JICA Water Treatment Plant and Gravity Water Supply Scheme (Abbottabad)
- Initial Environmental Examination: Construction and Improvement of Sewage Treatment System at Kohat Development Authority Township, Kohat
- Initial Environmental Examination: Construction of Roria Sewage Treatment Plant and Revamping of Sewerage System in Mardan
- Initial Environmental Examination: Kohat Solid Waste Management Facility
- Initial Environmental Examination: Improvement of Water Supply System Kohat
- Initial Environmental Examination: Salhad Park Abbottabad
- Initial Environmental Examination: Water Supply Scheme, Mingora
- Initial Environmental Examination: Improvement of Water Supply System Peshawar
- Social Due Diligence Report
- Land Acquisition and Resettlement Framework
- Land Acquisition and Resettlement Plan: Landfill Site in Abbottabad
- Land Acquisition and Resettlement Plan: Landfill Site in Kohat
- Land Acquisition and Resettlement Plan: Access Route to Landfill Site in Mingora
- Land Acquisition and Resettlement Plan: Greater Water Supply Scheme Mingora
- Land Acquisition and Resettlement Plan and Environmental Safeguard Documents: Pedestrianization of Abbottabad Old City
- Corrective Action Plan: Chuna Water Supply, Abbottabad
- Corrective Action Plan: Integrated Solid Waste Management System & Landfill Site Mingora
- Corrective Action Plan: Integrated Solid Waste Management System & Landfill Site Peshawar
- Environmental Management Plan
- Resettlement Plan
- Due Diligence Report for Use of ADB Funds for Land Acquisition and Resettlement

We are committed to their full implementation in compliance with the requirements of ADB SPS (2009) Policy, please

(VASIF SHINWARI)

PROJECT DIRECTOR
 PMU, KPCIP, LGE&RDD, Peshawar

Copy to:

- PS to Secretary LGE&RDD – for information

CURRENCY EQUIVALENTS

As of 9 August 2021 Pak Rs 1.00 = \$ 0.00658	Currency Unit – Pak Rupees (Pak Rs.) US\$1.00 = Pak Rs. 160
---	--

CONVERSIONS

1 meter = 3.28 feet
1 hectare = 2.47 acre

ACRONYMS

ADA	Abbottabad Development Authority
ADB	Asian Development Bank
AIP	Access to Information Policy
BC	Before Construction
BOQ	Bill of Quantities
CORDEX	Coordinated Regional Downscaling Experiment
COVID-19	Corona Virus Infectious Disease-2019
CSC	Construction Supervision Consultant
DC	During Construction
DO	During Operation
EA	Executing Agency
EDCM	Engineering Design Construction Management
EGL	Existing Ground Level
EHS	Environmental, Health, and Safety
EIA	Environment Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
GoP	Government of Pakistan
GRM	Grievance Redress Mechanism
IA	Implementing Agency
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
KP	Khyber Pakhtunkhwa
KPCIP	Khyber Pakhtunkhwa Cities Improvement Project
KP-EPA	Khyber Pakhtunkhwa Environmental Protection Agency
LAA	Land Acquisition Act (of 1984)
LARP	Land Acquisition and Resettlement Plan
Lea	Equivalent sound pressure level
LGERDD	Local Government, Elections and Rural Development Department
NCS	National Conservation Strategy
NEP	National Environmental Policy
NEQS	National Environmental Quality Standards
OHS	Occupational Health and Safety
O&M	Operation & Maintenance
PAP	Project Affected Persons
PC	Public consultation

PCC	Plain Cement Concrete
PDD	Planning & Development Department
PEP Act	Pakistan Environment Protection Act 1997
PEPC	Pakistan Environmental Protection Council
PGA	Peak Ground Acceleration
PMU	Project Management Unit
PPE	Personal Protective Equipment
RCC	Reinforced Cement Concrete
REA	Rapid Environmental Assessment
RFP	Request for Proposal
RP	Resettlement Plan
SOPs	Standard Operating Procedures
SPS	Safeguard Policy Statement
SSEMP	Site Specific Environmental Management Plan
TMA	Tehsil Municipal Administration
TMP	Traffic Management Plan
USEPA	United States Environmental Protection Agency
WHO	World Health Organization
WSSC	Water and Sanitation Services Company
WSSCA	Water and Sanitation Services Company Abbottabad

NOTE

In this report, “\$” refers to US dollars

DEFINITION OF TERMS

“Ground Water”: The supply of fresh water found beneath the Earth's surface, usually in aquifers, which supply wells and springs.

“Laws”: means state and local laws and all regulations, rules, orders, decrees, decisions, instructions, requirements, policies and guidance which are issued or made by any Relevant Authority and which are legally binding, as any of them may be amended from time to time.

“Personal Protective Equipment” (also PPE): Clothing and equipment worn by pesticide mixers, loaders, applicators, and re-entry workers, hazmat emergency responders, which is worn to reduce their exposure to potentially hazardous chemicals and other pollutants.

“Peak Ground Acceleration” (PGA) is a measure of earthquake acceleration on the ground and an important input parameter for earthquake engineering.

“Risk Assessment”: Qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

CONTENT DETAILS

S/No.	Version	Date	Summary of Revisions made
1	1	9-8-21	First Draft of IEE report

TABLE OF CONTENTS

EXECUTIVE SUMMARY	i
1 Introduction	1
1.1 Overview	1
1.2 Project Location	2
1.3 Objective of IEE	2
1.4 Environmental Category of Project	2
1.5 Methodology of IEE Study	3
1.5.1 Understanding of the Proposed Operation	3
1.5.2 Review of Legislation and Guidelines	3
1.5.3 Secondary Data Collection	3
1.5.4 Field Data Collection (Baseline Survey)	3
1.5.5 Public Consultation	4
1.5.6 Impact Identification and Assessment	4
1.5.7 Recommendations for Mitigation Measures	4
1.5.8 Development of Environmental Management Plan (EMP)	4
1.6 Proponent of Project	4
1.7 Structure of the Report	5
1.8 IEE Team	5
1.9 Further Additions & Updating of IEE Study	6
2 Policy and Legal Framework	9
2.1 General	9
2.2 National Policy and Legal Framework	9
2.3 Regulations for Environmental Assessment, Pakistan EPA	9
2.4 Regulatory Clearances, KP EPA	9
2.5 Guidelines for Environmental Assessment, Pakistan EPA	9
2.6 National Environmental Quality Standards (NEQS) 2000 & 2010	10
2.7 Other Environment Related Legislations	10
2.8 Implications of national policies and regulations on proposed project	12
2.9 ADB's Safeguard Policy Statement (SPS), 2009	13
2.10 ADB's Access to Information Policy (AIP) 2018	14
2.11 ADB's Accountability Mechanism Policy 2012	14
2.12 Implications of ADB's safeguard policies on proposed project	14
2.13 Comparison of International and Local Environmental Legislations	16
3 Project Description	21
3.1 Project Introduction	21
3.1.1 Project Need	21
3.1.2 Project Scope and Objectives	21
3.2 Design Methodology and Approach	22
3.2.1 Detailed Design	22
3.3 Site Remediation	25
3.4 Scope of Construction Works	27
3.4.1 Construction Phase Details	29
3.4.2 Operation Phase Details	37
3.5 Climate Risks of Project	37
3.5.1 Climate Change Trends and Extremes in Abbottabad	37
3.5.2 Climate Risk and Vulnerability Assessment	39
3.5.3 Climate Change Mitigation and Adaptation Measures	39
4 Description of Environment	40
4.1 Physical Environment	40
4.1.1 Topography	40

4.1.2	Soils	40
4.1.3	Seismicity	41
4.1.4	Climate	43
4.1.5	Land Use	49
4.1.6	Surface water	55
4.1.7	Groundwater	55
4.1.8	Noise	55
4.1.9	Air Quality	56
4.2	Ecological Environment	59
4.2.1	Biological Environment	59
4.2.2	Protected areas/Critical Habitats	59
4.2.3	Flora	59
4.2.4	Fauna	60
4.2.5	Aquatic Life of the Project region	62
4.2.6	Endangered Species of the Project Region	62
4.2.7	Tree Cutting	62
4.3	Socio-economic Environment	63
4.3.1	Administrative Setup	63
4.3.2	Demography and Population	63
4.3.3	Religion	63
4.3.4	Archaeological and Cultural Site	63
4.3.5	Ethnicity in the Project Area	64
4.3.6	Language and Dialects	64
4.3.7	Dwellings	64
4.3.8	Economics of Abbottabad	64
4.3.9	Education Facilities in Project area	64
4.3.10	Social Amenities in the project area	64
4.3.11	Major Source of Drinking Water	65
4.4	Findings of Social Due Diligence	65
4.5	Sensitive Receptor Mapping	65
5	Analysis of Alternatives	67
5.1	Overview	67
5.2	No project Option	67
5.3	Site Selection	67
5.4	Site Remediation options	68
6	Potential Environmental Impacts and Mitigation Measures	69
6.1	Methodology for impact screening	69
6.2	Design/Pre-Construction Phase	70
6.2.1	Unsuitable locations for disposal of solid waste dumped on site as part of site remediation	72
6.2.2	Insufficient site investigations leading to incomplete site remediation	72
6.2.3	Inadequate designing of leachate and landfill gas piping systems leading to risks to settlements in project area	72
6.2.4	Lack of integration of IEE/EMP requirements into Construction bid documents	73
6.2.5	Improper Material Haul Routes	73
6.2.6	Limited Contractor's Environmental Safeguards Capacity	73
6.2.7	Improper locations for Labor Camps and ancillary facilities	74
6.2.8	Cultural Heritage & Religious Sites	74
6.2.9	Land Acquisition and Resettlement Impacts	75
6.2.10	Impacts due to Natural hazards	75

6.2.11	Impacts due to existing facilities	76
6.3	Construction Phase	76
6.3.1	Degradation of Ambient Air Quality	77
6.3.2	High Noise Levels	81
6.3.3	Impacts on surface water quality of Salhad Nullah	84
6.3.4	Potential Accidents and injuries to communities in project area	85
6.3.5	Occupational Health and Safety (OHS)	86
6.3.6	Hazardous and Non-Hazardous Waste Management	94
6.3.7	Camp & Batching Plant Effluent	95
6.3.8	Soil Contamination	96
6.3.9	Employment Conflicts	97
6.3.10	Communicable diseases incl. COVID-19	97
6.3.11	Construction of Administration Building and Other Infrastructure	102
6.3.12	Site restoration	103
6.3.13	Vegetation and Wildlife Loss	104
6.3.14	Historical/Archaeological Sites	104
6.4	Operation Phase	105
6.4.1	Generation of solid waste	105
6.4.2	Leachate collection and management system and methane gas collection and ventilation system	107
6.4.3	Creation of job opportunities	107
6.4.4	Improved aesthetics and public health in area due to site remediation and removal of odor and disease vectors	108
6.4.5	Prevention of contamination of Salhad Nullah from dumped waste	108
6.5	Cumulative Impacts	108
6.6	Indirect and Induced Impacts	109
7	Environmental Management Plan & Institutional Requirements	110
7.1	Introduction	110
7.2	Environmental Management Plan (EMP)	110
7.3	Objectives of EMP	111
7.4	Environmental Management Monitoring and Reporting	111
7.4.1	Inclusion of EMP in Contract documents	111
7.5	Institutional Arrangements	112
7.5.1	Role of PMU, KPCIP, LGE RDD	112
7.5.2	Role of the ADB	112
7.5.3	Role of Construction Supervision Consultant (CSC)	113
7.5.4	Role of KP EPA	113
7.5.5	Role of Project Contractor	113
7.5.6	Role of WSSCA	114
7.6	Monitoring Parameters	114
7.7	Environmental Training	115
7.7.1	Capacity Building and Training	115
7.8	Environmental Staffing and Reporting Requirements	115
7.9	Environmental Management Costs	159
8	Public Consultation and Information Disclosure	162
8.1	Identification of Stakeholders	162
8.1.1	Primary Stakeholders	162
8.1.2	Secondary Stakeholders	162
8.2	Consultation Process	163
8.3	Consultation with Project Affected Peoples	163
8.4	Consultation with Official Stakeholders:	166

8.5	Consultations with Scavengers and Scrap Dealers in Abbottabad	171
8.5.1	Introduction	171
8.5.2	Consultation Process and Findings	171
8.6	Consultation Plan for Construction and Operation Phase	173
9	Grievance Redressal Mechanism	174
9.1	General	174
10	Conclusion and Recommendations	177
RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST		1
(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.1		

ANNEXURES

Annexure A	Rapid Environmental Assessment (REA) Checklist
Annexure B	Questionnaires for Conducting FGDs & Surveys
Annexure C	Details of Public Consultations
Annexure D	Ambient Laboratory Monitoring
Annexure E	Occupational Health and Safety Plan
Annexure F	Emergency Response Plan
Annexure G	Archaeological 'Chance Find' procedure
Annexure H	Dust Management Plan
Annexure I	Site Specific EMP (SSEMP) Guide & Template for Guidance to Contractor
Annexure J	Traffic Management Plan
Annexure K	NEQS Guidelines
Annexure L	WHO advice on Use of Masks for the COVID-19 Virus
Annexure M	Solid Waste Management Framework
Annexure N	Species of Trees to be planted

LIST OF FIGURES

Figure 1-1: Location Map of Salhad Park - Abbottabad	7
Figure 1-2: Layout Map of Park.....	8
Figure 3-1: Accessibility Map to Project Site	32
Figure 3-2: Gas Ventilation System at Project Site	32
Figure 3-3: Leachate Control at Project Site.....	34
Figure 3-4: Admin Block Layout	35
Figure 3-5: Gazebo Plan	36
Figure 4-1: Geology of Project Area	42
Figure 4-2: Seismic Zoning Map of Pakistan	43
Figure 4-3: 3 Year Temperature Variation of District Abbottabad	47
Figure 4-4: 3 Year Precipitation Variation at District Abbottabad	47
Figure 4-5: a), annual maximum temperature during 1971-2015 (b), annual minimum temperature during 1971-2015.....	48
Figure 4-6: Wind rose for Abbottabad	49
Figure 4-7: Land use pattern of district Abbottabad during 1998-2009	50
Figure 4-8: Land use map of project area in 2km radius.....	52
Figure 4-9: Surface Water Body Map	53
Figure 4-10: Hydrological Map of Pakistan.....	54
Figure 4-11: Sampling Locations for Environmental Monitoring.....	57
Figure 7-1: Proposed Organogram of PMU KPCIP	116
Figure 7-2: Proposed Organogram of CIU WSSC Abbottabad	116
Figure 8-1: Photographs of Focus Group Discussions	165
Figure 9-1: Grievance Redressal Mechanism	176

LIST OF TABLES

Table 1.1: Executing Agency Contact Details.....	5
Table 2.1: Environmental Guidelines and Regulations	10
Table 2.2: ADB Policy Principles	15
Table 2.3: IFC Work Environment Noise limits	17
Table 2.4: Comparison of International and local Air Quality Standards*.....	18
Table 2.5: Comparison of International and Local Noise Standards	19
Table 2.6: Comparison of International and Local Water Quality Standards	19
Table 3.1: Project Scope and Objectives.....	21
Table 3.2: Estimated Contractor's Equipment and Machinery	31

Table 3.3: Source of Raw Material	37
Table 3.4: Climate events in Abbottabad and their impacts on the city	38
Table 3.5: Summary of the main Climate Change Trends and Projections observed in Abbottabad	38
Table 4.1: Climatic Data of Abbottabad Year 2019.....	46
Table 4.2: Climatic Data of Abbottabad Year 2018.....	46
Table 4.3: Historic Average Relative Humidity Levels for Abbottabad	48
Table 4.4: Ambient Noise Monitoring Results (Day and Night) in Project Area	58
Table 4.5: Comparison of ambient air quality results versus applicable Air Quality standards	58
Table 4.6: List of Flora observed in Project Area.....	59
Table 4.7: List of Mammals observed in Project Area.....	60
Table 4.8: List of Reptiles observed in Project Area	61
Table 4.9: List of Amphibians observed in Project Area	61
Table 4.10: List of Birds observed in Project Area.....	61
Table 6.1: 'Activity Wise' screening of possible Impacts during Design/Pre-Construction phase	71
Table 6.2: Screening of Possible Impacts during Construction Phase	76
Table 6.3: Control measures for Fugitive Dust emissions.....	79
Table 6.4: Construction Equipment Noise Ranges, dB (A)	82
Table 6.5: Screening of Possible Impacts during Operation Phase	105
Table 7.1: Environmental Management Plan.....	117
Table 7.2: 'Pre-Construction' Environmental Monitoring Plan for Baseline Development ..	154
Table 7.3: Construction Phase Monitoring Requirements.....	155
Table 7.4: Operation Phase Environmental Monitoring Plan	157
Table 7.5: Capacity Development and Training Programme	158
Table 7.6: Annual Cost Estimates for 'Pre-Construction Phase' Environmental Monitoring	159
Table 7.7: Annual Cost Estimates for 'Construction Phase' Environmental Monitoring.....	160
Table 7.8: Annual Cost Estimates for 'Operation Phase' Environmental Monitoring	160
Table 7.9: Estimated Costs for EMP Implementation	160
Table 7.10: Cost of Capacity Development and Training Programme for Project Contractor(s)	161
Table 8.1: Consultation with Project Affected Peoples	163
Table 8.2: Findings of Consultation with Government Stakeholders.....	168
Table 8.3: Table of Exclusive Consultation with Scavengers and Scrap Dealers.....	171

EXECUTIVE SUMMARY

Project Overview

1. The Khyber Pakhtunkhwa Cities Improvement Projects (KPCIP) will improve the quality of life of the residents of five KP cities, including Abbottabad, Kohat, Mardan, Mingora, and Peshawar, directly benefitting about 6 million of urban population. KPCIP will help selected cities improve their access to quality urban services through three interlinked outputs: (i) Climate resilient and gender friendly urban infrastructure improve, (ii) Institutional capacities of urban service providers and governments strengthened, and (iii) Increased women's participation in urban governance and access to economic opportunities.
2. KPCIP will support the Government of Pakistan's development priorities, established in (i) the National Water Policy (2018), (ii) the Local Government Act (2019), and (iii) Pakistan Vision 2025 . The project is also aligned with ADB's operational priorities of (i) addressing remaining poverty and reducing inequalities; (ii) accelerating progress in gender equality; (iii) tracking climate change, building climate and disaster readiness; (iv) making cities more livable; and (v) strengthening governance and institutional capacity, outlined in ADB's Strategy 2030, and is included in ADB's country operations business plan for Pakistan, 2021–2023.
3. The project readiness financing (approved in March 2019) has financed the preparation and engineering design of the KPCIP. The Department of Local Government, Elections and Rural Development Department (LGE&RDD), the Government of Khyber Pakhtunkhwa, will be the executing agency for the project and the city governments of the five target cities, including the respective Water and Sanitation Services Companies, will be the implementing agencies.
4. This report has been prepared based on detailed engineering designs, due diligence assessments, and studies conducted by the government and project readiness financing consultants. The Government of Pakistan, Asian Development Bank (ADB), and Asia Infrastructure Investment Bank (AIIB) are expected to approve KPCIP in Q3 2021.
5. The Khyber Pakhtunkhwa Cities Improvement Project (KPCIP) is being processed through the Project Readiness Finance (PRF) modality by Asian Development Bank (ADB) under Loan 6016-PAK, being executed by KP LGERDD. The Project is focused on investments of subprojects related to water supply, sanitation and drainage, solid waste management, and urban/green spaces. The Project has the following four major components:
 - Improvement of water supply systems in five (5) cities.
 - Improvement of sewerage and drainage systems in five (5) cities, including provision of sewage treatment plants (STPs)
 - Provision of Integrated Solid Waste management (ISWM) system in five (5) cities
 - Development of Urban/Green Spaces in five cities.
6. The proposed park site is an open solid waste dumping site situated in Lower Salhad in the south of Abbottabad City along the Karakoram Highway (N-35) at the entry point of

the Abbottabad city. The site consists of 21.25 acres of land and presently it is used as informal dumping of solid waste both by municipality and cantonment.

7. The proposed design will convert the site into a park after the closure of the dumping site in near future. The proposed design includes Land remediation, tree plantation of pine trees and flowering trees, Food service (Salhad Café), sitting spaces, children play areas, outdoor family area, public washroom, prayer area and parking space, Leachate collection and management system and methane gas collection and ventilation system. The Pine and Black Poplar are native species while the Bottle Brush and Pink Magnolia are exotic species but are now widely grown in many urban areas of Pakistan and it suits the local climate of the Abbottabad.
8. A map showing the location of the proposed park site is provided as **Figure ES-1** below. Summary of project components are provided in Tables **ES-1**, **ES-2** and **ES-3**.

Project Need

9. The development of Salhad Park on the existing dumpsite will turn a pollution source into an orchard and scenic stopping point for travellers. Its dense plantation, sitting spaces, café and parking space for over 70 vehicles will attract both tourists and locals to the site. The direct beneficiaries of this project will be the 1,684,233 residents of Abbottabad and Havelian and travelers of the KKH. The 36,018 residents of peri-urban Union Council Salhad will also witness positive impacts from reduction in the contamination of underlying aquifers and production of noxious fumes from open air garbage incineration. Fruit from the park's orchards will be available to the public free-of-cost. Tree plantation will also help reduce the urban heat island effect, purify the air and absorb greenhouse gases.

Environment Category of the Project

10. According to ADB's Safeguard Policy Statement (SPS) 2009, a Rapid Environmental Assessment (REA) Checklist was prepared for the proposed park development. Based on the initial findings, it was ascertained that certain adverse environmental impacts are not expected of significance that detailed assessment is required therefore IEE has been conducted for the proposed park development, and thus the subject project is considered environmentally "B" category as per ADB SPS, 2009.
11. Further regulatory requirements of Khyber Pakhtunkhwa Environment Protection Agency (KPEPA) shall be complied by KP LGERDD as per IEE/EIA Regulation 2000 as notified by the Pakistan Environment Protection Agency vide S.R.O. 339 (1)/2001 during the project approval and execution stage.

Scope and Objectives of the IEE

12. The scope of IEE will include environmental impact assessment of project activities for site remediation following by conversion of the existing dumping site into a park. Following are the objectives of the IEE:
 - Assess the existing environmental conditions of project area, including the identification of environmental sensitive receptors and develop a baseline of its prevalent environmental and socioeconomic conditions;

- Identify and investigate all impacts of the proposed park pre-construction/design, construction, operation phases, on the physical, biological and socioeconomic environment of the project area;
- To propose mitigation measures that would help KP LGERDD and WSSCA in conducting the proposed project activities in an environmentally sustainable manner;
- To uncover the planning and operational phase impacts up to micro-environment levels in which project is proposed to be sited; and
- To develop an Environmental Management Plan (EMP) that would assist KP LGERDD and WSSCA in the effective implementation of the recommendations of the IEE

Study Methodology

13. This involves collecting information from the ADB, PMU KPCIP and Engineering Design and Construction Management (EDCM) technical team on the proposed project activities and understanding the activities to identify potential impacts of implementing these.
14. Both secondary and primary data on ambient noise levels and air quality, water resources, flora, fauna and information from the detailed design conducted for this and other projects of similar nature was collected, reviewed, and analyzed. Field visits to the project area were undertaken and key receptors and stakeholders within the project area has been identified and consulted.
15. Detailed ambient air quality and noise monitoring was conducted around the proposed project area. In general, the air shed seems to be of reasonable quality with the ambient air quality mostly within the acceptable NEQS standards apart from SO₂, which is exceeding the guidelines at three of the four monitored locations and PM₁₀ exceeding the guidelines at all monitored locations. The increased SO₂ and PM₁₀ emissions are due to the high volume of traffic on the motorway coupled with the burning of waste at the site.
16. While the results indicate the ambient noise levels being within the most stringent guidelines during the daytime, however, exceedances were observed at the night time at all locations in the project area. This could possibly be due to the high volume of traffic on the Hazara motorway, resulting in high noise levels, particularly during the night time hours with traffic on this motorway running continuously.
17. The significance of impacts from the proposed project were then assessed and for those impacts requiring mitigation, suitable measures in project design, construction and operation phase were proposed to avoid/reduce impacts to within acceptable limits as per local and international applicable regulations. A detailed environmental management and monitoring plan has been developed to ensure compliance to the proposed measures during the project development.

Baseline Condition of Project location

Physical Environment

18. The topography of the project area (Abbottabad is predominately sub mountainous, eroded by intervening flat valleys, which are fertile and partially irrigated by canals or by lifting groundwater through tube wells. Along the northern boundary of the district, a series of low lying hills form barrier to the Mangal tract in district Mansehra. To the south of these

hills, Orash or Resh plains lie with an area of about six square kilometers. Another such tract is Dhan which is an elevated basin enclosed by Nara hills.

19. The proposed project site consists of a mix of even and uneven sloping terrain, made more uneven due to the waste dumping at this site.

Ecological Environment

20. Site is falling outside of restricted zone/wildlife/forest protected areas. However, there are two nearest protected areas which are the Ayubia National Park and the Qalandarabad game reserve. However, both of these protected areas are located over 50 km away from the proposed park site.

Public Consultation Process

21. As part of environmental and social assessment, detailed consultations were carried with primary and secondary stakeholders and also with institutional stakeholders. Meetings with village notables and focus group discussions (FGDs) with the communities, including women in the project area were carried out. The public consultation process was carried out by the KPCIP-EDCM team in May, 2020. Mainly key informants were consulted for these meetings which were carried out in an open and frank atmosphere conducive to appreciation of the basic elements of the project and dissemination of information on beneficial and adverse impacts and mitigation for adverse impacts.
22. A total 10 FGDs were conducted with a total 50 men and women participating in these 8 FGDs with seventeen women (34 percent) taking part in the consultative process. Information on positive and negative impacts associated with constructional and operational stage and proper mitigation of adverse impacts were shared at these consultations.
23. Findings of consultation shows that the local community is greatly looking forward to the project resulting in beautification of the area, generation of employment opportunities and economic uplift of the area and will result in reduction in disease vectors as well as odor and smoke emanating from the waste dump.
24. Consultation plan for construction and operation phase of the park development will be prepared in order to take response of project stakeholders and general public about the project. Periodic consultations and community feedback surveys will be carried out to develop positive perception about the project. Intended stakeholders for such consultations will be all stakeholders that are consulted at the time of IEE preparation and KPCIP PRF processing. Record of such consultations will be maintained at PMU/WSSCA offices and necessary changes in operational modalities will be introduced in the system in light of the response provided by the consultants

Analysis of Alternatives

25. The development of this park on the existing dumpsite will turn a pollution source into a orchard and scenic stopping point for travellers. Its dense plantation, sitting spaces, café and parking space for over 70 vehicles will attract both tourists and locals to the site. The direct beneficiaries of this project will be the 1,684,233 residents of Abbottabad and Havelian and travelers of the KKH. The 36,018 residents of peri-urban Union Council

Salad will also witness positive impacts from reduction in the contamination of underlying aquifers and production of noxious fumes from open air garbage incineration. Fruit from the park's orchards will be available to the public free-of-cost. Tree plantation will also help reduce the urban heat island effect, purify the air and absorb greenhouse gases.

26. If 'no project' option is triggered, it will result in loss of all the positive impacts mentioned above. The project will also greatly improve the aesthetics of the area while improving public health by removing disease vector generation and odor in the area. This park will also result in the economic uplift of the area with job opportunities being created and businesses being developed around the park activities. Thus, the 'no project' option is not a viable option.

Potential Major Impacts

27. The impact screening matrices for the pre-construction/design, construction and operation phases of the proposed park development are provided as **Tables ES.1, ES.2 and ES.3**.
28. **Pre-construction/design phase:** The key potential impacts that have been assessed and for which necessary mitigation measures have also been proposed, as required.
29. **Construction phase:** The key potential impacts that have been assessed and for which necessary mitigation measures have also been proposed, as required, are as follows:
- Impact on Surface water quality for Salhad Nullah
 - Degradation of air quality
 - High noise levels
 - Traffic congestion and community health and safety issues
 - Occupational health and safety issues
 - Communicable diseases including COVID-19
 - Improper handling and/or disposal of hazardous and non-hazardous waste
30. **Operation phase:** The key potential impacts that have been assessed and for which necessary mitigation measures have also been proposed, as required are as follows:
- Management of solid waste generated from park operation
 - Leachate collection and management system and methane gas collection and ventilation system

Key Mitigation Measures

31. Mitigation measures associated with design, construction and operation phases are detailed in the IEE report.

32. Mitigations associated with operations phase are handling of solid waste generated as well as leachate collection and management system and methane gas collection and ventilation system during operation phase. Solid waste management plan is developed to manage solid waste generated during park operation.

Environmental Management Plan

33. For the effective implementation and management of mitigation measures, an Environmental Management Plan (EMP) has been prepared and given in section 7 of the IEE report. The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities. The EMP has been prepared with the objective of:

- Defining legislative requirements, guidelines and best industry practices that apply to the project.
- Defining mitigation measures required for avoiding or minimizing potential impacts assessed by the IEE.
- Defining roles and responsibilities of the project proponent and the contractor/s; and
- Defining requirements for environmental monitoring and reporting.

34. The Environmental Management Plan (EMP) for the park development has been prepared keeping in view the anticipated environmental impacts during design, construction and operational stages of the project on the existing environmental conditions including air, soil, water, land, biodiversity and socio-economic condition of the project area, and suggests appropriate measures to mitigate the potential adverse impacts and enhance the positive impacts. The compliance monitoring of mitigation measure implementation would be ensured through the implementation of the Environmental Monitoring Plan included in the EMP. The EMP will be included in the contract under specific conditions making it obligatory for the construction contractor to carry out the works assigned in the EMP. During the operation phase, the CEO WSSCA will be responsible for ensuring implementation of the EMP.

EMP Cost, Monitoring and Reporting

35. Total estimated indicative cost for EMP implementation is about PKR 35.6 million which the main cost component being allocated for land remediation at 30 million. Environmental monitoring cost for pre-construction phase (once) will be PKR 378,000 while for the construction and operation phases (annually) will be about PKR 1,260,000 and PKR 126,000.
36. During the construction phase, the overall responsibility for the implementation and monitoring of the EMP rests with the Project Director (PD), Project Management Unit (PMU), KPCIP. The PD at the PMU, using the Construction Supervision Consultant (CSC), will supervise the implementation of the proposed mitigation measures and monitor the implementation progress in the field.
37. During the operation phase, the overall responsibility for the implementation and monitoring of the EMP rests with CEO WSSCA. Project will be administered and monitored through City Implementation Unit (CIU) that will be developed within WSSCA which will deliver services based on indicators sets out in Services and Assets Management Agreement (SAMA).

38. EMP implementation would be responsibility of all project stakeholders including PMU, WSSCA, Project Construction contractors, O&M contractor and other suppliers involved in the project. Requirement of environmental staffing will be part of bidding documents and necessary cost will be allocated as BOQ item by the bidder. PMU will maintain environmental safeguard staffing (Environmentalist/Environment Associate) for construction and operation phase of the project to monitor and supervise EMP implementation and performance.
39. Environment expert will also be part of CSC technical team and will produce bi-weekly and monthly environmental compliance reports during construction phase. Environment expert of CSC will be responsible to monitor the implementation of EMP during construction phase by project contractors. Project contractors will also hire sufficient environmental officers to implement the EMP requirements and prepare necessary EMP documentation. Project contractor EMP staff will prepare daily environmental reports and submit to CSC for approval and record. Within city implementation unit (CIU), WSSA will hire qualified environmental specialist during operation phase of the project who will be responsible for EMP implementation and reporting by WSSCA and its O&M contractors during operation. Monthly environmental compliance report will be prepared by WSSCA and circulated to concerned authorities.

Climate Risk and Vulnerability Assessment

40. Climate change can impact different aspects of the project activities due to projected increased temperatures and intense floods from heavy rainfalls which may cause landslides and affect the park infrastructure. In addition, high speed winds resulting from mini-cyclones type storm events are expected.

Cumulative Impacts

41. Based on the scoping exercise of the site and based on discussions with the public sector agencies responsible for development in the project area. No other infrastructure works are planned to be conducted in the project area while these project works shall be conducted. Thus, no cumulative impacts are expected.

Indirect and Induced Impacts

42. The potential impact of proposed park development in the project area has been examined, which indicated that the existing and planned infrastructure such as water supply, wastewater collection and treatment, municipal solid waste collection and disposal would be adequate to accommodate any potential population intake and associated demand. Impacts from the park development on the environment from air emissions, traffic and community noise have also been assessed and have found to be acceptable and within the carrying capacities of the environmental media.
43. Thus, negative indirect and induced impacts from the proposed park development are not expected during the operation phase. During construction phase, indirect impacts related to social nuisance are anticipated, resulting from the delayed or halted construction works. Such issues will be short term in nature and will be managed through effective coordination and GRM proposed for the project.

Institutional Arrangements

44. During the construction phase, the overall responsibility for the implementation and monitoring of the EMP rests with the Project Director (PD), Project Management Unit (PMU) KPCIP, KP Local Government Election and Rural Development Department (LGERDD). The PD through assistance from the Supervision Consultant's Environmental staff and the Environment team of PMU, will supervise the implementation of the proposed mitigation measures and monitor the implementation progress in the field. During operation phase, the responsibility of EMP implementation lies with WSSCA with limited support from PMU. Monthly environmental monitoring data/reports will be incorporated in the progress reports to be shared with ADB and such monthly reports will be consolidated into bi-annual monitoring reports and submitted to ADB for review and clearance. Upon clearance, all such reports will be uploaded on the PMU and ADB websites.

Conclusion & Recommendations

45. The proposed development of Salhad Park in Abbottabad is of high significance considering the urgent need for improving the aesthetics of this area by converting this existing site from a dumping ground to a recreational facility where the residents of the neighboring areas can visit and enjoy the facilities that will be developed. Furthermore, the aesthetics and public health aspects of this project area will greatly improve once the land has been rehabilitated and the park has been developed while a very positive impact on the Salhad Nullah is also expected in the long term as a result of the development of the park and remediation of this site.
46. An action plan with clear roles and responsibilities of stakeholders is provided in the IEE report. The PMU, Contractors, WSSCA and the CSC are the major stakeholders responsible for the action plan. The action plan must be implemented prior to commencement of construction work.
47. The majority of the environmental impacts are associated with the design and construction phase of the project since the operation phase will be largely environmentally benign considering the nature of the proposed sub-project.
48. Mitigation measures will be assured by a program of environmental monitoring conducted during construction to ensure that all measures in the EMP are implemented and to determine whether the environment is protected as intended. This will include observations on and off-site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported.
49. The implementation of mitigation measures during construction period will be the responsibility of the Contractor. Therefore, the required environmental mitigation measures will have to be clearly defined in the bidding and contract documents, and appropriately qualified environmental staff need to be retained by the Consultant to supervise the implementation process. The EMP includes measures to minimize project impacts due to traffic, noise, air pollution and waste generation etc.
50. The EMP contained within this IEE document is considered sufficient for issuance as part of the Contracts to the successful bidder(s) and for subsequent use during the project works. It should be mentioned that prior to the commencement of works, this EMP must be further updated by the Contractor into site specific EMPs (SSEMPs) for review and

approval of ADB. In these SSEMPs, aspects such as a detailed traffic management plan, identification of locations for disposal of debris and spoil and any other details which shall become available later must be included for efficient implementation of all proposed mitigation measures and the subsequent monitoring of these measures.

51. Based on the findings of the IEE, the subproject is unlikely to cause any significant, irreversible or unprecedented environmental impacts. The potential impacts are localized, temporary in nature and can be addressed through proven mitigation measures. Hence, the classification of the subproject as Category B per ADB SPS, 2009 is confirmed. No further study or assessment is required at this stage.
52. The IEE will be updated and the final IEE report will incorporate results of detailed engineering design and of any additional baseline monitoring as required (e.g., air, noise, surface water quality) and will be submitted to ADB for approval and disclosure at ADB website. The IEE study will also be disclosed locally at PMU KPCIP website at least two weeks prior to the next consultation to allow the public time to read, look for information or consult experts, and form opinions.

Information Disclosure

53. After completion/revision and approval from the ADB and the KP-EPA, the IEE will be disclosed to all the stakeholders as part of public consultation process. The summary of the IEE report will be made available to the stakeholders at ADB website and official website of PMU KPCIP LGERDD.

Table ES-1: Screening of possible Impacts during Design/Pre-Construction phase

S/No.	Potential Issue	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Unsuitable locations for disposal of solid waste dumped on site as part of site remediation	Likely	Moderate	Medium	Short Term
2	Insufficient site investigations leading to incomplete site remediation	Likely	Moderate	Medium	Short Term
3	Inadequate designing of leachate and landfill gas piping systems leading to risks to settlements in project area	Likely	Moderate	Medium	Short Term
4	Lack of integration of IEE/EMP requirements into Construction bid documents	Likely	Moderate	Medium	Short Term
5	Improper Material Haul Routes	Likely	Moderate	Medium	Short Term
6	Limited Contractor's Environmental Safeguards Capacity	Likely	Moderate	Medium	Short Term
7	Improper locations for Labor Camps and ancillary facilities	Likely	Moderate	Medium	Short Term
8	Cultural Heritage & Religious Sites, Social Infrastructure	Unlikely	Moderate	Low	No residual Impact
9	Land acquisition and resettlement impacts	Likely	Moderate	Medium	Long Term
10	Impacts due to natural hazards	Unlikely	Moderate	Low	No residual Impact
11	Impacts due to existing utilities	Likely	Moderate	Low	No residual Impact

■ Critical Risk Level■ Significant Risk Level■ Medium Risk Level■ Low Risk Level■ Positive Impacts

Table ES-2: Screening of Possible Impacts during Construction Phase

S/No.	Potential Issue	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Degradation of air quality due to construction works	Likely	Moderate	Medium	Short term
2	High noise levels from construction activities	Likely	Moderate	Medium	Short term
3	Impacts on surface water quality of Salhad Nullah	Likely	Moderate	Medium	Short term
4	Potential accidents and injuries to communities in project area	Likely	Moderate	Medium	Short term
5	Injuries to workers from lack of necessary training and/or not using PPEs etc.	Likely	Moderate	Medium	Short term
6	Improper handling and/or disposal of hazardous and non-hazardous waste	Likely	Moderate	Medium	Short term
7	Untreated disposal of effluent from worker camps and batching plant(s)	Likely	Moderate	Medium	Short term
8	Soil Contamination	Likely	Moderate	Medium	Short term
9	Employment Conflicts	Likely	Moderate	Medium	Short term
10	Communicable diseases incl. COVID-19	Likely	Moderate	Medium	Short term
11	Construction of Administration Building and Other Infrastructure	Likely	Moderate	Medium	Short term
12	Site Restoration	Likely	Moderate	Medium	Short term
13	Vegetation and Wildlife Loss	Unlikely	Moderate	Low	No residual Impact
14	Historical/Archaeological Sites	Unlikely	Moderate	Low	No residual Impact

 Critical Risk Level

 Significant Risk Level

 Medium Risk Level

 Low Risk Level

 Positive Impacts

Table ES-3: Screening of Possible Impacts during Operation Phase

S/No.	Potential Issues	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Generation of solid waste	Likely	Major	Medium	Long Term
2	Leachate collection and management system and methane gas collection and ventilation system	Likely	Major	Medium	Long Term
3	Septic tank effluent disposal from washroom toilets	Likely	Major	Medium	Long Term
4	Generation of job opportunities	Positive impacts expected			Long term positive residual impact
5	Improved aesthetics and public health in area due to site remediation and removal of odor and disease vectors	Positive impacts expected			Long term positive residual impact
6	Prevention of contamination of Salhad Nala from dumped waste	Positive impacts expected			Long term positive residual impact
7	Improvements in Public Health	Positive impacts expected			Long term positive residual impact

 Critical Risk Level
 Medium Risk Level
 Positive Impacts

 Significant Risk Level
 Low Risk Level

Figure ES-1: Location Map of Salhad Park – Abbottabad



1 Introduction

1.1 Overview

1. The Khyber Pakhtunkhwa Cities Improvement Projects (KPCIP) will improve the quality of life of the residents of five KP cities, including Abbottabad, Kohat, Mardan, Mingora, and Peshawar, directly benefitting about 6 million of urban population. KPCIP will help selected cities improve their access to quality urban services through three interlinked outputs: (i) Climate resilient and gender friendly urban infrastructure improve, (ii) Institutional capacities of urban service providers and governments strengthened, and (iii) Increased women's participation in urban governance and access to economic opportunities.
2. KPCIP will support the Government of Pakistan's development priorities, established in (i) the National Water Policy (2018), (ii) the Local Government Act (2019), and (iii) Pakistan Vision 2025 . The project is also aligned with ADB's operational priorities of (i) addressing remaining poverty and reducing inequalities; (ii) accelerating progress in gender equality; (iii) tracking climate change, building climate and disaster readiness; (iv) making cities more livable; and (v) strengthening governance and institutional capacity, outlined in ADB's Strategy 2030, and is included in ADB's country operations business plan for Pakistan, 2021–2023.
3. The project readiness financing (approved in March 2019) has financed the preparation and engineering design of the KPCIP. The Department of Local Government, Elections and Rural Development Department (LGE&RDD), the Government of Khyber Pakhtunkhwa, will be the executing agency for the project and the city governments of the five target cities, including the respective Water and Sanitation Services Companies, will be the implementing agencies.
4. This report has been prepared based on detailed engineering designs, due diligence assessments, and studies conducted by the government and project readiness financing consultants. The Government of Pakistan, Asian Development Bank (ADB), and Asia Infrastructure Investment Bank (AIIB) are expected to approve KPCIP in Q3 2021.
5. The Khyber Pakhtunkhwa Cities Improvement Project (KPCIP) is being processed through the Project Readiness Finance (PRF) modality by Asian Development Bank (ADB) under Grant 6016-PAK, being executed by KP LGERDD. The Project is focused on investments of subprojects related to water supply, sanitation and drainage, solid waste management, and urban/green spaces. The Project has the following four major components:
 - Improvement of water supply systems in five (5) cities.
 - Improvement of sewerage and drainage systems in five (5) cities, including provision of sewage treatment plants (STPs)
 - Provision of Integrated Solid Waste management (ISWM) system in five (5) cities
 - Development of Urban/Green Spaces in five cities.

6. The proposed park site is an open solid waste dumping site situated in Lower Salhad in the south of Abbottabad City along the Karakoram Highway (N-35) at the entry point of the Abbottabad city. The site consists of 21.25 acres of land and presently it is used as informal dumping of solid waste both by municipality and cantonment.
7. The proposed design will convert the site into a park after the closure of the dumping site in near future. The proposed design includes Land remediation, tree plantation of pine trees and flowering trees, Food service (Salhad Café), sitting spaces, children play areas, outdoor family area, public washroom, prayer area and parking space, Leachate collection and management system and methane gas collection and ventilation system.
8. This Initial Environmental Examination (IEE) document focuses solely on the scope of works of the park development and assesses any potentially significant impacts and proposes required mitigation measures, which shall be implemented by the Contractor and monitored by the Project Management Unit (PMU), KPCIP, KP Local Government, Elections and Rural Development Department (LGERDD) and ADB using the Environmental Management Plan (EMP).

1.2 Project Location

9. As mentioned above, the proposed park site is located in Lower Salhad in the south of Abbottabad city and the map showing the location of the proposed park site is shown in **Figure 1-1** and the project layout is provided as **Figure 1-2** below.

1.3 Objective of IEE

- Assess the existing environmental conditions of project area, including the identification of environmental sensitive receptors and develop a baseline of its prevalent environmental and socioeconomic conditions;
- Identify and investigate all impacts of the proposed project pre-construction/design, construction, operation, on the physical, biological and socioeconomic environment of the project area;
- To propose mitigation measures that would help KP LGERDD and WSSCA in conducting the proposed project activities in an environmentally sustainable manner;
- To uncover the planning and operational phase impacts up to microenvironment levels in which project is proposed to be sited; and
- To develop an Environmental Management Plan (EMP) that would assist KP LGERDD and WSSCA in the effective implementation of the recommendations of the IEE.

1.4 Environmental Category of Project

10. According to ADB's Safeguard Policy Statement (SPS) 2009, a Rapid Environmental Assessment (REA) Checklist was prepared for the proposed park development (**Annexure A**). Based on the initial findings, it was ascertained that certain adverse environmental impacts are not expected of significance that detailed assessment is required therefore IEE has been conducted for the proposed park development, and thus the subject project is considered environmentally "B" category as per ADB SPS, 2009.

11. Further regulatory requirements of Khyber Pakhtunkhwa Environment Protection Agency (KPEPA) shall be complied by KP LGERDD as per IEE/EIA Regulation 2000 as notified by the Pakistan Environment Protection Agency vide¹ S.R.O. 339 (1)/2001 during the project approval and execution stage.

1.5 Methodology of IEE Study

12. The various steps undertaken in the preparation of the IEE are summarized below:

1.5.1 Understanding of the Proposed Operation

13. This involves collecting information from the ADB, PMU KPCIP and Engineering Design and Construction Management (EDCM) technical team on the proposed project activities and understanding the activities to identify potential impacts of implementing them.

1.5.2 Review of Legislation and Guidelines

14. National legislation, international agreements, environmental guidelines both of KP Environment Protection Authority (KP-EPA), and ADB, and best industry practices has been reviewed to set environmental standards that KP LGREDD as the executing Agency will adhere during implementation of the project.

1.5.3 Secondary Data Collection

- Available published and unpublished information pertaining to the background environment has been obtained and reviewed. All data sources have been carefully reviewed to collect the following information.
- Physical environment – topography, geology, seismology, geomorphology, soils, surface and groundwater resources and climate;
- Biological environment – habitat types, flora and fauna (particularly rare or endangered species), critical habitats, vegetation and communities within the area;
- Physical cultural resources – sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance; and,
- Socio-economic environment – settlements, socio-economic conditions, infrastructure and land use.

1.5.4 Field Data Collection (Baseline Survey)

15. Field visits were undertaken consisting of preliminary scoping through survey and assessment activities to establish the potential impacts and categorization of activities and the Rapid Environmental Assessment (REA) was completed. The key receptors and stakeholders within the project area were identified.
16. Baseline surveys required to identify and establish physical and biological conditions and ecosystems in the project area has been carried out by IEE team and results has been incorporated in this report. The socio-economic environment in the project areas has been

¹ <https://www.informeia.org/en/legislation/pakistan-environmental-protection-agency-review-iee-and-eia-regulations-2000>

obtained through the socio-economic profiles and social impact assessment carried out by social safeguard team. Climate risk and vulnerability assessment findings are discussed.

17. Primary data collection in two kilometer area of influence such as ambient noise levels, ambient air quality and ground water quality at the key receptor locations in the project area and particularly in close proximity to the project site was conducted.
18. Review of secondary information on the physical, biological and ecological aspects, physical cultural resources and infrastructure utilities in the project area has been conducted.

1.5.5 Public Consultation

19. Public consultations (PC) were carried out with all key stakeholders, particularly local communities residing in the project area, local businesses and government and local government bodies in line with ADB's "Safeguard Policy Statement (SPS) – June 2009"/ Environmental Assessment Guidelines. Under ADB requirements, the environmental assessment process must also include meaningful public consultations during the completion of the study. In this IEE, the Public Consultation process was carried out including verbal disclosure regarding the project development with stakeholders to brief them about project and to seek their response/recommendation.

1.5.6 Impact Identification and Assessment

20. Potential impacts arising from each phase of the proposed project has been identified and assessed on the basis of field data, secondary data, expert opinion and examining previous similar projects in Pakistan. These include effects on physical, biological and socio-economic environment.

1.5.7 Recommendations for Mitigation Measures

21. Mitigation measures to minimize, eliminate or compensate the potential environmental impacts has been recommended. The mitigation measures have been recommended on the basis of past experiences, best industry practices, legislative requirements and professional judgment.

1.5.8 Development of Environmental Management Plan (EMP)

22. An Environmental Management Plan (EMP) has been developed for effective implementation of the recommended mitigation measures. The EMP has included controls to minimize the identified impacts and monitoring program to monitor effect of mitigation measures implemented and residual impacts, if any, during implementation. The EMP has identified roles and responsibilities of all concerned parties during the implementation of the project.

1.6 Proponent of Project

23. The LGERDD, GoKP is the Executing Agency (EA) for the proposed park development while the project will be implemented through Water and Sanitation Services Company (WSSC), Abbottabad with the support of Project Management Unit (PMU). Contact details of the EA are provided as **Table 1.1** below.

Table 1.1: Executing Agency Contact Details

Executing Agency Details	Information
Name of EA	Project Management Unit (PMU) KPCIP, Local Government, Elections and Rural Development Department (LGE&RDD), GoKP
Address	Ground Floor, Afzal Apartments, Jamrud Road, Phase-3 Chowk, Hyatabad Peshawar
Telephone	0092-91-5854555
E-mail	pdkpcip@gmail.com , info@kpcip.gov.pk
Web	Kpcip.gov.pk

1.7 Structure of the Report

24. The IEE report contains eleven chapters as follows:

- Introduction
- Policy and Legal Framework
- Description of the Project
- Description of Environment
- Analysis of Alternatives
- Assessment of Environmental Impacts and Mitigation Measures
- Institutional Requirements Environmental Management Plan
- Public Consultation
- Grievance Redressal Mechanism
- Findings, Recommendations and Conclusions
- References

1.8 IEE Team

25. IEE team comprising of following members

- Environment Specialists by ADB, PMU KP LGREDD and Engineering Design Construction Management (EDCM)
- Environmental associate
- Park design experts
- Integrated Environmental Laboratory
- Climate change expert
- Social Safeguard Expert

- Social safeguard team of EDCM
- Gender Expert
- ADB and PMU technical team

1.9 Further Additions & Updating of IEE Study

54. This version of the report will be further updated once any other details of the proposed park development project become available over the coming weeks and months. These revisions shall be incorporated into any subsequent updated versions of this IEE report. Furthermore, the draft IEE/EMP will be disclosed locally at least two weeks prior to the next consultation to allow the public time to read, look for information or consult experts and form opinions. This will help ensure a meaningful process. (per SPS's environmental principle 6).

Figure 1-1: Location Map of Salhad Park – Abbottabad

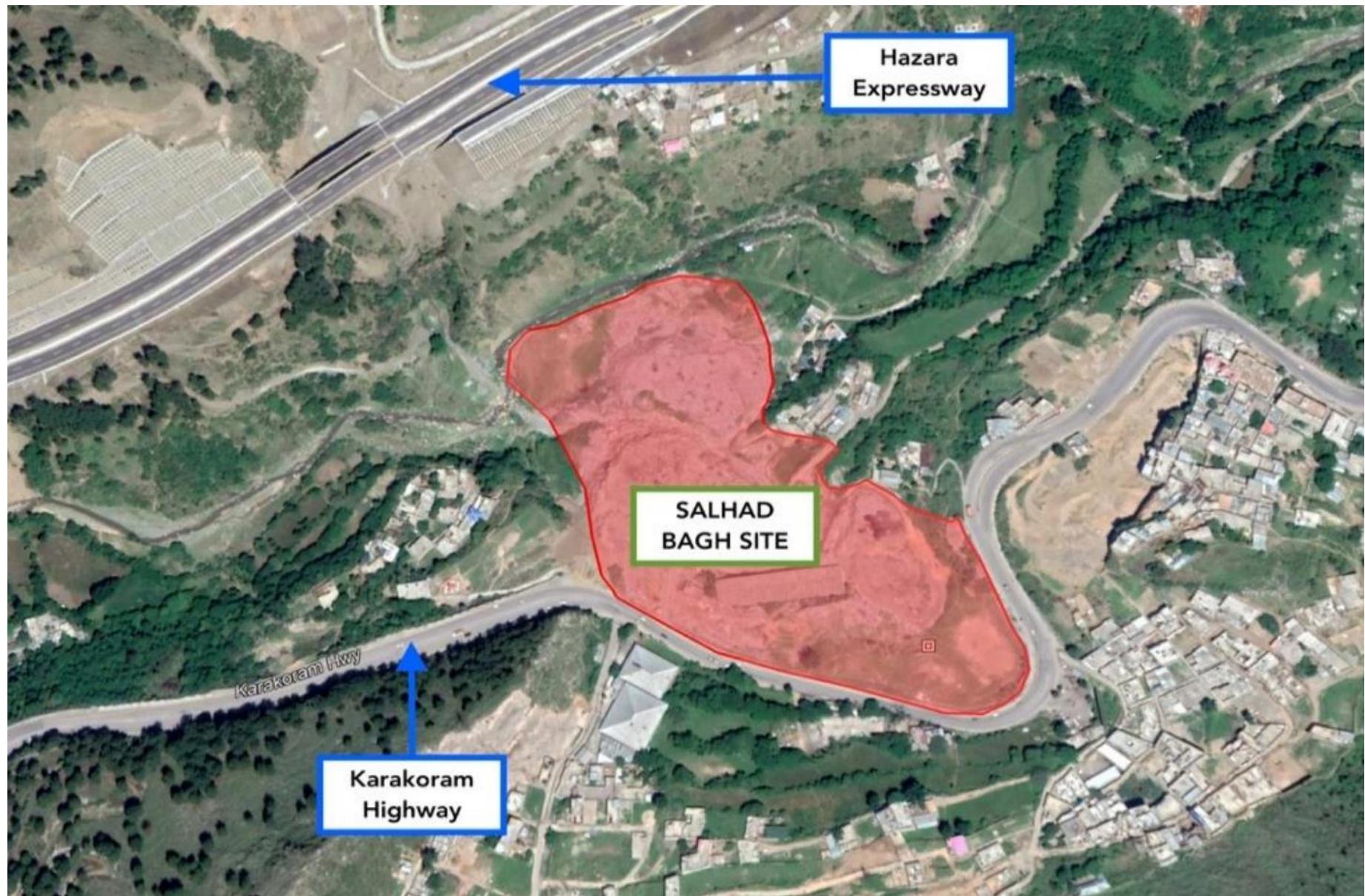
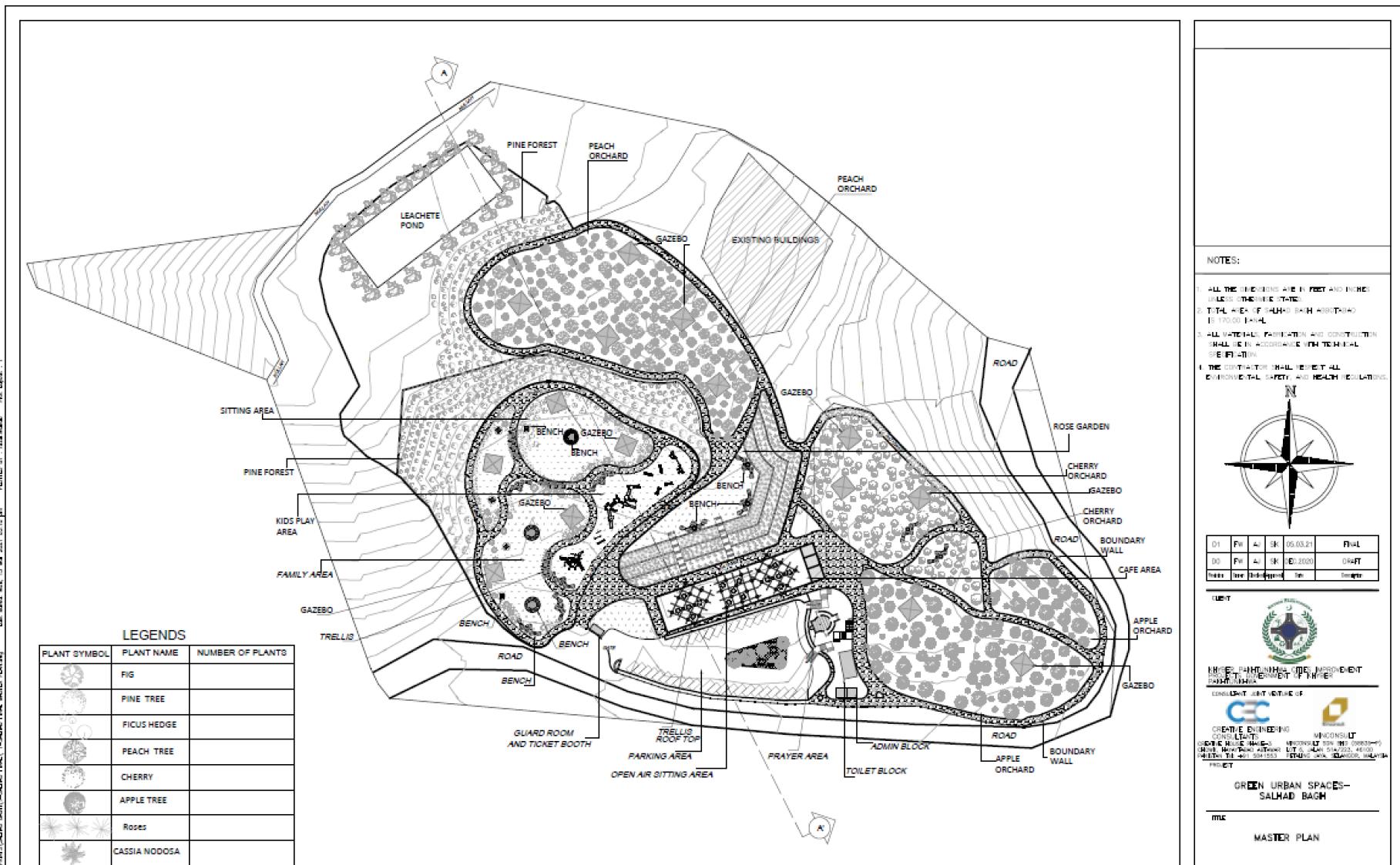


Figure 1-2: Layout Map of Park



2 Policy and Legal Framework

2.1 General

26. This section provides an overview of the policy framework and national legislation that applies to the proposed Salhad Park development in Abbottabad city, Pakistan. The project will comply with all national legislation relating to the environment in Pakistan and will obtain all the regulatory clearances required from the financing agency, ADB. Project will be consistent with the environmental safeguards requirements as specified in the ADB SPS 2009.

2.2 National Policy and Legal Framework

27. The Pakistan National Conservation Strategy (NCS) that was approved by the federal cabinet in March 1992 is the principal policy document on environmental issues in the country (EUAD/IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment.
28. Prior to the adoption of the 18th Constitutional Amendment, the Pakistan Environmental Protection Act (PEPA) 1997 was the governing law for environmental conservation in the country. Under PEPA 1997, the Pakistan Environmental Protection Council (PEPC) and Pak EPA were primarily responsible for administering PEPA 1997. Post the adoption of the 18th Constitutional Amendment in 2011, the subject of environment was devolved, and the provinces have been empowered for environmental protection and conservation.

2.3 Regulations for Environmental Assessment, Pakistan EPA

29. Under Section 12 (and subsequent amendment) of the PEPA (1997), a project falling under any category specified in Schedule I of the IEE/EIA Regulations (SRO 339 (I)/2000), requires the proponent of the project to file an IEE with the concerned provincial EPA. Projects falling under any category specified in Schedule II require the proponent to file an EIA with the provincial agency, which is responsible for its review and accordance of approval or request any additional information deemed necessary.

2.4 Regulatory Clearances, KP EPA

30. In accordance with provincial regulatory requirements, an IEE/EIA satisfying the requirements of the KP Environmental Protection Act (2014) is to be submitted to KP environmental protection agency (KP-EPA) for review and approval, and subsequent issuance of NOC before the commencement of construction.

2.5 Guidelines for Environmental Assessment, Pakistan EPA

31. The Pak-EPA has published a set of environmental guidelines for conducting environmental assessments and the environmental management of different types of development projects. The guidelines that are relevant to the proposed sub-project are listed below:

- Guidelines for the Preparation and Review of Environmental Reports, Pakistan, EPA1997;
- Guidelines for Public Consultations; Pakistan EPA May 1997;

2.6 National Environmental Quality Standards (NEQS) 2000 & 2010

32. The National Environmental Quality Standards (NEQS), 2000 & 2010, specify the following standards:
- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers);
 - Maximum allowable concentration of pollutants (16 parameters) in gaseous emissions from industrial sources;
 - Maximum allowable concentration of pollutants (two parameters) in gaseous emissions from vehicle exhaust and noise emission from vehicles;
 - Maximum allowable noise levels from vehicles;
 - Maximum allowable concentration of parameters in drinking water.

33. The NEQS are attached as **Annexure K**.

2.7 Other Environment Related Legislations

34. The national laws and regulations are provided in **Table 2.1** below.

Table 2.1: Environmental Guidelines and Regulations

Legislation/Guideline	Description
National Environmental Policy (2005) (NEP)	NEP is the primary policy of Government of Pakistan addressing environmental issues. The broad Goal of NEP is, "to protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development". The NEP identifies a set of sectoral and cross-sectoral guidelines to achieve its goal of sustainable development. It also suggests various policy instruments to overcome the environmental problems throughout the country.
The Forest Act (1927)	The Act empowers the provincial forest departments to declare any forest area as reserved or protected. It empowers the provincial forest departments to prohibit the clearing of forest for cultivation, grazing, hunting, removing forest produce, quarrying and felling, lopping and topping of trees, branches in reserved and protected forests. No protected forest is situated with in the area of influence of project activities i.e.Salhad Park development.

Legislation/Guideline	Description
Khyber Pakhtunkhwa Wildlife and Biodiversity Act, 2015	It empowers the government to declare certain areas reserved for the protection of wildlife and control activities within these areas. It also provides protection to endangered species of wildlife. As no activities are planned in these areas, no provision of this law is applicable to the proposed project.
The KP Antiquities Act (2016)	It ensures the protection, preservation, development and maintenance of antiquities in the province of KP. The Act defines "antiquities" as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The Act is designed to protect these 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 GoKP to prohibit excavation in any area that may contain articles of archaeological significance. Under the Act, the subproject proponents are obligated to ensure that no activity is undertaken in the proximity of a protected antiquity, report to the Department of Archaeology, GoKP, any archaeological discovery made during the course of the project. However, if any archaeological antiquity discovered Archeological Chance Find procedure shall be adopted, attached as Annexure G .
Pakistan Penal Code (1860)	It authorizes fines, imprisonment or both for voluntary corruption or fouling of public springs or reservoirs so as to make them less fit for ordinary use.
NATIONAL ENVIRONMENTAL AND CONSERVATION STRATEGIES	
National Conservation Strategy	Before the approval of NEP, the National Conservation Strategy (NCS) was considered as the Government's primary policy document on national environmental issues. At the moment, this strategy just exists as a national conservation program. The NCS identifies 14 core areas including conservation of biodiversity, pollution prevention and abatement, soil and water conservation and preservation of cultural heritage and recommends immediate attention to these core areas.
Biodiversity Action Plan	The plan recognizes IEE/EIA as an effective tool for identifying and assessing the effects of a proposed operation on biodiversity.
INTERNATIONAL CONVENTIONS	
The Convention on Conservation of Migratory Species of Wild Animals (1981.21)	The Convention requires countries to take action to avoid endangering migratory species. The term "migratory species" refers to the species of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries. The parties are also required to promote or cooperate with other countries in matters of research on migratory species. There are no critical habitat of endangered species of plant life or animal life in the vicinity of the proposed park.

Legislation/Guideline	Description
Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973)	The convention requires Pakistan to impose strict regulation (including penalization, confiscation of the specimen) regarding trade of all species threatened with extinction or that may become so, in order not to endanger their survival further.
International Union for Conservation of Nature and Natural Resources Red List (2000)	Lists wildlife species experiencing various levels of threats internationally. Some of the species indicated in the IUCN red list are also present in the wetlands of Pakistan.
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) (1971)	The Ramsar Convention deals with the protection of water bodies of international importance and their associated biodiversity, as well as promoting wise use of allied resources. The Convention was adopted in 1971 at Ramsar, Iran and entered into force in 1975. Pakistan signed the Ramsar Convention in 1971, and ratified it in July 1976. There are 19 Ramsar sites in Pakistan.
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (1992)	The Basel Convention deals with the controlled trans-boundary movement of hazardous wastes and their disposal. The Convention was adopted on March 22, 1989, and entered into force on May 5, 1992; Pakistan signed the Convention in May 1992 and ratified it in October 1994.
United Nations Framework Convention on Climate Change (UNFCCC) (1994)	This convention highlights broad guidelines for protecting the climate of the planet. It was adopted in 1992 and came into force in 1994. Pakistan signed the UNFCCC in 1992 and ratified it in June 1994.
Kyoto Protocol to UNFCCC (2005)	The Kyoto Protocol seeks to mitigate climate change and to reverse the pace of climate change through the use of carbon sequestration and carbon credits known as Certified Emission Reduction trading. The Protocol was adopted in 1997 and came into force in 2005; Pakistan signed the Protocol in December 1997 and ratified it in January 2005.

2.8 Implications of national policies and regulations on proposed project

35. The Pak-EPA formulated regulations in 2000 for 'Review of IEE and EIA' which categories development projects under three Schedules-Schedules I, II and III. Projects are classified on the basis of expected degree and magnitude of environmental impacts and the level of environmental assessment required is determined from the schedule under which the project is categorized.

36. The projects listed in Schedule-I include those where the range of environmental issues is comparatively narrow and the issues can be understood and managed through less extensive analysis. Schedule-I projects require an IEE to be conducted, rather than a full-fledged EIA, provided that the project is not located in an environmentally sensitive area.
37. The projects listed in Schedule-II are generally major projects and have the potential to affect a large number of people in addition to significant adverse environmental impacts. The impacts of projects included in Schedule-II may be irreversible and could lead to significant changes in land use and the social, physical and biological environments.
38. The proposed project has been categorized as Schedule I (G) and requires an IEE.
39. The LGERDD, GoKP, being the Executing Agency for the Project is responsible for management of project impacts, and have to undertake the commitments and mitigation measures proposed in this environmental report and in the subsequent review and approval conditions.
40. According to the regulations, no construction, preliminary or otherwise, relating to the project shall be undertaken until and unless approval of the IEE/EIA report has been issued by the KP-EPA.
41. The LGERDD will submit the IEE/EIA Report on a prescribed application along with the processing fee to KP EPA. After submission of the environmental assessment report, a forty-five (45) day period for review will be provided. The assessment will be completed within a period of one hundred and twenty (120) days from receipt of the complete documents, and earlier than this wherever practicable.

2.9 ADB's Safeguard Policy Statement (SPS), 2009

42. The ADB's SPS 2009 requires that environmental considerations be incorporated into ADB funded projects to ensure that the project will have minimal environmental impacts and be environmentally sound. Occupational health & safety of the local population should also be addressed as well as the project workers as stated in SPS. A Grievance Redress Mechanism (GRM) to receive application and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance is also established.
43. All loans and investments are subject to categorization to determine environmental assessment requirements. Categorization is to be undertaken using Rapid Environmental Assessment (REA) checklists, consisting of questions relating to (i) the sensitivity and vulnerability of environmental resources in project area, and (ii) the potential for the project to cause significant adverse environmental impacts. Projects are classified into one of the following environmental categories:
 44. **Category A:** A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment (EIA) is required.
 45. **Category B:** A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts

are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination (IEE) is required. The project falls in **Category 'B'**. ADB requirements as stated in ADB SPS (2009) are that the IEE should at least include:

- A screening process for project should be conducted as early as possible, to determine the appropriate extent and type of environmental assessment and/or audit required so that appropriate studies are undertaken commensurate with the significance of the Projects' potential environmental and social impacts and risks;
 - Studying baseline information, which includes biodiversity, air quality, and noise and water quality. Required baseline surveys for each parameter that is present in the environmental conditions;
 - An assessment of all the environment impacts in the project area;
 - Mitigation measures, an environmental management plan including the use of appropriate mitigation technologies, an environmental monitoring plan with monitoring indicators, and institutional arrangements and responsibilities (including cost estimates and training);
 - Examination of EA's implementation capacity in relation to Environmental safeguards needs and an institution review. A capacity development program to cover all of the marked capacity gaps.
46. ADB SPS 2009 also guide that the borrower/client will assess the significance of project impacts and risks on biodiversity and natural resources as an integral part of the environmental assessment process
47. **Category C:** A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
48. **Category FI:** A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary (FI).

2.10 ADB's Access to Information Policy (AIP) 2018

49. ADB's new Access to Information Policy (AIP), reflects the ADB's ongoing commitment to transparency, accountability, and participation by stakeholders. The policy contains principles and exceptions to information sharing with external stakeholders, led by a new overarching principle of "clear, timely, and appropriate disclosure."

2.11 ADB's Accountability Mechanism Policy 2012

50. The objectives of the Accountability Mechanism are providing an independent and effective forum for people adversely affected by ADB-assisted projects to voice their concerns and seek solutions to their problems, and to request compliance review of the alleged noncompliance by ADB with its operational policies and procedures that may have caused, or is likely to cause, them direct and material harm. The Accountability Mechanism is a "last resort" mechanism.

2.12 Implications of ADB's safeguard policies on proposed project

51. The objectives of ADB's safeguards are to:

- avoid adverse impacts of projects on the environment and affected people, where possible;
 - minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; and
 - Help borrowers/clients to strengthen their safeguard systems.
52. ADB's SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:
- environmental safeguards,
 - involuntary resettlement safeguards, and
 - Indigenous Peoples safeguards.
53. The objective of the environmental safeguards is to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. ADB's policy principles are summarized in **Table 2.2** below.

Table 2.2: ADB Policy Principles

No.	Policy principle	Summary
1	Screening and categorization	Screening process initiated early to determine the appropriate extent and type of environmental assessment.
2	Environmental assessment	Conduct an environmental assessment to identify potential impacts and risks in the context of the project's area of influence.
3	Alternatives	Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts, including no project alternative.
4	Impact mitigation	Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts. Prepare an environmental management plan (EMP).
5	Public consultations	Carry out meaningful consultation with affected people and facilitate their informed participation. Involve stakeholders early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation. Establish a grievance redress mechanism.

No.	Policy principle	Summary
6	Disclosure of environmental assessment	Disclose a draft environmental assessment in a timely manner, in an accessible place and in a form and language(s) understandable to stakeholders. Disclose the final environmental assessment to stakeholders.
7	Environmental management plan	Implement the EMP and monitor its effectiveness. Document monitoring results and disclose monitoring reports.
8	Biodiversity	Do not implement project activities in areas of critical habitats.
9	Pollution prevention	Apply pollution prevention and control technologies and practices consistent with international good practices. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges. Avoid the use of hazardous materials subject to international bans or phase outs.
10	Occupational health and safety/Community safety.	Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.
11	Physical cultural resources	Conserve physical cultural resources and avoid destroying or damaging them. Provide for the use of "chance find" procedures.

2.13 Comparison of International and Local Environmental Legislations

- 54. The ADB SPS, 2009 requires application of pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards. The SPS states that when host country regulations differ from these standards, the EA will achieve whichever is more stringent.
- 55. In order to select the most stringent standards applicable, a mix of local (NEQS) and international (IFC) regulations have been selected. The IFC Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines and Environmental standards are also applicable. It shall be ensured that all necessary noise mitigation measures are implemented to minimize the noise levels in the project area.
- 56. The **Table 2.3** presents IFC workplace noise standards that are applicable to the construction workers. It should also be noted that IFC EHS guidelines advise that where existing ambient noise levels already exceed thresholds, the project should not result in an increase of more than 3 dB over existing ambient noise levels at the nearest receptor location off-site.

57. A comparison of applicable local and international guidelines for ambient air quality has been provided in **Table 2.4** below. In the case of most pollutants, the Pak NEQS standards for ambient air quality are more stringent in comparison to USEPA and WHO/IFC standards. The applicable and most stringent parameters for each respective pollutant are highlighted in green.
58. Similar to the standards for air quality, the comparison of noise standards provided in **Table 2.5** clearly shows that the Pakistan NEQS standards for noise are more stringent in comparison to the IFC standards. The only exception is the daytime noise level standard for Industrial areas where the IFC standard is more stringent (70 dB (A)) in comparison to NEQS (75 dB (A)) and so for this particular parameter, the IFC standard will be used. Apart from this one exception, the NEQS standards have been used for water quality assessment of the proposed park development.
59. Comparison of International and Local Water Quality Standards has been provided in **Table 2.6**. Standard for Bacterial contamination are same for both NEQS and IFC/WHO standard while physical parameters are different. NEQS for odor, turbidity, hardness and pH are more stringent while IFC/WHO standards are stringent in metallic contaminations i.e. Arsenic, Barium, Boron, Cadmium and Zinc.
60. As far as regulations regarding other environmental parameters are concerned such as acceptable effluent disposal parameters, the local regulations i.e. NEQS take precedence over any other international regulations such as IFC.

Table 2.3: IFC Work Environment Noise limits

Type of Work, workplace	IFC General EHS Guidelines
Heavy Industry (no demand for oral communication)	85 Equivalent level L _{eq,8h}
Light industry (decreasing demand for oral communication)	50-65 Equivalent level L _{eq,8h}

Table 2.4: Comparison of International and local Air Quality Standards*

Pollutants	USEPA		WHO/IFC		Pak. NEQS	
	Avg. Time	Standard	Avg. Time	Standard	Avg. Time	Standard
SO ₂	6 hrs. 1 hr.	0.5 ppm 75 ppb	24 hr. 10 min	20 up/m ³ 500 up/m ³	Annual Mean 24 hrs.	80 up/m ³ 120 up/m ³
CO	8 hrs. 1 hr.	9 ppm (11 mg/m ³) 35 ppm (43 mg/m ³)	-	-	8 hrs. 1 hr.	5 mg/m ³ 10 mg/m ³
NO ₂	Annual Mean 1 hr.	100 up/m ³ (53 ppb) 100 ppb	1 yr. 1 hr.	40 up/m ³ 200 up/m ³	Annual Mean 24 hrs.	40 up/m ³ 80 up/m ³
O ₃	8 hrs.	0.07ppm (148 up/m ³)	8 hrs.	100 up/m ³	1 hr.	130 up/m ³
TSP	-	-	-	-	Annual Mean 24 hrs.	360 up/m ³ 500 up/m ³
PM ₁₀	24 hrs.	150 up/m ³	1 yr. 24 hr.	20 up/m ³ 50 up/m ³	Annual Mean 24 hrs.	120 up/m ³ 150 up/m ³
PM _{2.5}	Annual Mean 24 hrs.	15 up/m ³ 35 up/m ³	1 yr. 24 hr.	10 up/m ³ 25 up/m ³	Annual Average 24 hrs. 1 hr.	15 up/m ³ 35 up/m ³ 15 up/m ³

*: The standards highlighted in green for each respective pollutant are the most stringent based on a comparison between local and international regulations and thus shall be applicable for the proposed project.

* In instances where the air shed is significantly degraded and the pollutant levels are already exceeding the ambient pollutant concentrations provided in the table above, it shall be ensured that the project activities cause as small an increase in pollution levels as feasible, and amounts to a fraction of the applicable short term and annual average air quality guidelines or standards as established in the project specific environmental assessment.

Table 2.5: Comparison of International and Local Noise Standards

Category of Area/Zone	Limit in dB(A) Lea			
	NEQS		WHO/IFC	
	Day Time 06:00 – 22:00	Night Time 22:00-06:00	Day Time 07:00 – 22:00	Night Time 22:00-07:00
Residential area (A)	55	45	55	45
Commercial area (B)	65	55	70	70
Industrial area I	75	65	70	70
Silence zone (D)	50	45	55	45

*: The standards highlighted in green for each respective Area/Zone are the most stringent based on a comparison between local and international regulations and thus shall be applicable for the proposed project.

* In instances where baseline noise levels are already exceeding the standards above, it will need to be ensured that the project activities do not cause an increment of more than 3 dB (A) from the baseline noise levels.

Table 2.6: Comparison of International and Local Water Quality Standards

Parameter	Unit	NEQS	WHO/IFC
Bacterial			
E-Coli	numbers/ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
Total Coliform	numbers/ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample
Physical			
Color	TCU	≤ 15 TCU	-
Taste	No objectionable/Acceptable	-	-
Odor	No objectionable/Acceptable	-	-
Turbidity	NTU	< 5 NTU	
Total Hardness	mg/l	< 500 mg/l	
TDS	mg/l	< 1000	
pH		6.5-8.5	
Chemical			
Aluminum	mg/l	≤0.005 (P)	0.2
Antimony	mg/l	≤0.005 (P)	<0.005 (P)
Arsenic	mg/l	≤0.005 (P)	0.01
Barium	mg/l	0.7	0.3

Parameter	Unit	NEQS	WHO/IFC
Boron	mg/l	0.3	0.3
Cadmium	mg/l	0.01	0.0003
Chloride	mg/l	<250	250
Chromium	mg/l	≤0.05	0.05
Copper	mg/l	2	2
Cyanide	mg/l	≤0.05	0.07
Fluoride	mg/l	<1.5	1.5
Lead	mg/l	≤0.05	0.01
Manganese	mg/l	≤0.5	0.5
Mercury	mg/l	≤0.0001	0.0001
Nickel	mg/l	≤0.02	0.02
Nitrate	mg/l	≤50	50
Nitrite	mg/l	≤3	-
Selenium	mg/l	0.01	0.01
Residual Chlorine	mg/l	0.2-0.5 at consumer end	-
Zinc	mg/l	5	3

*: The standards highlighted in green for each respective Area/Zone are the most stringent based on a comparison between local and international regulations and thus shall be applicable for the proposed project.

3 Project Description

3.1 Project Introduction

61. The Karakoram Highway (KKH) is a major access road to Abbottabad City and district Hazara. It is widely used by public transport services, commercial trucks and private vehicles. On the way to Abbottabad from the south along the KKH is situated a 21.86 acres solid waste dumpsite in the midst of green hills and a perennial stream (Salhad Nala). The dumpsite is a source of land, air and water pollution and an eyesore for those travelling to and from Abbottabad.

3.1.1 Project Need

62. The development of Salhad Park on the existing dumpsite will turn a pollution source into an orchard and scenic stopping point for travellers. Its dense plantation, sitting spaces, café and parking space for over 70 vehicles will attract both tourists and locals to the site. The direct beneficiaries of this project will be the 1,684,233 residents of Abbottabad and Havelian and travelers of the KKH. The 36,018 residents of peri-urban Union Council Salhad will also witness positive impacts from reduction in the contamination of underlying aquifers and production of noxious fumes from open air garbage incineration. Fruit from the park's orchards will be available to the public free-of-cost. Tree plantation will also help reduce the urban heat island effect, purify the air and absorb greenhouse gases. A map showing the proposed park site is shown in **Figure 1-1**.

3.1.2 Project Scope and Objectives

63. The scope and objectives of the proposed park development provided in the **Table 3.1** below.

Table 3.1: Project Scope and Objectives

	Scope	Objectives
1	Land remediation	Removal of health hazards
2	Food service (Salhad Café)	<ul style="list-style-type: none"> ▪ Attraction point for travellers ▪ Source of income generation for park and employment for locals
3	Tree plantation (Pine Forest)	<ul style="list-style-type: none"> ▪ Adaptation to Climate Change ▪ Air pollution
4	Flowering Trees	Beautification of park and scenic view from road especially during flower blossoming season
5	Sitting spaces and play areas	<ul style="list-style-type: none"> ▪ Promotion of healthy social interaction ▪ Amusement for children
6	Public washroom and prayer area	<ul style="list-style-type: none"> ▪ To meet essential sanitation and hygiene requirements of travellers ▪ Opportunity for meditation
7	Leachate collection and storage pond & methane gas vents	<ul style="list-style-type: none"> ▪ To contain toxic fluid from underlying compacted solid waste ▪ Safe channelization of gases produced from waste decomposition
8	Parking Space	Enable tourists to stop for the scenic view

3.2 Design Methodology and Approach

64. An ecological design approach was adopted to develop the site. Interventions were proposed to ensure the following:
- Accessibility (including universal access)
 - Availability of recreational space
 - Conducive environment for women & children
 - CO₂ sequestration for climate change adaptation and O₂ production for improved air quality
 - Beautification of landscape
65. The topographic survey of the site, field observations and satellite imagery were analysed. Stakeholder consultations were held throughout the design phase and feedback from Focus Group Discussions (FGDs) were incorporated.

3.2.1 Detailed Design

66. The project layout is provided as **Figure 1.2** while the other project design features are provided below as **Figures 3.1 to 3.5**. The key project design features are as follows:

Salhad Café: The café (13,669 sq.ft) will consist of a kitchen, front counter, covered sitting area and sitting spaces under trellises for about 50 to 60 customers (Figure 1 below).

Public Washroom: 800 sq.ft wheel-chair accessible public washroom for men and women. Diaper changing tables and drinking water fountains are part of the washroom's design. Space in front of the washroom increases its visibility (Figure 2 below). **All the washrooms will be connected to septic tanks provided in the drawings.**



Figure 1: Render of Salhad Café and surrounding space



Figure 2: Public washroom & administration block

Administration Block: The block has been designed on 500 sq.ft to facilitate the work of park management staff (Figure 2 above).

Children's Play Area: 14,876 sq.ft of dedicated space with swing sets for the amusement of children (Figure 3 below).



Figure 3: Play Area for Children



Figure 4: View of orchard from gazebo

Urban Forest: 134 bottle brush trees on 39,400 sq.ft, 139 pink magnolia trees on 59,688 sq.ft and 168 cypress trees on 64,687 sq.ft (Figure 4 above).

Leachate Control & Storage System: The Salhad Bagh site is an active solid waste dumping yard for Abbottabad city. Prior to conversion into a park, further dumping of solid waste will be halted and the existing dump site will be capped/closed on a technically sound basis. Additionally, a preliminary design of the leachate control and collection management system along with the site surface and storm drainage system has been designed and included in the detailed drawings as a long term measure once the site remediation has been achieved and the conversion of the site into a park has been completed. Further details on the site remediation are provided in **Section 3.3** below.

Land Remediation and Methane Gas Ventilation System: After clearance of removable solid waste from the site and compaction of existing layers of waste, the site will be covered with a 10' layer of fill consisting of 4' layer of debris, brick ballast or aggregate and 6' layer of sweet earth. A preliminary design for the methane gas ventilation system has been designed and included in the detailed drawings.

Outdoor family area: 48,255 sq.ft of space with 15 gazebos and 33 benches (Figure 5 below).



Figure 5: Outdoor dining benches for families



Figure 6: Walking track along flower beds

Walking Tracks and Flower Beds: Hydrangea flowers (200) and roses (213) will be planted predominantly along the walking tracks of the site (Figure 6 above).

Pine Tree Forest: About 379 pine trees will be planted on 62,328 sq.ft.

Prayer Area: 1,000 sq.ft will be allotted as prayer space for travellers.

Parking Area: The 30,032 sq.ft parking area will hold a maximum of 70 cars at any given time. The parking spots will be covered in Galvanized Iron (GI) sheds (Figure 7 below).



Figure 7: Parking area with sheds



Figure 8: Main Gate

Main Gate, Ticket Booth & Guardroom: The main gate will be made out of M.S. Pipe and concrete (Figure 9 below). A ticket booth and guardroom will be located at the entrance.

Other features: 40 recycling dustbins, 9 signboards, 250 lampposts and trellises will be used to furnish the park. Visitors will be facilitated to enjoy the scenic view from the park, as shown in Figure 9 below.



Figure 9: Scenic view of surroundings from Salhad Bagh

3.3 Site Remediation

67. The Salhad Park site is an active open solid waste dumping site presently used by the Abbottabad municipal authorities for the Abbottabad city solid waste dumping. The KPCIP has proposed a new Landfill Site for Abbottabad solid waste disposal at Dhamtour and proposed development of a park on the existing dumping site in Abbottabad. However, before the present site can be converted into a park further dumping of solid waste will be halted and the existing dump site will be capped/closed on technically sound ground. It is therefore, recommended that once the new proposed sanitary landfill site is fully developed and operationalized, the proper closure of the present dumping site be initiated before conversion of the site into a park. In view of this fact, the Contractor selected for the development of Salhad Park must carry out a technical study and relevant assessments for the closure of the dumpsite.

As a first step, in accordance with international best practices on environmental safeguards, a Phase 1 due diligence assessment will be conducted and based on the findings, any further assessments will be conducted, if felt necessary.

68. The proper closure of the existing site and its related study will be the responsibility of the Contractor, selected for the development of Salhad Park since the total amount of solid waste that needs to be capped can only be estimated once dumping ceases permanently. At this stage of the project, for the guidance of the future institutions/individuals, general guidelines are provided below on how to conduct the closure study and related assessments. The Contractor selected for the project is to follow the guidelines provided.

Pre-Closure Assessment

69. The selected Contractor, prior to starting the closure of the Salhad dumping site, will carry out the following assessments:

- Review of available records, files and information regarding the dump site, since its inception;
- Evaluation of potential or existing impacts on the ecological and human environment;
- Determination of potential contaminants, if any, which could get into the local environment and the formation of appropriate mitigating and remedial measures.

Assessment Parameters

70. The selected Contractor will conduct the assessment of the site based on the following basic parameters:

- A review of the geology of the site, depth of groundwater, total volume / capacity and types of waste dumped, reports, studies, historical records concerning the dump-site operations any unusual events like fires etc or dumping of any hazardous waste;
- Review of relevant available maps, including maps of the surroundings, topographic maps, geological maps, hydrogeological maps and land use maps;
- Identification of existing land uses around the area;
- Interview of those directly involved with the operation of the dump sites, including waste pickers and residents near site;
- Inventory of existing settlements, structures and surface water bodies, springs and water wells in and around the site;
- Water samples to be taken to determine the extent of contamination;
- Determination of points of leachates seepage and ponding within and beyond the disposal facility;
- Topographic survey of the dump site, extending some distance from its boundaries;
- Geo-technical investigations of the dump to determine stability of slopes;
- Identification of sources of soil or other cover materials for the site closure;
- Determination of the depth of the waste dump;
- Determination of gas leakage within and on the areas surrounding the site;
- Conduct leachate and gas sampling.

Components of the Closure Plan

71. The selected Contractor, after conducting the site assessment, will prepare a closure plan, having the following basic components:

Site Clearing. Storage areas for recyclables, makeshift huts, and other structures within the boundaries of the disposal facility will be removed.

Site Grading and Stabilization of Critical Slopes. The most critical aspect of the closure plan is the stabilization of the usually unstable slopes within the site. The closure plan shall make provisions for the identification of areas within the dump site with potential instability. This profile shall be restructured with sustained filling to further improve the overall stability or until the desired top and side grades have been attained.

72. The exposed waste shall be compacted and the top graded to slopes ranging from 2 to 4% to prevent ponding and promote natural drainage. Side slopes can be generally set at the ratio of 1 vertical to three horizontal or gentler, depending on the nature of waste and actual site conditions.

Application and Maintenance of Soil Covers. The site will be covered with soil, inert or stable material or clay material to prevent entry of water into the waste pile and access by vectors. The final cover will be at least 60 centimeters, which includes a 15-centimeter topsoil and a 45-centimeter compacted soil. The topsoil, which is usually not compacted, shall serve as a protection layer, while the compacted soil cover acts as a barrier to reduce entry of water into the waste pile, minimizes gas migration, if any, and prevents animals from getting into the underlying waste. This layer also helps to minimize the admission of odor and supports vegetation growth.

Provision of Drainage Control System. An adequately sized canal /ditch / trench shall be constructed around the site to divert runoff. The intention is to prevent contact of the waste pile with water, thereby reducing the potential for leachate generation. The size and location of trench will depend upon the size, slope and precipitation data.

Leachate Management: The pre-closure assessment will determine the points of exit of the leachate from the waste pile, from which a canal or ditch will be built to facilitate collection. The contaminated liquid shall not be allowed to drain into streams or natural bodies of water. The collected leachate will then be allowed to evaporate or be treated through other appropriate process.

Gas Management. Vents made up of appropriate material such as PVC pipes shall be installed at selected points within the waste pile. As a general rule, these vents may be spaced 50 meters apart. A more extensive gas management program may be needed depending on the results of the assessment studies.

73. Once developed by the Contractor, the closure plan will be reviewed and vetted by supervision Consultant experts. The Consultants will check if all necessary elements are covered under the proposed plan and that the plan will have no negative environmental impacts on the surrounding area and potential visitors of the proposed park. The closure and capping of the site will only be conducted once the Consultants approve of the proposed plan.

3.4 Scope of Construction Works

55. The proposed construction works are as follows:

- **Site preparation or leveling:** The site will need to be cleaned and levelled before further processes, although the site may not need levelling. All of this depends on the planning of construction.
- **Excavation and PCC:** Excavation is the digging of trenches in the ground for making it ready for the foundation substructure of the building. After excavating the ground, a layer of PCC (Plain cement concrete) will be laid in the dug portion before placing the reinforcements for foundation.

- **Foundation:** Foundation is the lowermost part of the administration building that is in contact with the soil. It transfers the load on the building from the superstructure to the soil and needs to be extremely strong to handle the load. The reinforcement for the foundation will then be prepared after excavation and concreting is done. The level of base of foundations will be checked before pouring the concrete. The earth filling will be done in the excavated portions after the concrete foundations stabilize.
- **Plinth beam and slab:** Once the foundation is built, the ground beam reinforcements will be prepared and then concreting will be done. Later masonry will be done above the ground beam and concreting of plinth beam will be done above that. The void between the foundation and plinth level will be filled with compacted soil.
- **Masonry:** The walls will later be prepared with different materials such as bricks, concrete blocks, fly ash bricks etc. according to the prepared drawing. Masonry work is carried out with cement mortar. Cement mortar is a mixture of cement & sand. Then gaps are laid for doors and windows during the masonry work.
- **Lintel over door window gaps:** Lintels will be prepared with reinforcement and concreting to support the masonry work over the doors and windows.
- **Upper floor slab with beam or Roof structure:** The masonry work will be completed. Then the slab for upper floor will be prepared with the beams resting on the concrete columns. The reinforcements for beams and slabs are assembled and then in a single day the concrete is poured. Later curing is done.
- **Door Window framing and fixations:** Once, the covering is prepared with walls and structure, the door and window frames will be installed. Later, the doors and window panels will be fixed without finishes.
- **Rough-ins:** The electric and plumbing cables and pipes are installed in the walls and slabs such that they are concealed and not visible after the finishing work is done. The cables and pipes are left out protruding such that later they can be finished with the electric fitting and plumbing fixtures.
- **Exterior finishing:** The exterior plastering and painting is also started once the superstructure is ready. Waterproofing is also done to prevent weather effect. Cladding can also be done to enhance the elevation of the house.
- **Terrace and roof finishing:** Waterproofing is done on the terrace and usually terrazzo tiles are applied on the slabs to keep prevent passage of heat.
- **Internal finishing:** The walls are plastered, and the flooring is levelled and tiling is done. Later on, the walls are painted and tiled.

- **Wood work and Fixture fittings:** Once the construction process is done. The furniture work is started. Side by side, electric lights, switchboards and other electric fixtures are fitted. And plumbing fittings are complete in the bathrooms and kitchen areas too.

3.4.1 Construction Phase Details

Construction Schedule

74. The project construction phase is expected to last for a total of 2 years with the activity expected to commence in the third quarter of 2021 and completed by third quarter of 2023.

Construction phase activities

75. The activities to be conducted during construction phase of the project are provided below:

- **Development of Construction and Labor Camps**

76. One of the first activities to be completed by the Contractor shall be the establishment of the construction and labor camp. The Contractor will also establish construction yards and sites (including storage and batching plant), offices and a workshop.

77. The construction activity has to span over approximately twenty-four months. There shall be a number of contracts for a variety of works. The selected Contractors shall have the option to select suitable site(s) located near the project sites to establish his labor camps. If private land is selected, the contractor shall enter into contract with the private owner. During construction phase, an estimated 75-100 persons consisting of both semi-skilled and skilled human resource will be required.

78. Essential for the work bases is easy approach, availability of a suitable place for temporary storage of material and availability of water for construction in the vicinity. Presence of shade from trees close to the work bases can add to the comfort of the labor while taking rest during the hot season.

79. The location of storage materials and camps will be critical. Since the project contractor(s) will be responsible for identifying the suitable locations for storage and labor camps from the private sector, thus there will need to be clear guidelines for this process, which will need to be closely monitored by the implementing agency. As far as possible, the project design team shall be assigned the task to identify the suitable location(s) for storage of materials since inappropriate storage of materials may result disruption of the traffic movement.

80. The proposed site or already constructed buildings within project area can be used as the Contractor's camp and it shall include the following facilities:

- **Labor camp site**

- Accommodation
- Kitchen
- Dining area
- Sanitation facilities
- Septic tank

- Liquid and solid waste disposal facilities
- Generator(s), for operation when the power supply from the grid station was not available
- **Construction camp site**
 - Uncovered material storage
 - Covered material storage
 - Parking for vehicles and plant
 - Batching plant (if required)
 - Generator(s)
 - Site offices
- **Workshop site**
 - Workshop
 - Storage area
 - Generator(s)
- **Site preparation**

81. There may be a need to carry out cutting and filling of the land in order to attain the designed ground elevation. During the process, areas above the design elevation shall be cut and spoils shall be used to fill areas below the designed elevation. The area is to be clean of any obstructions in areas where the general design elevation is already attained. Cut and fill activities will be carried out using mostly heavy mechanical equipment. Manual labor will be negligible.
82. The ground will be compacted until the desired ground bearing capacity is attained. This is to ensure that all structures, particularly the foundations to be erected are stable and will not be subject to subsidence, settlements and other earth pressures.

- **Associated Construction Works**

- Construction of Salhad Café, admin building, public wash rooms and children play area;
- Construction of leachate storage pond of 33x23x6 ft;
- Land remediation activities and methane gas venting system;
- Construction of walking tracks, outdoor family area, prayer area, flowering bed and parking area;
- Tree plantation.

Construction Machinery Requirement

83. For storing materials, stocking equipment and parking machinery and vehicles, the Contractor(s) shall require open and accessible sites close to the labor camps. The Contractor(s), at his own expense, but keeping in view his contractual obligations to honor the applicable national and international guidelines regarding level of pollution, shall make the arrangements.

84. The **Table 3.2** below outlines the approximate number of major machinery and vehicles that are envisaged to be required for the project construction works.

Table 3.2: Estimated Contractor's Equipment and Machinery

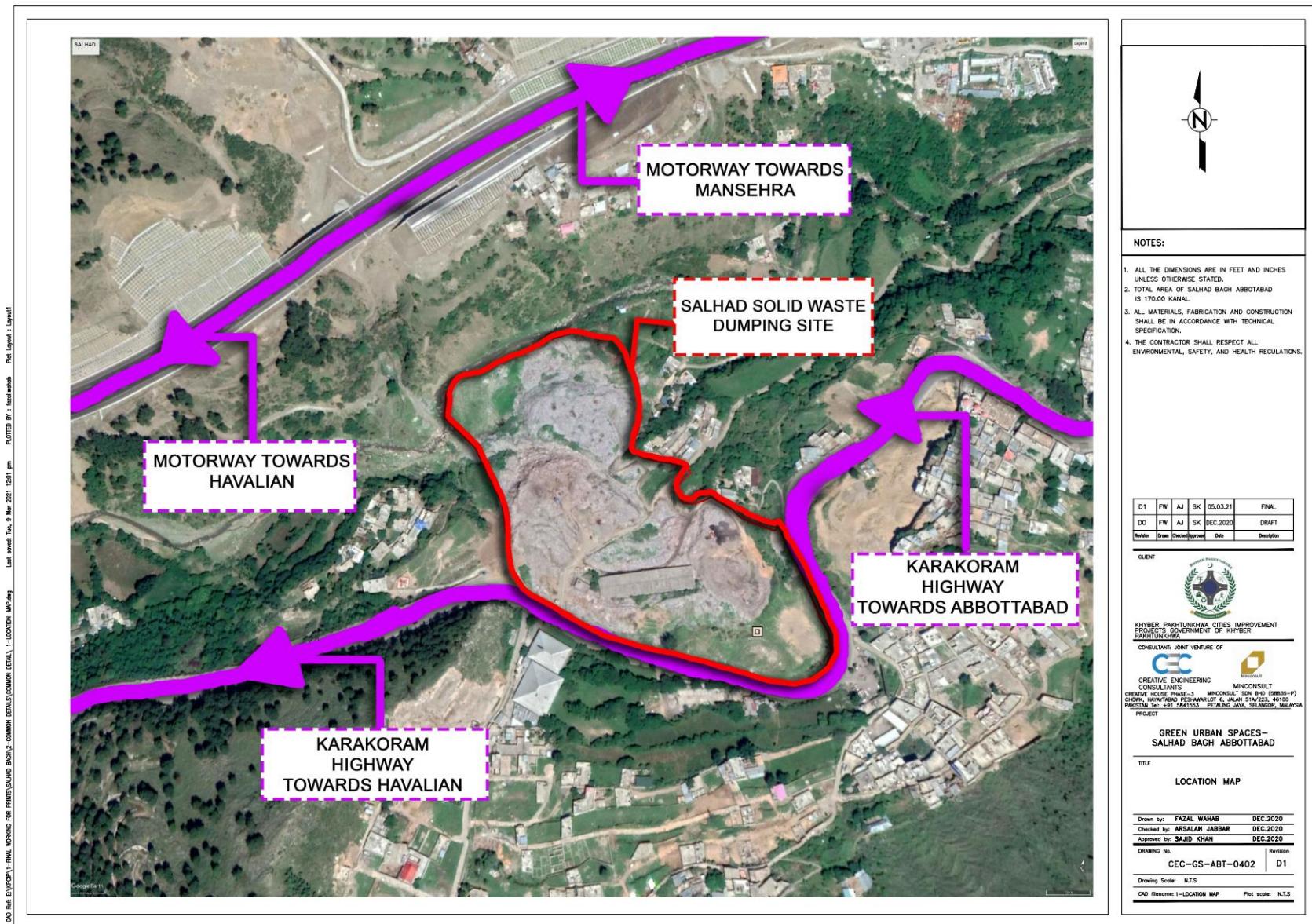
Sr. No.	Machinery / Equipment	Quantity required*
1	Excavators	2
2	Batching Plants	2-4
4	Loaders	1
5	Power Generators	2
6	Tractor Trolley	2
7	Compactor / Roller	1
8	Crane	1
10	Concrete Pump	1
11	Vibro Hammer	1
13	Watering Tanks (moveable)	1
14	Cars/Pickups	4

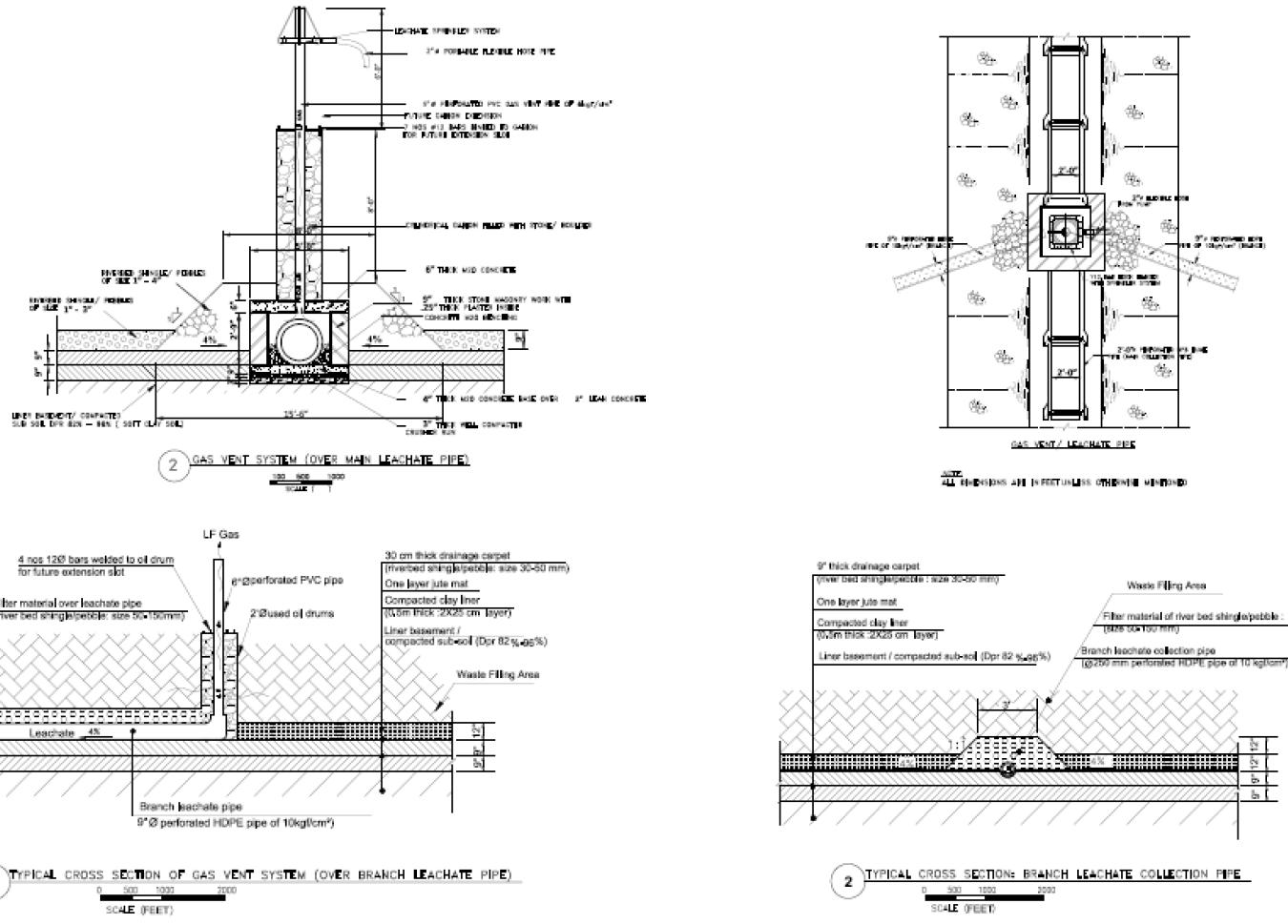
* Number of machinery is indicative and can be changed subject to working schedule.

Construction Materials Requirement

85. During the construction phase, construction materials in considerable volumes will be required. Typical material required for park development of this scale and scope are generally available locally. The common source of the material required for civil works are described in **Table 3.3** below.

Figure 3-1: Accessibility Map to Project Site





NOTES:

01	Fw	A/	SK	05.03.21	Final
00	Fw	A/	SK	E0.2020	Draft
Date	Year	Revised	Approved	Init.	Designate



KHED PAINT UPHOLSTERY IMPROVEMENT
PROJECT GOVERNMENT OF KARNATAKA
PAINT UPHOLSTERY

CONSULTANT JOINT VENTURE OF
CEC  **MINDS S.LT**
CREATIVE ENGINEERING
CONSULTANTS **MINDS S.LT**
**CEC HOUSE, HAVE-1, MINTONI LRT, JLN 10/30 (8822-7)
 BANDAR HAYAMBIKAI, KUALA LUMPUR, 58120, MALAYSIA
 FAX: +603 9051 45000**
CEC TRUNK LINE: +603 9051 4553 **REGISTERED OFFICE:** **CEC PROJECT**

GREEN URBAN SPACES—
SALHAD BAGH

GAS VENTILATION SYSTEM

Entered by:	FAZAL WAHAB	DEC.2020
Checked by:	ABDUL AHMAD	DEC.2020
Approved by:	SABIR KHAN	DEC.2020
Designation:	Revised	
CEO-GS-ABT-0452c		D1
Drawing Scale:	N.T.	
GDS Reference:	File no. N.T.	

Figure 3-3: Leachate Control at Project Site

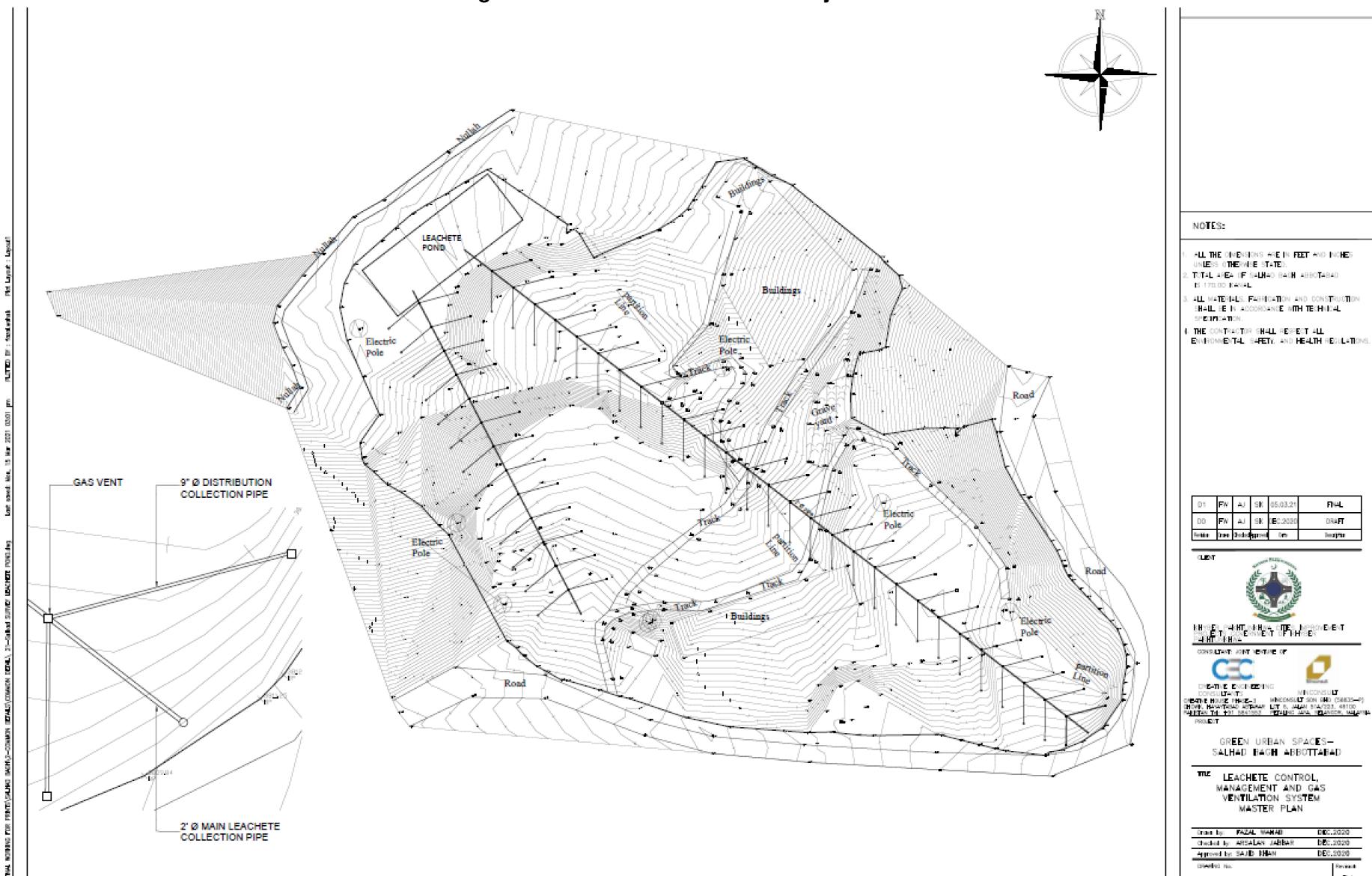


Figure 3-4: Admin Block Layout

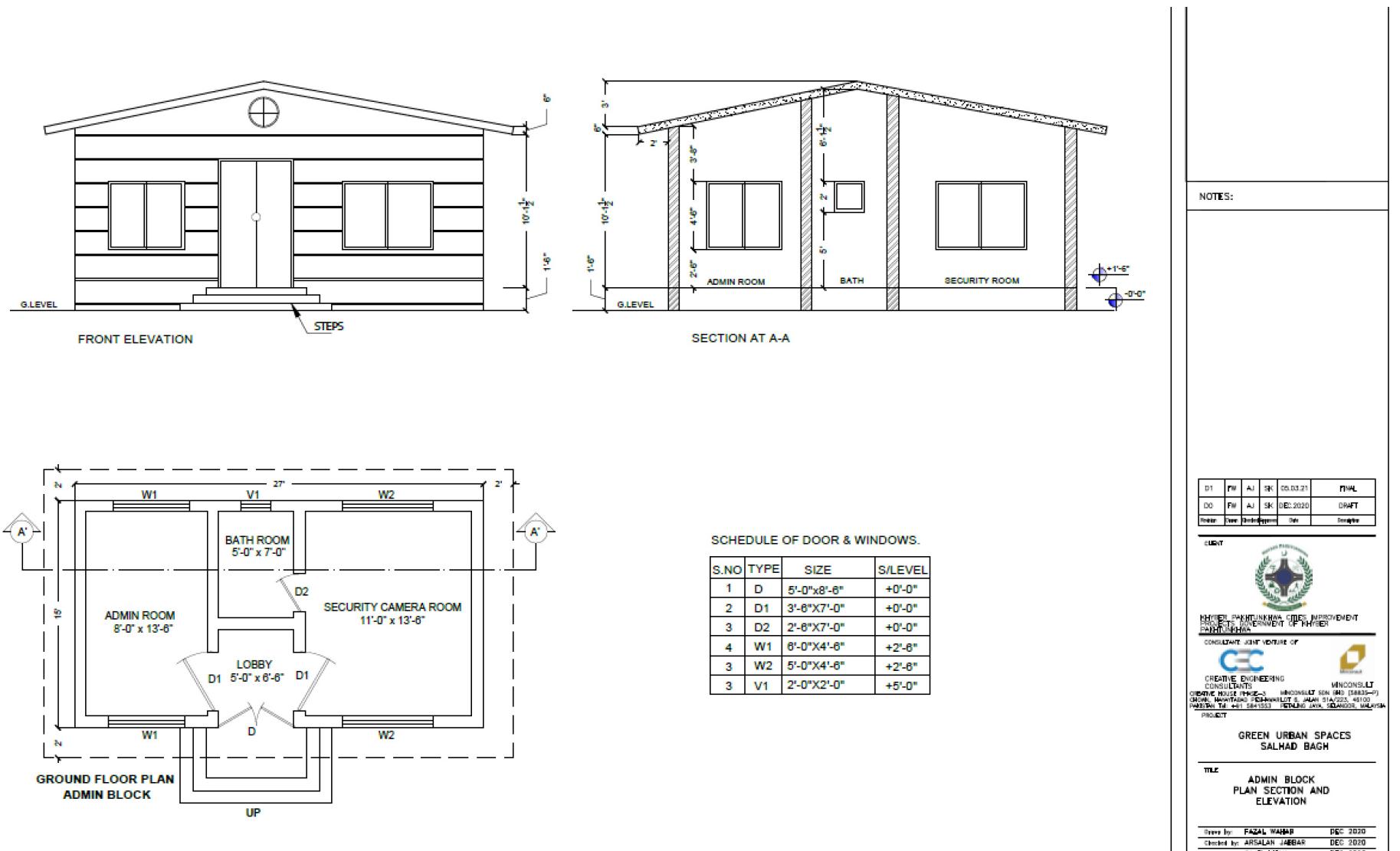


Figure 3-5: Gazebo Plan

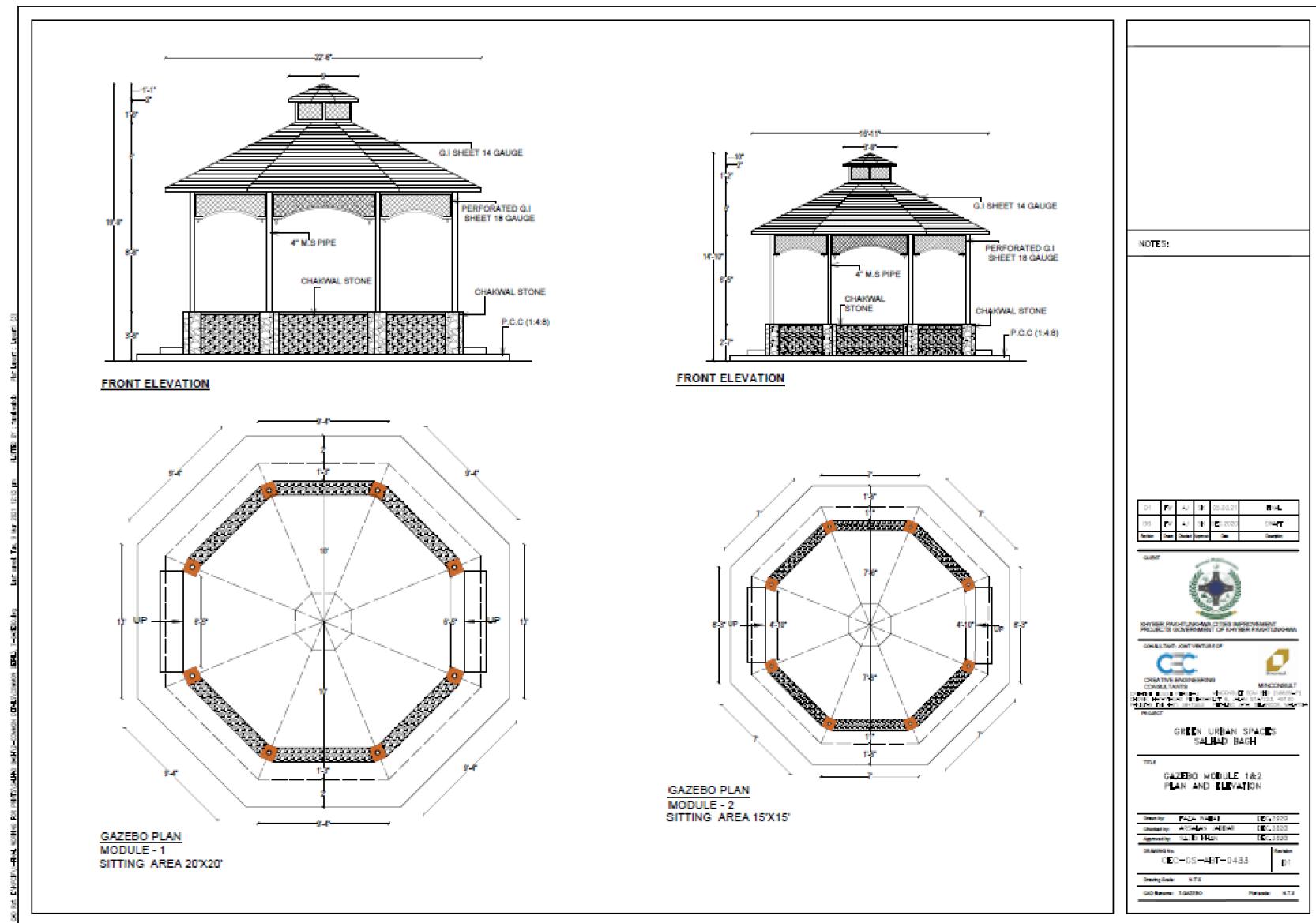


Table 3.3: Source of Raw Material

Sr.#	Raw Material	Source
1	Earth Material	Available locally, borrowed from the lands acquired for the project.
2	Aggregate	Available at many sources within the vicinity of the site.
3	Rip-rap material	Available locally from nullah bed deposits and rock excavations.
4	Sand	Sand is available in near vicinity and river bed.
5	Water	Ground water is available at depth of 170-190 feet and it will be used for construction purpose. At construction stage, the Contractor will be advised to minimize water usage as far as possible and to also consider using any nearby surface water source, if considered feasible from technical and economic standpoints.
6	Cement	Ordinary Portland Cement is suitable, which is available at various factories in Pakistan mainly from Haripur
7	Reinforcement steel	Steel re-rolling mills in Peshawar meeting the standards from the billet produced either by Pakistan steel or imported. These will serve the purpose of steel availability.
8	Energy	Electricity supplies are available at the site through WAPDA grid.

3.4.2 Operation Phase Details

Scope of Activities

86. The park will be a recreational area for the residents of Abbottabad and neighboring areas and will offer food service (Salhad Café), sitting spaces, children play areas, outdoor family area, public washroom, prayer area and parking space to its visitors. Estimated manpower requirements during operation phase would be 50 persons.

3.5 Climate Risks of Project

3.5.1 Climate Change Trends and Extremes in Abbottabad

87. Main climate change impacts in Abbottabad are highly associated with potential increase in rainfall and increase in temperature (both maximum and minimum temperatures). These potential changes will result in an increase in flooding (riverine, flash and urban flooding) and increase in heat waves (particularly in densely populated UCs and industrialized areas). In addition, high speed winds are also anticipated due to mini-cyclones/ high intensity wind storms. These will impact businesses, domestic homes, agriculture and exacerbate the challenges associated with urban and transport infrastructure development, energy consumption, energy supply and municipal services (like water supply, sanitation systems, sewerage systems, drainage and community health). Climate change projections along with associated impacts and their likelihood are mentioned in

Table 3.4. Summary of the main Climate Change trends and projections observed in Abbottabad are mentioned in **Table 3.5.**

Table 3.4: Climate events in Abbottabad and their impacts on the city

Climate Change Projection	Event	Impact	Likelihood
Extreme precipitation	Flash flooding	Damage to houses, infrastructure.	High
	Urban flooding	Increased demands on drainage and storm water management system and sewer outflows	
		Road washouts and flooding	
Heavy rain and temperature changes in the catchment of Salhad and Naray streams	Increased precipitation resulting in flooding in the streams	Higher cost of flood protection, maintenance and expansion of man-made erosion controls	Medium
Temperature rise	Increased snow melt, Increased precipitation/evaporation	Increased flooding Increased water demand Increased energy consumption Decline in surface and ground water resources	High

Table 3.5: Sum mary of the main Climate Change Trends and Projections observed in Abbottabad

Climate Trend	Description	Current and/or future impacts
	Based on CSIRO-CCAM RCM precipitation is expected to rise between 113.8mm/yr. to 329.5mm/yr. during 2011-2100 compared to 1976-2005 period under both scenarios.	Flash floods may increase, which will adversely affect the ground water. Groundwater will continue to decline. Runoff increase adversely effecting ground water. Together with temperature rise, decrease in precipitation may result in more soil erosion and slope instability.

Climate Trend	Description	Current and/or future impacts
Temperature Increase	<p>Maximum temperature is also expected to rise between 0.06°C to 6.2°C during 2011-2100 compared to 1976-2005. Similarly, minimum temperature is expected to rise between 1.2°C to 4.9°C during 2011-2100 compared to 1976-2005.</p>	<p>Increased demand for water and electricity, putting an additional pressure on the stretched supply of both.</p> <p>Temperature rise will enhance evaporation and losses. It will also adversely impact structural design and urbanization.</p> <p>Adverse changes to the ecosystem, local flora and fauna.</p> <p>Frequent heat waves associated with health impacts.</p>
Precipitation Increase	<p>Based on CSIRO-CCAM RCM precipitation is expected to rise between 113.8mm/yr. to 329.5mm/yr. during 2011-2100 compared to 1976-2005 period under both scenarios.</p>	<p>Flash floods may increase, which will adversely affect the ground water. Groundwater will continue to decline.</p> <p>Runoff enhancement in the near and far future again adversely effecting ground water.</p> <p>Together with temperature rise, decrease in precipitation may result in more soil erosion and slope instability.</p>

3.5.2 Climate Risk and Vulnerability Assessment

88. Climate change can impact different aspects of the project activities due to projected increased temperatures and intense floods from heavy rainfalls which may cause landslides and affect the park infrastructure.

3.5.3 Climate Change Mitigation and Adaptation Measures

89. The park design has included climate change mitigation and adaptation measures in the design as land remediation and conversion into a recreational park will improve the environmental, air quality and aesthetic quality of the area. Additional plantation of 1,064 trees and 1,052 shrubs and flowering plants will add in to the site to increase the green cover of the area and add to the climate resilience of the area.

4 Description of Environment

90. This section examines the existing environmental conditions of the project area to provide a baseline against which the project impacts can be measured and monitored in future. This chapter also identifies sensitive flora, fauna and ecosystems in the project area.
91. The information provided in this section is both quantitative and qualitative and is based on primary and secondary data sources. While primary information was collected through field surveys conducted specifically for this study by PMU and EDCM consultant for IEE baseline survey in July, 2020. Secondary information is from desk studies related to the project area and the design study carried out for the park development.
92. The description of the environment is site-specific and includes the information of physical environment including topographic condition, geological setting, water quality (surface water and groundwater), ambient air quality, climate of the area, land use, description of ecological habitats, located in the overall environmental study area and socio-economic conditions of the area.
93. With due regard to baseline environmental conditions, the impact of project interventions is addressed and mitigation measures are proposed in the foregoing sections. The baseline information also assists in identifying specific issues to be monitored during project implementation as well as during the operational phase.

4.1 Physical Environment

4.1.1 Topography

94. The topography of the project area (Abbottabad) is predominately sub mountainous, eroded by intervening flat valleys, which are fertile and partially irrigated by canals or by lifting groundwater through tube wells. Along the northern boundary of the district, a series of low lying hills form barrier to the Mangal tract in district Mansehra. To the south of these hills, Orash or Resh plains lie with an area of about six square kilometers. Another such tract is Dhan which is an elevated basin enclosed by Nara hills.
95. The proposed project site consists of a mix of even and uneven sloping terrain, made more uneven due to the waste dumping at this site.

4.1.2 Soils

96. The ground in general in Abbottabad comprises of Stiff to Very Stiff to Hard Silty Clay with Gravels/Silty Clay/Poorly Graded Gravels with Silt/Limestone up to maximum investigated depth of 20m below EGL.
97. The soils are generally classified as granular indicated fines (passing # 200 sieve) ranging from 3% to 25%. The fine content in the cohesive soils were indicated as 54% to 87%.

Geologic Setting

98. The geologic formations of the Abbottabad range in age from Precambrian to Quaternary and include sedimentary, igneous, and metamorphic rocks and unconsolidated material with the geology in the project area shown as **Figure 4.1** below.

Lithological Description

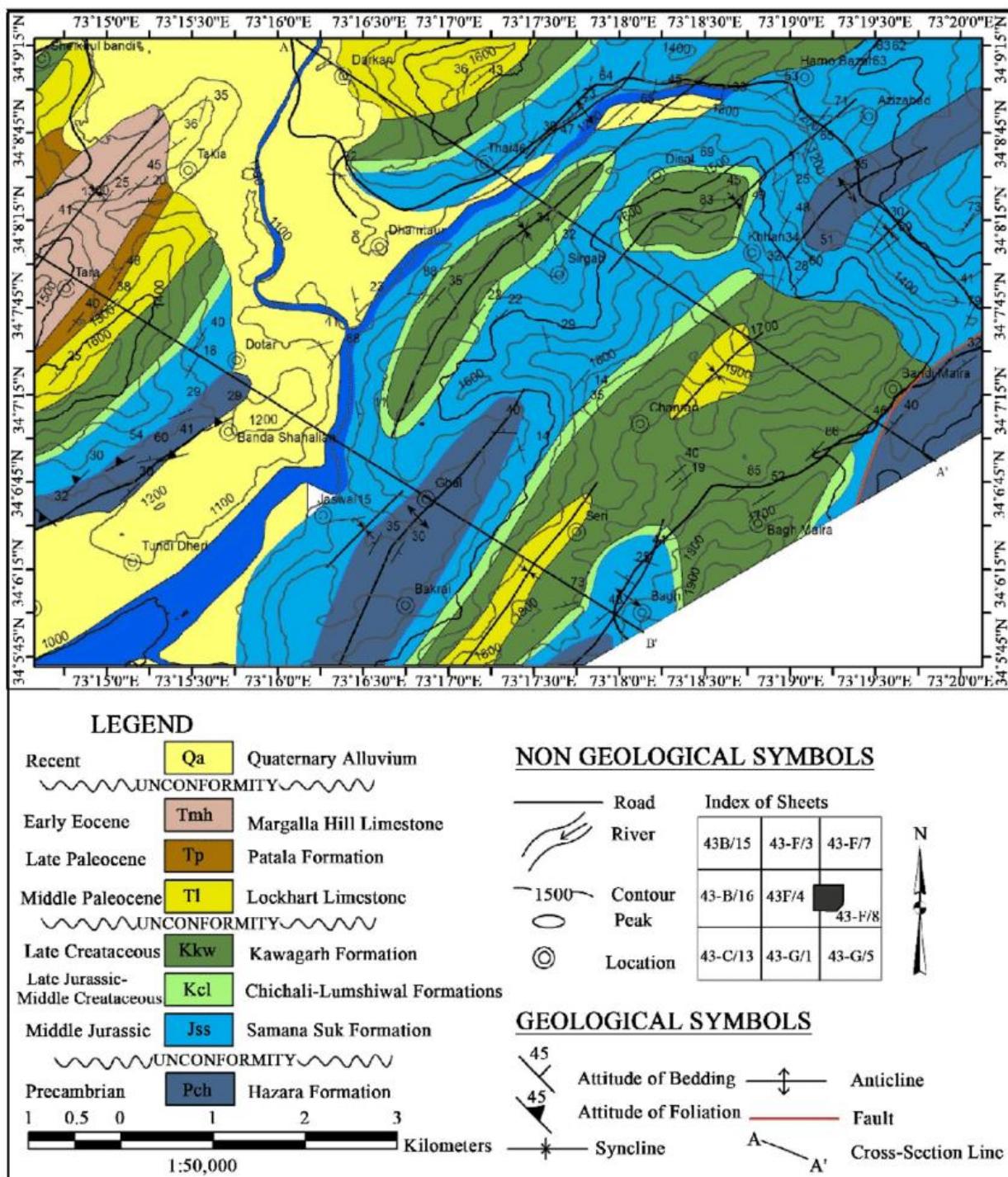
99. The Hazara Formation in Abbottabad consists mainly of slate, phyllite, un-metamorphosed shale, and a few layers of limestone and graphite. Slate and phyllite are dark gray, dark green, or black on the fresh surface and rusty brown or dark green on the weathered surface. Slate units consisting of sill-sized material are somewhat lighter toned than those of clay-sized material, and in places they are crossbedded. Layers of thick-bedded fine to medium-grained graywacke sandstone are found locally, but sandstone is not common.
100. Limestone beds totaling as much as 500 feet in thickness and a sequence of calcareous phyllite and gypsum ranging from 100 to 400 feet in thickness are found in two separate zones that extend from Muzaffarabad to Kohala. These beds are gradational with the enclosing slate and phyllite and are an integral part of the Hazara Formation. In the Tarbela area, the Hazara Formation likewise contains a few layers of limestone as well as graphite, graphitic limestone, and calcareous shale.

Ground water

101. In general in Abbottabad in the recent past, no Ground water has been encountered during excavation of test pits upto 20 meters.

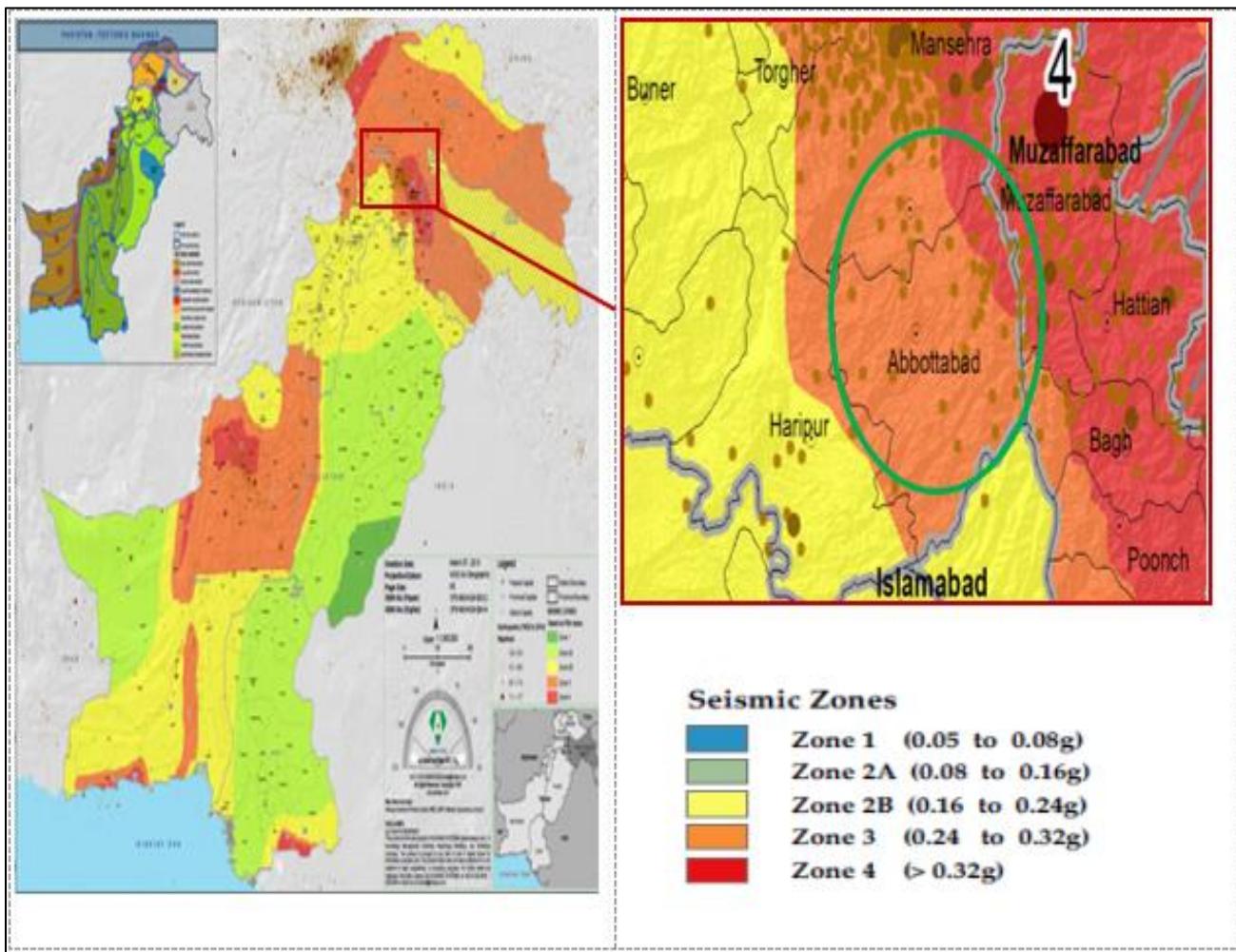
4.1.3 Seismicity

102. Seismic zoning map of Pakistan showing proposed project site area is presented as **Figure 4-2**, indicating zones according to the Building Code of Pakistan - 2007. The project site falls in Seismic Zone 3 with peak ground acceleration of 0.24 to 0.32g, according to the Seismic Zoning Map of Pakistan. It is therefore, recommended that the project structures shall be designed to cater for the requirements of Zone 3 of Building Code of Pakistan (2007).

Figure 4-1: Geology of Project Area²

2

https://www.google.com/search?q=Geology+of+Dhamtor+area&rlz=1C1GCEU_enPK927PK927&sxsrf=ALeKk01QIJM5JzNfytFbEzZHBKAjbspFgQ:1620723479126&source=lnms&tbo=isch&sa=X&ved=2ahUKEwip_oG6oChwAhX1nVwKHZ_jAUMQ_AUoAXoECAEQAw&biw=1280&bih=580#imgrc=i9SKZ8F-QwOCzM

Figure 4-2: Seismic Zoning Map of Pakistan³

4.1.4 Climate

103. The Köppen Climate Classification subtype for this climate "s ""fa". (Humid Subtropical Climate). The climate is mild, and generally warm and temperate. Abbottabad is a city which receive significant rainfall as compared to other cities of Pakistan.

Temperature

104. Abbottabad has a humid subtropical climate, with mild to warm temperatures during the spring and autumn months, hot temperatures during June and July, and cool to mild temperatures during the winter. The temperature can rise as high as 38 °C (100 °F) during the mid-summer months and drop below –5 °C (23 °F) during the extreme cold waves. The average annual temperature in Abbottabad is 18.0 °C | 64.3 °F.

³ National Disaster Management Authority

Changes in Mean Temperature in Abbottabad

105. Winter months (December to March) and August maximum temperature data show statistically significant rising trends during 1971-2015. The trends range between 0.03°C/month/yr. to 0.087°C/month/yr. (for February and March respectively). The data from PMD shows a rise in maximum temperature between 1.3°C to 3.8°C during the last 45 years. Annual maximum temperatures have risen at 0.018°C/year (with a total rise of 0.82 °C during 1971-2015). Minimum temperature shows a rise during February, March and August. Monthly rise in minimum temperature ranges between 0.52°C (for August) and 1.5°C (for March) during 1971-2015⁴.

Rainfall

106. The annual rainfall is 1262 mm | 49.7 inch. Winters, are comparatively severe, with heavy snowfall in the higher elevations causing the snowline to drop to around 1,650 m. Heavy rainfall occurs during the monsoon season stretching from July to September that frequently results flooding in lower lying parts of the city.

Changes in Mean Precipitation in Abbottabad

107. Monthly precipitation data shows a statistically significant decline during January, March, April, May and July. January precipitation data shows maximum percentage decline (about 1.25% decline/month/yr.) with a total decline of about 68mm over a 57-year period. Annual precipitation in Abbottabad shows a declining trend. It is noteworthy that a total of about 577.6 mm decline occurred during 1957-2015 (59 years) at a rate of 9.78mm/yr. (about 0.6%/yr.)⁵
108. Climatic data of Abbottabad for the year 2019, and 2018 is given as **Table 4.2**, **Table 4.3** while **Figure: 4-3** showing 3 Year Temperature Variation of district Abbottabad and **Figure 4-4**, showing 3 Year Precipitation Variation at District Abbottabad. **Figure 4-5:** a), annual maximum temperature during 1971-2015 (b), annual minimum temperature during 1971-2015

Relative Humidity

109. Abbottabad observe some very humid and moderately humid months. The least humid month is May (43.8% relative humidity), and the most humid month is August (74.1%)⁶. As compared to other cities of Pakistan the precipitation effectiveness index (P.E) level of Abbottabad is high as it falls in wet zone.⁷ Historic Average Relative Humidity Levels for Abbottabad is given in **Table 4.4**.

⁴ Pakistan Meteorological Data Balakot Climate Station (PMD)

⁵ Monthly precipitation data of Balakot station has been acquired from Pakistan Meteorological Department (PMD) for a period 1957-2015 (59 years).Monthly maximum and minimum temperature data of Balakot station have also been acquired from PMD for the period 1971-2015 (45 years). Both these datasets have been used for baseline climate data analysis.

⁶ [https://championtraveler.com/dates/best-time-to-visit-abbottabad-pk/#:~:text=Humidity%20and%20Wind,month%20is%20August%20\(74.1%25\).](https://championtraveler.com/dates/best-time-to-visit-abbottabad-pk/#:~:text=Humidity%20and%20Wind,month%20is%20August%20(74.1%25).)

⁷http://www.pmd.gov.pk/rnd/rnd_files/vol6_issue11/5_Climatic%20Zonation%20of%20Pakistan%20through%20Precipitation.pdf

Wind Rose

110. The wind rose for Abbottabad shows how many hours per year the wind blows from the indicated direction. The wind rose for Abbottabad city (provided as **Figure 4.6**) shows that the predominant wind direction is West-South-West and South-West.

Ambient Environment

111. Abbottabad's environment has suffered tremendously due to an ever-increasing population, unplanned growth and a poor regulatory framework. Air and noise pollution is a significant issue in several parts of the city, and the water quality, once considered to be exceptionally good, is also deteriorating at a fast pace. Works on the site remediation, followed by the park development, will increase dust and particulate matter within the vicinity. However, this activity will be short term in nature and dust management plan shall be followed to reduce impact on ambient air. Furthermore, the long term impacts once the site has been remediated and the waste dumping has been stopped will be extremely positive. Details of ambient noise and air quality of proposed project area have been summarized in later sections. Lab reports are attached as **Annexure D**.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C	11.9	13.7	18.4	23.2	28.3	32.9	30	28.1	27.8	24.9	19.7	14.7	22.8
Daily mean °C	6.7	8.5	12.8	17.3	22	26.5	25	23.6	22.4	18.5	13.5	9.2	17.2
Average low °C	1.6	3.3	7.3	11.5	15.7	20.2	20.1	19.2	17	12.2	7.3	3.7	11.6
Average rainfall mm	76	103	122	98	68	75	251	243	97	42	28	47	1250

*Source Meteorological Data of District Abbottabad (Kakul).

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Average high °C	14.5	16.3	21	25.8	30.9	35.5	32.6	30.7	30.4	27.5	22.3	17.3	25.4
Daily mean °C	9.3	11.1	15.4	19.9	24.6	29.1	27.6	26.2	25	21.1	16.1	11.8	19.8
Average low °C	4.2	5.9	9.9	14.1	18.3	22.8	22.7	21.8	19.6	14.8	9.9	6.3	14.2
Average rainfall mm	79	106	125	101	71	78	254	246	100	45	31	50	1286

*Source Meteorological Data of District Abbottabad (kakul).

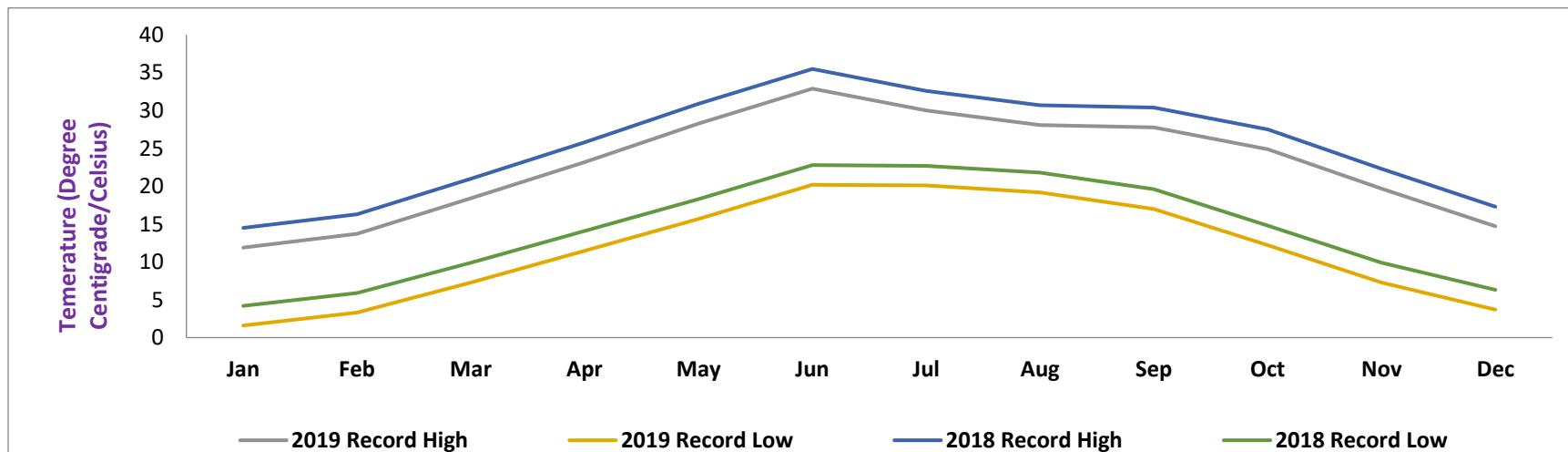
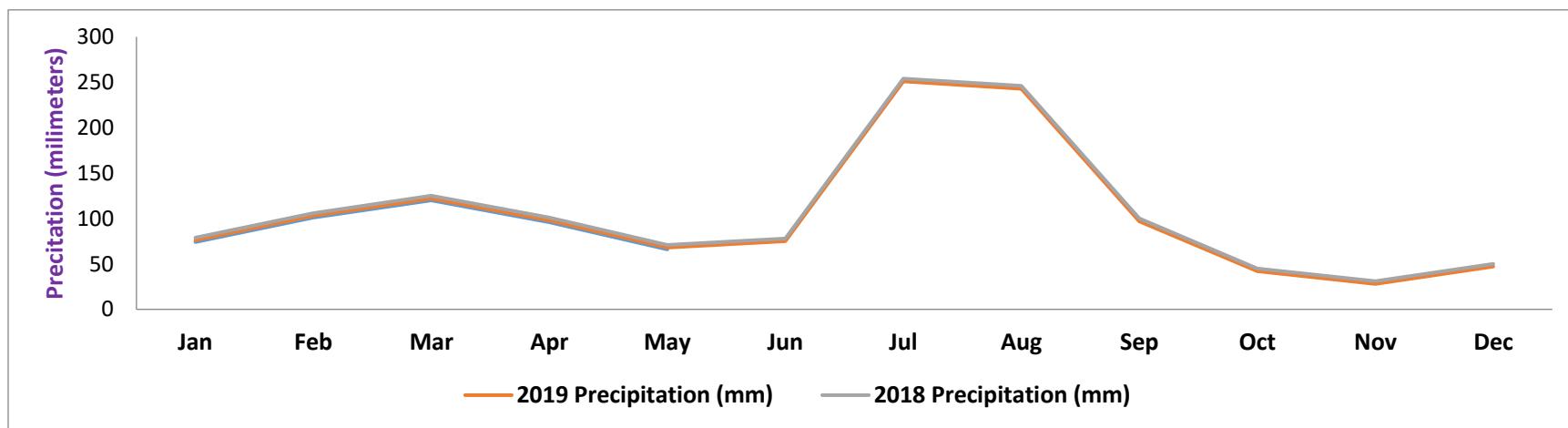
Figure 4-3: 3 Year Temperature Variation of District Abbottabad**Figure 4-4: 3 Year Precipitation Variation at District Abbottabad**

Figure 4-5: a), annual maximum temperature during 1971-2015 (b), annual minimum temperature during 1971-2015

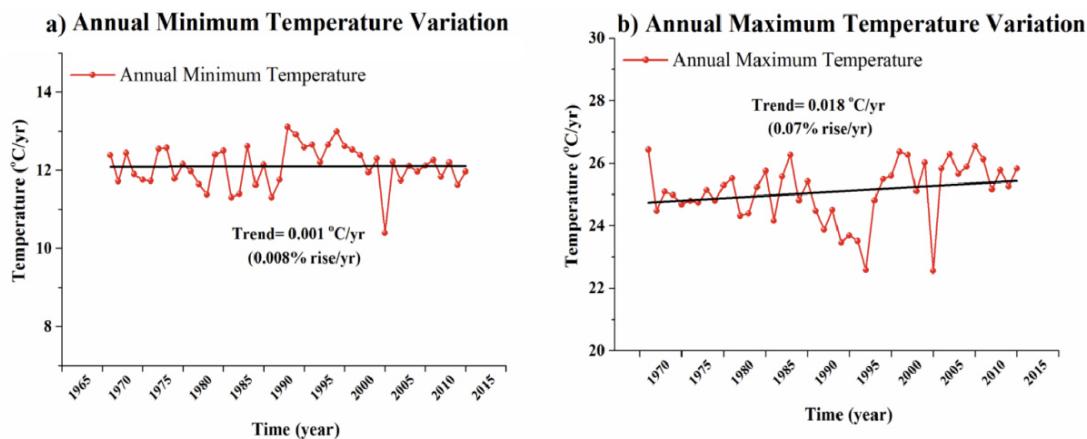
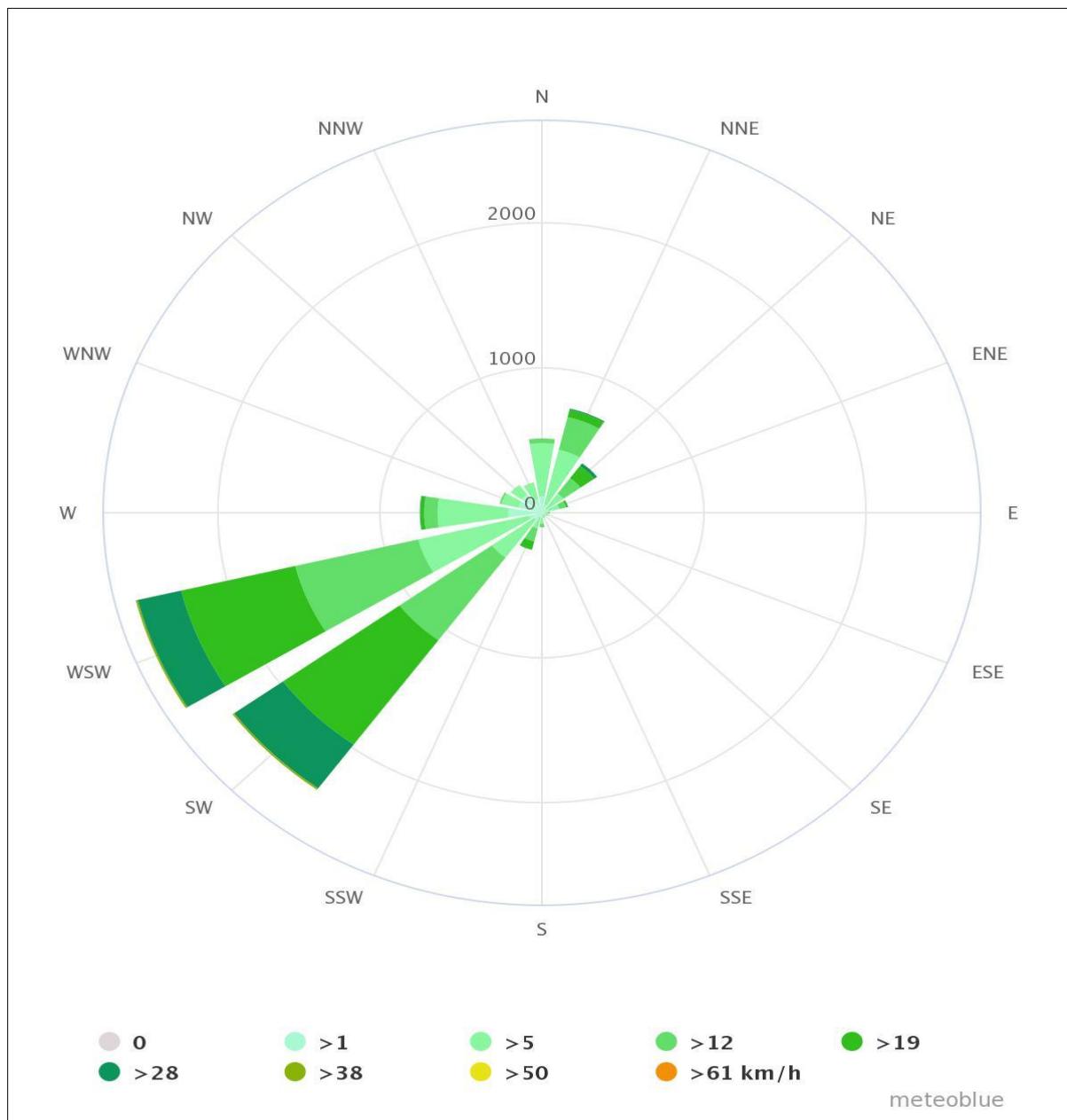


Table 4.3: Historic Average Relative Humidity Levels for Abbottabad

Month	Avg. Relative Humidity
January	50.3%
February	61.2%
March	54.1%
April	53.8%
May	43.8%
June	47.7%
July	66.1%
August	74.1%
September	65.3%
October	52.6%
November	48.6%
December	48.7%

Source: <https://championtraveler.com/>

Figure 4-6: Wind rose for Abbottabad

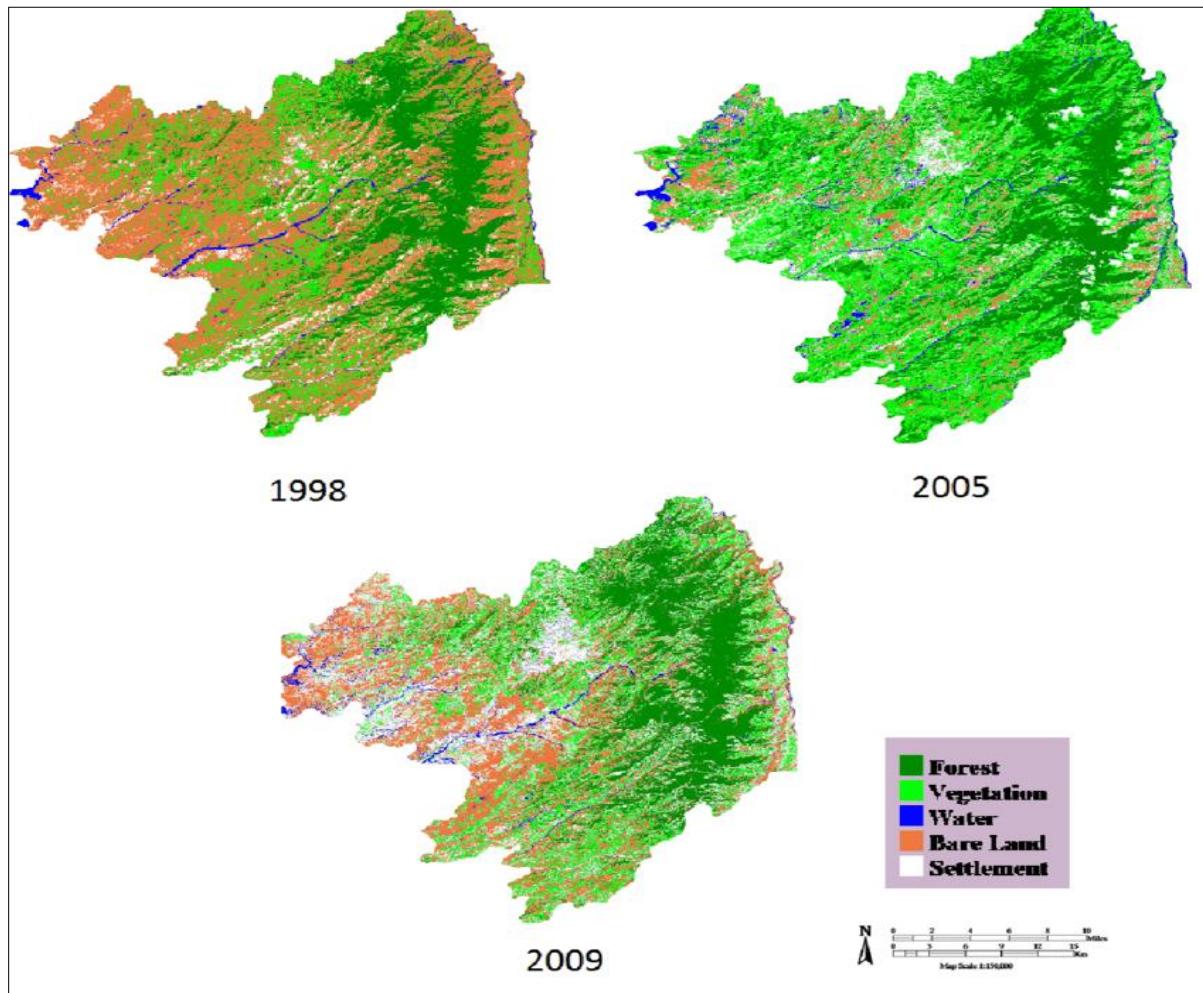
Source: meteoblue.com

4.1.5 Land Use

112. The district Abbottabad has gone through extensive land use changes in the last decade due to accelerated developmental and educational advancements, urbanization, and a major earthquake of 2005.
113. Auriba Raza, Ifthikhar A Raja, Shahid Raza, (2015) conducted a study on Land-Use Change Analysis of District Abbottabad Pakistan Taking Advantage of GIS and Remote

Sensing⁸. Results of this study shows that Abbottabad has undergone a noticeable land-use change due to the different demographic, environmental and natural, and anthropogenic factors. Earthquake 2005 played a major role in land-use change. Results show that from 1998 to 2009 the vegetative land and bare land decreased while the areas of settlement, forest, and water area increased. The vegetative land decreased by 1.053%, bare land by 1.394%, settlement, forest and water area increased by 9.29%, 2.82%, and 0.33%, respectively. Major portion of vegetative land and bare land was converted into settlements.

Figure 4-7: Land use pattern of district Abbottabad during 1998-2009



114. As seen from **Figure 4-7** there has been a considerable change during 11 years period. Forest and settlement have increased in the area by 2.83% and 9.3%, respectively, whereas bare land has decreased significantly in area by 11.4%. Forest and vegetation in the area first increased in 2005 and then decreased in 2009. Increase in the forest and vegetation is due to the extensive Shajar Kari Mohim (plantation) in 1998 to improve the forest area. Decrease in the later years is attributed to the increase in the built up area

8

https://www.researchgate.net/publication/267957472_LANDUSE_CHANGE_ANALYSIS_OF_DISTRICT_ABBOTTABAD_PAISTAN_TAKING_ADVANTAGE_OF_GIS_AND_REMOTE_SENSING

and earthquake 2005 triggered landslide that eroded much of the green land with it and left large portion of the land barren.

115. Land use distribution map of 2 km radius around project location has been shown in **Figure 4-8**. The analysis of land use indicates that there is considerable crop land around the park site along with scattered concentrations of residential properties of varying sizes, almost all of them at respectable distances away from the site perimeter.

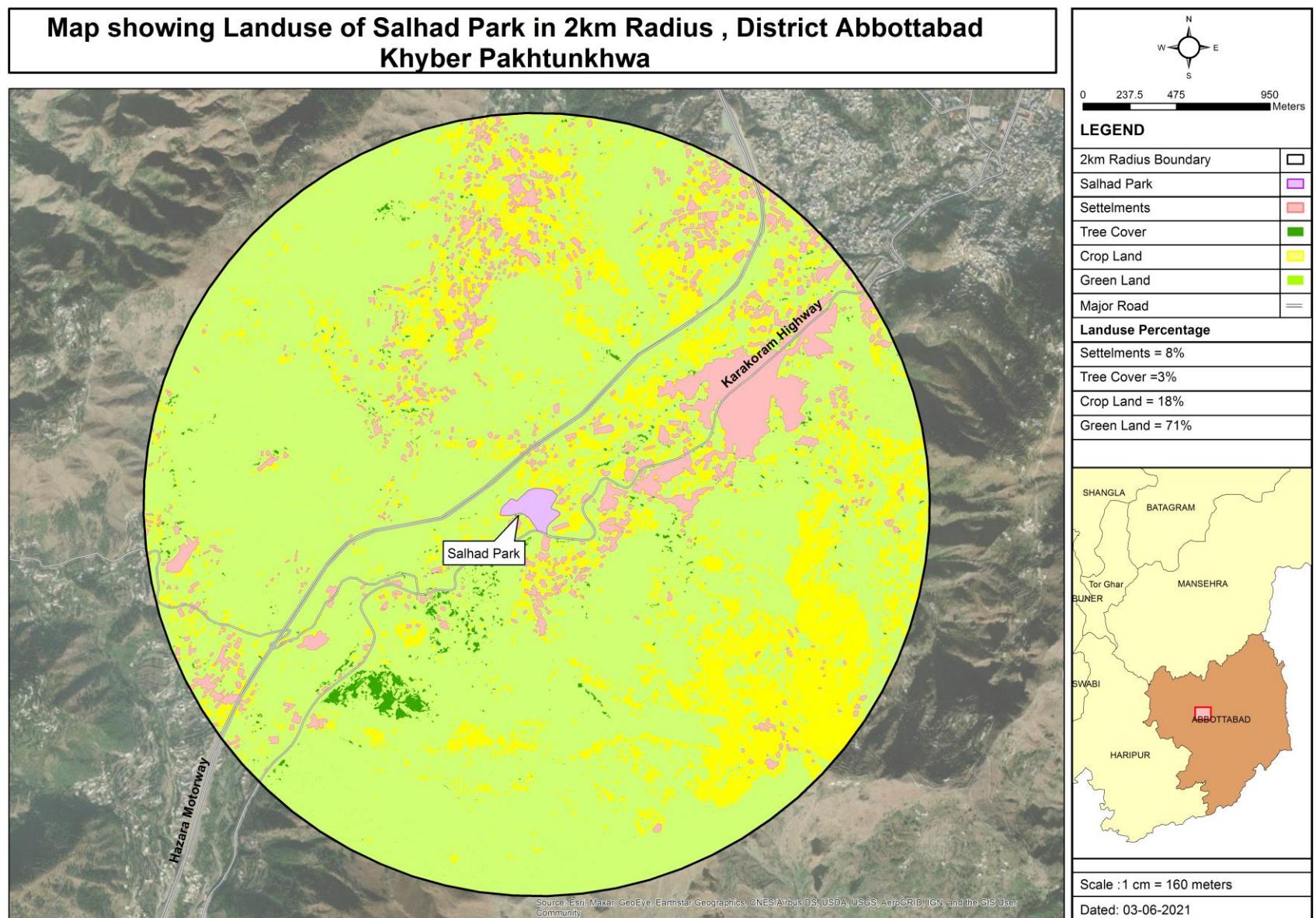
Figure 4-8: Land use map of project area in 2km radius

Figure 4-9: Surface Water Body Map

**Map Showing Location of Salhad Park & Natural Waterway, District Abbottabad
Khyber Pakhtunkhwa**

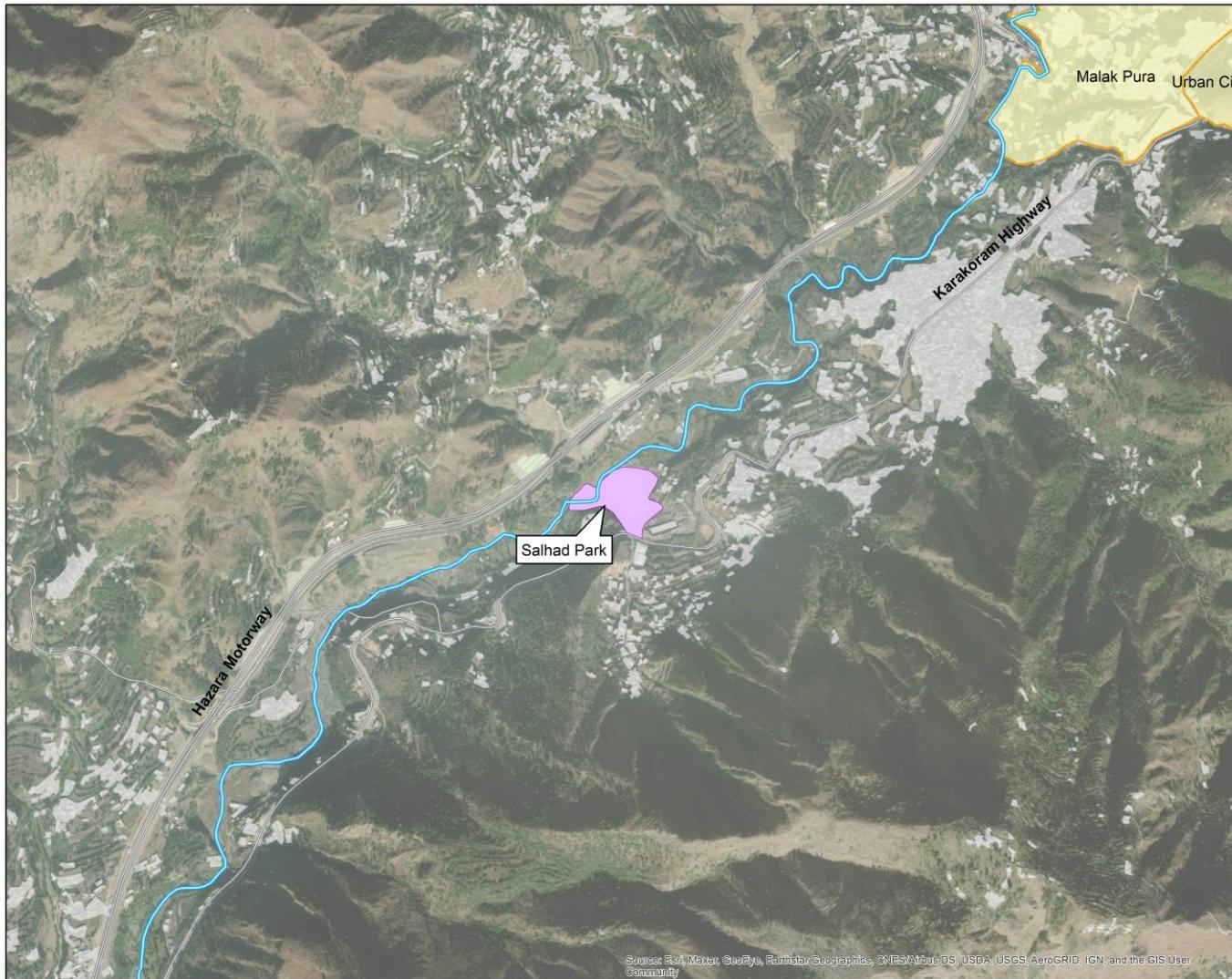
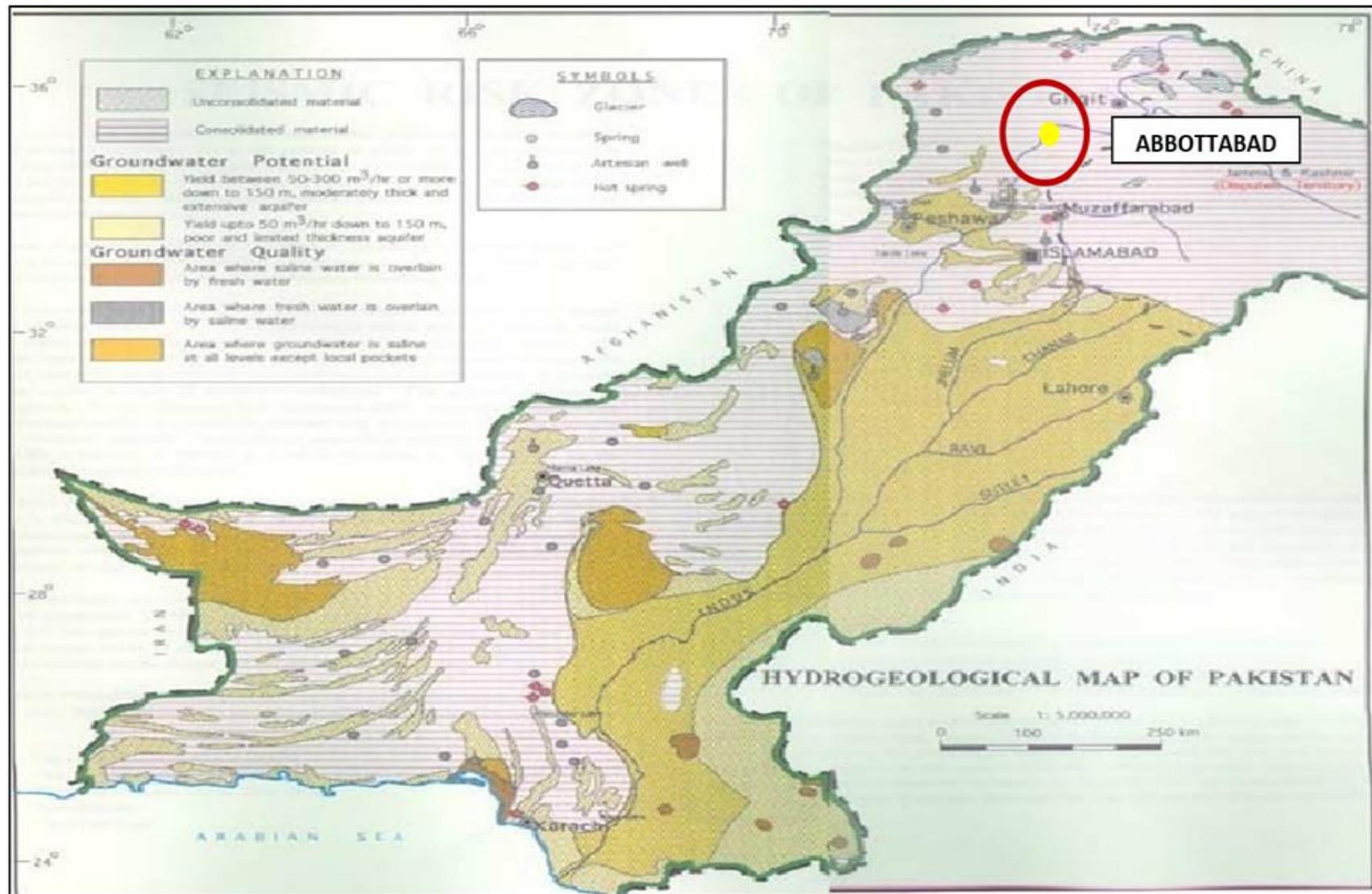


Figure 4-10: Hydrological Map of Pakistan



4.1.6 Surface water

116. The Salhad nullah is a perennial stream that flows all year round and passes through the north-western part of the proposed site as can be seen in **Figure 4-9** above. The hydrological map of Abbottabad is also provided as **Figure 4-10** above.

117. Based on review of secondary data, the following has been reported in published literature⁹:

"The influence of leachate from open solid waste dumping near Salhad stream (Abbottabad, Pakistan) was investigated to quantify the variations of water quality during August 2007 to April 2008. Samples were collected from five different sites located along the Salhad stream. Two sites were located before the mixing of solid waste leachate with the surface water. One sampling site was of leachate and other two sampling sites were affected with solid waste leachate. Samples were analyzed for various physical and chemical parameters like pH, water temperature, electrical conductivity (EC), total dissolved solids (TDS), Biological oxygen demand (BOD), chemical oxygen demand (COD) and dissolved oxygen (DO)."

118. Microbiological analysis was done by using Membrane filter technique. The results of various parameters determined strongly suggested that landfill leachate had severe deleterious impact on the water quality of Salhad stream. The parameters exceeding the allowable limits of WHO, EC and NEQS included pH, TDS, BOD, COD, total bacterial counts and total coliform counts. Heavy metals like Pb, Cd and Cu were released from the leachate into the Salhad stream, which might affect the sustainability of the aquatic life. Integrated, multi-sector approaches are required to deal with the contamination problem and sustainable management of the Salhad stream water."

4.1.7 Groundwater

119. The boring of water wells to obtain ground water is a standard practice by the residents of Abbottabad for supply of water, which has led to a reduction in the water table of Abbottabad city by over 200 feet over the past decade.

120. Geotechnical and topographical reports suggests that groundwater is not encountered in boreholes up to a depth of 20 m. Upon site observation, the first strata of subsoil water is found approximately 90 ft. (27 meters) and is around 200 ft. (60 meters) most of the year.

121. EPA certified lab. The results of the tests are presented as **Annexure D**, which indicates that all parameters of the ground water samples taken are within the applicable NEQS.

4.1.8 Noise

122. The receptor map showing the selected ambient noise monitoring locations are provided as **Figure 4-11** below with the comparison of the results also presented in **Table 4.4** below. While the results indicate the ambient noise levels being within the most stringent standards. Results of ambient Noise Monitoring from EPA approved laboratory have been attached as **Annexure D**. While the results indicate the ambient noise levels being within

⁹

https://www.researchgate.net/publication/263910231_Effect_of_Landfill_Leachate_on_the_Water_Quality_of_the_Salhad_Stream_in_Abbottabad_Pakistan

the most stringent guidelines during the daytime, however, exceedances were observed at the night time at all locations in the project area. This could possibly be due to the high volume of traffic on the Hazara motorway, resulting in high noise levels, particularly during the night time hours with traffic on this motorway running continuously.

4.1.9 Air Quality

123. The receptor map showing the selected ambient air quality monitoring locations are provided as **Figure 4.11** below with the comparison of the results presented as **Table 4.5** below. Results of 24 hourly Ambient Air Quality Monitoring from EPA approved laboratory have been attached as **Annexure D**. The wind rose for Abbottabad city (provided as **Figure 4.6**) shows that the predominant wind direction is West-South-West and South-West.
124. As can be observed, in general the air shed seems to be of reasonable quality with the ambient air quality mostly within the acceptable NEQS standards apart from SO_2 , which is exceeding the guidelines at three of the four monitored locations and PM_{10} exceeding the guidelines at all monitored locations. The increased SO_2 and PM_{10} emissions are due to the high volume of traffic on the motorway coupled with the burning of waste at the site.

Figure 4-11: Sampling Locations for Environmental Monitoring



Table 4.4: Ambient Noise Monitoring Results (Day and Night) in Project Area

Monitoring Location	Parameter	Noise Reading Results	Noise Guideline (Commercial Area)	Compliance Status for Commercial Areas
Day Time Readings (0600 to 2200)			Day time	
34° 7' 30.65"N 73° 11' 13.21"E	dB(A) Leq	59.6	65	
34° 7' 31.99"N 73° 11' 21.84"E		57.3		
34° 7' 25.9"N 73° 11' 19.62"E		60.4		
34° 7' 28.55"N 73° 11' 12.59"E		59.3		
Night Time Readings (2200 to 0600)			Night time	
34° 7' 30.65"N 73° 11' 13.21"E	dB(A) Leq	59.2	55	
34° 7' 31.99"N 73° 11' 21.84"E		56.4		
34° 7' 25.9"N 73° 11' 19.62"E		58.5		
34° 7' 28.55"N 73° 11' 12.59"E		58.1		

■ Exceedance from applicable guidelines

■ 'Within' applicable guidelines.

Table 4.5: Comparison of ambient air quality results versus applicable Air Quality standards

Monitoring Location	Parameter	NO (up/m ³)	NO ₂ (up/m ³)	CO (mg/m ³)	SO ₂ (up/m ³)	PM _{2.5} (up/m ³)	PM ₁₀ (up/m ³)
Applicable Guideline (up/m ³) for 24 hrs.	Average	-	80	05	20	25	50
34° 7' 30.65"N 73° 11' 13.21"E	-	14.33	20.09	0.69	23.18	23	83.72
34° 7' 31.99"N 73° 11' 21.84"E	-	15.10	21.51	0.72	24.11	24.1	83.05
34° 7' 25.9"N 73° 11' 19.62"E	-	14.81	16.82	0.69	21.08	23.58	84.28
34° 7' 28.55"N 73° 11' 12.59"E	-	13.74	16.24	0.73	19.46	23.65	77.21

■ Exceedance from applicable guidelines

■ 'Within' applicable guidelines

4.2 Ecological Environment

125. In order to identify ecological resources, ecological baseline survey was carried out by EDCM team. Detailed surveys were conducted for project scoping during July 2020. The site has been used for waste dumping since last many decades and thus, no sensitivities with regards to ecology exist in the project area.

4.2.1 Biological Environment

126. Three major habitat types have been identified in Abbottabad district:
- Subtropical broad-leaved zone, confined to sheltered ravines, which carries 40 species of trees, shrubs and woody climbers;
 - Subtropical chir pine zone, where chir is the dominant vegetation but a sprinkling of other associated plant species is also found; and
 - Moist temperate zone, covering 26% of the district, which is an important biotope for wildlife and supports coniferous forests with patches of broad-leaved species.

4.2.2 Protected areas/Critical Habitats

127. Two protected areas, the Ayubia National Park and the Qalandarabad game reserve, have been designated by KP wildlife department within Abbottabad district. However, both of these protected areas are located over 50 km away from the proposed park site.

4.2.3 Flora

128. There are some species such as trees, grasses and shrubs are found near the project area. Good quality fodder grasses are also found at the moist places, where the incidence of grazing is less. List of flora observed in project area are listed below in **Table 4.6**.

Table 4.6: List of Flora observed in Project Area¹⁰

Scientific Name		Common Name	IUCN Status
Tree	Acacia Modesta	Phulai	Data Deficient (DD)
	Acacia nilotica	Kikar	Least Concern (LC)
	Dodonaea Viscosa	Broad leaf hopbush	Least Concern (LC)
	Melia azedarach	Bakain	Least Concern (LC)
	Morus alba	Mulberry	Least Concern (LC)
	Lagerstroemia regina	Taman	Data Deficient (DD)
	Bambusa arundinacea	Bamboo	Data Deficient (DD)
	Zizyphus jujuba	Ber	Data Deficient (DD)
Shrub	Adhatoda Vesica	Bhaikar	Data Deficient (DD)

¹⁰ Data collected by EDCM ecology team during field survey

Scientific Name		Common Name	IUCN Status
	Ricinus Communis	Arind	Data Deficient (DD)
	Calotropis procera	Ak	Data Deficient (DD)
Herb	Chenopodium botrys	Bathu	Data Deficient (DD)
	Gymnosporia royleana	Pataki	Data Deficient (DD)
Grass	Cynodon dactylon	Khabbal	Data Deficient (DD)
	Cymbopogan jawarnica	Khawi	Data Deficient (DD)
	Desmostachya bipinnata	Dab	Least Concern (LC)
	Saccharum munja	Kana	Data Deficient (DD)
	Dicanthium annulatum	Murka	Data Deficient (DD)

4.2.4 Fauna

129. The project area, on account of nature of vegetation and topography, once rich in vegetation and wildlife has now reduced its potential due to over hunting, loss of proper habitat, conversion of forest land into bare land. Fauna of the tract consists of mammals, reptiles, amphibians and birds.

Mammals

130. Important mammal species found in the vicinity of the project area are mentioned below in the table with their respective IUCN status in the Red List.

Table 4.7: List of Mammals observed in Project Area¹¹

Scientific Name		Common Name	IUCN Status
Mammals	Vulpes	Red Fox	Least Concern (LC)
	Canis Aureus	Golden Jackal	Least Concern (LC)
	Hystrix Indica	Indian Crested Porcupine	Least Concern (LC)
	Sus Scrofa	Wild Boar	Least Concern (LC)
	Funambulus pennanti	Squirrel	Least Concern (LC)
	Mus musculus	Mouse	Least Concern (LC)

¹¹ Source: EDCM Ecology Survey, July 2020

Reptiles

131. Reptiles reported in the project area and its vicinity are given in **Table 4.8**. Other varieties of snakes reported in the project area are Rat Eaters, Sang Choor and a snake locally called as Phissi.

Table 4.8: List of Reptiles observed in Project Area

Sr.No.	Common Name	Scientific Name
1	Cobra	Najanaja
2	Indian Krait	Bungaruscaeruleus
3	Spiny Tailed Lizard	Uromastixhardwickii
4	Fringed Toed Lizard	Acanthodactylus cantoris
5	Brown Turtle	Kachugasmithii
6	Indian Monitor	Varanusbengalensis

Amphibians

132. Amphibians found in the project area are given in **Table 4.9**.

Table 4.9: List of Amphibians observed in Project Area

Sr.No.	Common Name	Scientific Name
1	Frog	Ranatigrina
2	Common Toad	Bufobufo

Birds

133. Avifauna of the project consists of small and medium sized birds of different colors, flying from one tree to the other or from crop to crop. Most common birds are House Sparrow, House Crow and Mynah. Birds like Cuckoo, Bulbul, Hoopoe, Parrots, Blue Birds, and Little Egrets etc. were frequently sighted. The **Table 4.10** shows list of birds listed noticed or reported in the project area.

Table 4.10: List of Birds observed in Project Area¹²

Sr.No.	Common Name	Scientific Name
1	House Sparrow	Passer domesticus
2	House Crow	Corvussplendens
3	Mynah	Acridotheresgiganteus
4	Parrot	Psittaculaekrameri
5	Pigeon	Columba livia

¹² EIA of Hasanabd – Havelian Section of E-35 Project.

Sr.No.	Common Name	Scientific Name
6	Koel	Eudynamyscolopacea
7	Red Vented Bulbul	Pycnonotuscafer
8	Common Teal	Anascrecca
9	Little Egret	Egrettagarzetta
10	Ruddy Shelduck	Tadornaferuginea
11	Mallard	Anus platyrhynchos
12	Hoopoe	Upupaepops
13	Indian Robin	Coraceusbengalensis
14	Grey Partridges	Francolinusponticerianus
15	Black Partridges	Francolinusfrancolinus
16	Falcon	Falco perginus
17	Shikra	Accipeterbadius
18	Tillor	Houbara bustard
19	Eagle	Aquillarapax
20	JalKookri	Fulicaatra
21	Fakhta	Streotopelladecaocto

4.2.5 Aquatic Life of the Project region

134. Dor River is flowing in the southern side of proposed park site. Major species of fish found in Dor River is Indian carps, such as Rah (*Labeorohita*), Thela (*Catlacatla*), Mori (*Cirrhinusmrigala*) and Singhari (*Aorichthysaor*). However population of fisheries is countinoualsy decreasing due to increased water pollution and reduce environmental flows¹³.

4.2.6 Endangered Species of the Project Region

135. An estimated 1,300 plant varieties are found in Abbottabad district. In addition, the area is home to 18 mammal species, seven of which are endangered: the common leopard, common red fox, Himalayan palm civet, jungle cat, Murree vole, musk deer and woolly flying squirrel. Project area has been used as a waste dumping ground and it is no longer habitat of such species, therefore, no impact of project activities on endangered species is envisaged.

4.2.7 Tree Cutting

136. Additional plantation of 1,064 trees and 1,052 shrubs and flowering plants will add in to the site to increase the green cover of the area. Any tree cutting necessary to develop the park infrastructure will be minimized as far as possible.

¹³ EIA of Hasanabd – Havelian Section of E-35 Project

4.3 Socio-economic Environment

137. This section includes a summary of the prevailing socio-economic conditions in the project area and the population that will be potentially affected by the project. To ascertain the socio economic condition of the project area, primary and secondary data was collected including social and physical infrastructure in the project area.

4.3.1 Administrative Setup

138. The project is located in Abbottabad city, situated in the south east of Khyber Pakhtunkhwa Province. The decentralization of lower-tier governance, a process set in motion following the promulgation of the NWFP Local Government Ordinance 2001, has created new administrative structures in the province. At the district level, a three-tier local government system has been put in place, consisting of the following levels:
- i. District government,
 - ii. Town municipal administration (TMA), and
 - iii. Union Council administration.

139. There are only two tehsils in the district Abbottabad i.e. Abbottabad tehsil and Havelian tehsil. District administration is headed by the Deputy Commissioner (DC), who is assisted by Assistant Commissioner (AC), Tehsil Mayor and district heads of departments. The main district departments include: administration, judiciary, police, education, health, communication and works, agriculture, forest, irrigation, telecommunication and livestock. The head of each district department is responsible for the performance of his department and is generally designated as the Deputy Director or District Officer.

4.3.2 Demography and Population

140. The population of Abbottabad district in 1998 was 881,000. The c'ty's annual growth rate is estimated at 3.99% per year, and the population of Abbottabad district is 1,332,912 according to the 2017 census, Abbottabad is the ⁴⁰th-largest city of Pakistan.

Districts	Headquarters	Area (km ²)	Population (2017)	Density (people/km ²)
Abbottabad	Abbottabad	1,967	1,332,912	680

*Source District wise population Census 2017 by Pakistan Bureau of Statistics: Government of Pakistan.

4.3.3 Religion

141. Almost whole population of the project area is Muslim. Cultural festivals are mostly linked with traditional religious events. Only 1% minorities were identified during field visit.

4.3.4 Archaeological and Cultural Site

142. No archaeological and cultural site was observed in close proximity of the proposed Salhad park site. However, if any archaeological antiquity is discovered, the Archeological Chance Find procedure shall be adopted, provided as **Annexure G**.

4.3.5 Ethnicity in the Project Area

143. During Social Due Diligence (SDD) for the proposed park development, it was found that the entire population is Muslims and they did not consider themselves to be called any other type of population such as indigenous peoples as the ADB's SPS 200. None of these castes may be considered as indigenous people (IP) based on ADB SPS definition.

4.3.6 Language and Dialects

144. The major language of the area is Hindko, which in the 1981 census was the mother tongue of 95% of households. The variety spoken in the city of Abbottabad has formed the basis of a literary language. It is very close to the Hindko varieties of Mansehra: the two share 86% of their basic vocabulary. In the project area of the district, the language is still known as Hindko but becomes more distinct and gradually transitions into the dialects of Pahari. Other languages are overall more common in urban areas: in the 1998 census, 2.3% of the population reported their language as Punjabi (rising to 10.8% in urban areas), while the share of Pashto was 2.2% (8.4% in urban areas) and that of Urdu – 1.1% (5.1% in urban areas).¹⁴

4.3.7 Dwellings

145. Housing conditions of the respondents have been analyzed according to the type of houses in which they were residing. The house or building constructed with concrete or burnt bricks fall in 'pacca' category whereas house or building constructed with burnt bricks with mud comes under semi-pacca category while house constructed with mud bricks or temporary wooden logs etc. are categorized as 'kacha' house. Project area most population is living in 'semi-pacca' and 'pacca' houses.

4.3.8 Economics of Abbottabad

146. Abbottabad is blessed with many natural resources. It is especially famous for the production of agricultural products, mining, tourism, industries of various products, and dependence on natural resources. All these produce play an important role in economic uplift of the people of Abbottabad¹⁵. Majority of the people of Abbottabad are directly or indirectly depends on agricultural, mining, tourism, Government/private jobs in educational/government institutions for their income.

4.3.9 Education Facilities in Project area

147. Abbottabad has a very encouraging literacy rate approximately 56% on an average. The city has a young demographic (ages 15–30) due to the large number of students who have come from across the country to study in its schools, for example PIPS, Army Burn Hall College, Army Public College Kakul and Abbottabad Public School.
148. Abbottabad city has also wide variety of post-secondary institutions, such as Ayub Medical College, Frontier Medical College, COMSATS University of Science and Technology, and the University of Engineering & Technology Abbottabad Campus.

4.3.10 Social Amenities in the project area

¹⁴ 1998 District census report of Abbottabad. Census publication. Islamabad: Population Census Organization, Statistics Division, Government of Pakistan. 1999

¹⁵ https://smeda.org/index.php?option=com_content&view=article&id=103:abbottabad&catid=47&Itemid=258

149. During the field survey, the access/ availability of the social amenities/ basic infrastructure was asked from the surveyed households as well as physically observed at site. It was noted that facilities such as Electricity, Sui Gas, Water Supply, Telephone, Sewerage Drainage, school are available in Abbottabad city.

4.3.11 Major Source of Drinking Water

150. Currently, there are two main source of water supply in Abbottabad. The major source is ground water source based on tube wells while the second source is the existing surface water-based water treatment plant (JICA). The approximate discharge of the existing and operational 14 tube wells is 1,120,000 gallons per day and average water supply from existing JICA water treatment plant 65pprox.rox. 1,460,766 gallons per day, which gives a total supply of 2,580,766 gallons per day. At present, there is net shortfall of 2,669,234 gallons per day in Abbottabad.

4.4 Findings of Social Due Diligence

151. The Consolidated Social Due Diligence Report (SDDR) has been prepared as a document of land acquisition and resettlement related impacts of the subprojects selected under the proposed Khyber Pakhtunkhwa Cities Improvement Project (KPCIP) to be financed by the Asian Development Bank (ADB). The SDDR has been prepared by the social safeguard team of the Project Management Unit (PMU), KPCIP under the Local Government Department (LG) Government of Khyber Pakhtunkhwa (KP) as the executing agency (EA) for the proposed KPCIP project.
152. As per ADB Safeguard Policy Statement (SPS-2009), the LAR impacts are considered significant if 200 or more persons experience significant impacts that are physically displaced from housing and lose 10% or more of their income-generating resources. As far as overall KPCIP is concerned, it is a stand-alone project and falls in the IR category B as no DPs will face physical dislocation from housing or lose 10% or more of their resources that are income-generating. Based on this IR and IPs screening and categorization, the proposed sub-project falls in category C.
153. The DDR team carefully reviewed the project documents and consultations with the project staffs and consultants for the presence of any IPs communities. It was found that the entire population is Muslims and they did not consider themselves to be called any other type of population such as indigenous peoples as the ADB's SPS 2009 describes the IPs to be. As the Project is not entailed any significant impact on indigenous peoples owing to the nonexistence of the IP, hence the IP (Indigenous peoples) category "C" will stand here as reflected in. Therefore, an Indigenous Peoples Development Plan (IPDP) is not required for this Project.

4.5 Sensitive Receptor Mapping

154. The proposed park location is shown in **Figure 1.1** above. As can be observed, there are a number of scattered clusters of settlements all around the proposed park site.

The photographs of the project site and its surroundings are provided as Pictures 1 to 4 below.



Picture 1. Recycling plant (back) and piles of waste



Picture 2. Fumes from dumpsite blow towards KKH



Picture 3. Destruction of natural landscape



Picture 4. Resilient plants growing on dumpsite

5 Analysis of Alternatives

5.1 Overview

155. Project alternatives are studied as a part of this IEE process. Alternatives analysis has been conducted in detail to foresee environmental, economic and social impact of each alternative. This chapter also provides an overview of the various commercially available technologies for the water treatment in an environmentally sound manner and are successfully running in developed countries in particular and recommend the most suitable set of options for Abbottabad city.
156. The development of the Salhad Park is based on detailed feasibility assessments focusing on assessing the city requirements with regards to population and demand for next thirty years and then determining the most suitable and effective technology and location for development of the required infrastructure.
157. This process of analysis of the different alternatives for development of the Salhad Park will ensure that a well-informed decision is taken regarding the selection of the most optimal option amongst the possible options that are brought into consideration.

5.2 No project Option

158. The development of this park on the existing dumpsite will turn a pollution source into a orchard and scenic stopping point for travellers. Its dense plantation, sitting spaces, café and parking space for over 70 vehicles will attract both tourists and locals to the site. The direct beneficiaries of this project will be the 1,684,233 residents of Abbottabad and Havelian and travelers of the KKH. The 36,018 residents of peri-urban Union Council Salad will also witness positive impacts from reduction in the contamination of underlying aquifers and production of noxious fumes from open air garbage incineration. Fruit from the park's orchards will be available to the public free-of-cost. Tree plantation will also help reduce the urban heat island effect, purify the air and absorb greenhouse gases.
159. If 'no project' option is triggered, it will result in loss of all the positive impacts mentioned above. The project will also greatly improve the aesthetics of the area while improving public health by removing disease vector generation and odor in the area. This park will also result in the economic uplift of the area with job opportunities being created and businesses being developed around the park activities. Thus, the 'no project' option is not a viable option.

5.3 Site Selection

160. The main rationale for selecting this site is to convert it from a dumping ground into a park and thus no other site was under consideration since only this site can be used for this dual purpose of remediating an existing dump site and then converting it into a recreational activity.
161. It should also be mentioned that this site is located on government land and thus no land acquisition or resettlement will be required, which is a major advantage of this site. Furthermore, the communities around the site are largely in favor of development of this park since it will have a large number of benefits for them.

5.4 Site Remediation options

162. Based on the detailed design, the most suitable strategy for site remediation was selected, consisting of cleaning up the site and moving the waste to another location, with the possibility of first converting it into an environmentally benign form, such as compost at site and then applying it to agricultural lands etc. In addition, the installation of a network of piping and drains to manage and treat any leachate and landfill gas that may be produced in the long term from the waste already dumped over the past many decades at the site was considered the most suitable approach.

6 Potential Environmental Impacts and Mitigation Measures

163. Potential impacts arising from design, construction and operation phase of Salhad Park have been identified and assessed on the basis of field data, secondary data, expert opinion and examining previous similar projects in Pakistan. These include effects on physical, biological and socio-economic environments. Impacts associated with design, construction and operation phases of project components have been detailed in the section.
164. The impact assessment of proposed park development has been conducted in accordance with the requirements of KP EPA, 2014, Pak EPA-1997 and ADB SPS, 2009. According to ADB's Safeguard Policy Statement (SPS) 2009, an REA Checklist was prepared for the proposed park development to determine the scope of the IEE.
165. Impact-screening matrices during development phases i.e. project design, construction and operation are presented below.

6.1 Methodology for impact screening

166. The methodology for assessing the risk level associated with each potential impact is presented below.
167. Risk is assessed as the likelihood that the activity will have an effect on the environment as well as the consequence of the effect occurring. It is often described like this:

$$\text{Risk} = \text{Likelihood} \times \text{Consequence}$$

Likelihood Scale

Likelihood	Definition	Scale
Certain	Will certainly occur during the activity at a frequency greater than every week if preventative measures are not applied	5
Likely	Will occur more than once or twice during the activity but less than weekly if preventive measures are not applied	3
Unlikely	May occur once or twice during the activity if preventive measures are not applied	2
Rare	Unlikely to occur during the project	1

Consequence Scale

Consequence	Definition	Score
Catastrophic	The action will cause unprecedented damage or impacts on the environment or surrounding communities	5
Major	The action will cause major adverse damage on the environment or surrounding communities	3
Moderate	No or minimal adverse environmental or social impacts	2
Minor	No or minimal adverse environmental or social impacts	1

Risk Score Table

Likelihood	Consequence				
		Catastrophic	Major	Moderate	Minor
Certain	25	15	10	5	
Likely	15	9	6	3	
Unlikely	10	6	4	2	
Rare	5	3	2	1	

Risk: Significant: 15-25

Medium: 6-10

Low 1-5

168. Any 'Medium' to 'Significant' risk requires an environmental management measure to manage the potential environmental risk. Judgment will be required concerning the application of an environmental management measure to mitigate low risk situations.

6.2 Design/Pre-Construction Phase

Impact Screening Matrix

169. The 'activity wise' screening of potential impacts during the design/pre-construction phase is provided in **Table 6.1** below.

Table 6.1: 'Activity Wise' screening of possible Impacts during Design/Pre-Construction phase

S/No.	Potential Issue	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Unsuitable locations for disposal of solid waste dumped on site as part of site remediation	Likely	Moderate	Medium	Short Term
2	Insufficient site investigations leading to incomplete site remediation	Likely	Moderate	Medium	Short Term
3	Inadequate designing of leachate and landfill gas piping systems leading to risks to settlements in project area	Likely	Moderate	Medium	Short Term
4	Lack of integration of IEE/EMP requirements into Construction bid documents	Likely	Moderate	Medium	Short Term
5	Improper Material Haul Routes	Likely	Moderate	Medium	Short Term
6	Limited Contractor's Environmental Safeguards Capacity	Likely	Moderate	Medium	Short Term
7	Improper locations for Labor Camps and ancillary facilities	Likely	Moderate	Medium	Short Term
8	Cultural Heritage & Religious Sites, Social Infrastructure	Unlikely	Moderate	Low	No residual Impact
9	Land acquisition and resettlement impacts	Likely	Moderate	Medium	Long Term
10	Impacts due to natural hazards	Unlikely	Moderate	Low	No residual Impact
11	Impacts due to existing utilities	Likely	Moderate	Low	No residual Impact

Critical Risk Level

Significant Risk Level

Medium Risk Level

Low Risk Level

6.2.1 Unsuitable locations for disposal of solid waste dumped on site as part of site remediation

Impacts

170. As part of the site remediation before any works on development of the Salhad park can commence, suitable location(s) for disposal of the waste already dumped on the site must be identified. Furthermore, although in the long term, the waste will be dumped at the landfill site to be developed at Dhamtor under KPCIP, however, until this SWMF becomes available for waste disposal, a suitable alternative location must be identified.

Mitigation measures

171. The WSSC Abbottabad must ensure, at the earliest, the identification of a suitable location for disposal of the solid waste already dumped at the proposed park site as part of the site remediation. The identification of this dumping location must be based on a detailed and comprehensive environmental and social safeguards assessment.
172. This alternative site identified will used for solid waste dumping until the SWMF at Dhamtor becomes operational.

6.2.2 Insufficient site investigations leading to incomplete site remediation

Impacts

173. The possibility exists that the required site investigations are not conducted to the necessary level of detail, possibly due to not engaging the necessary level of expertise and resources, which could lead to partial/incomplete site remediation. As a result, significant long term and irreversible impacts could take place.

Mitigation measures

- A detailed and comprehensive plan must be developed for the site investigations, consisting of allocation of necessary resources and technical expertise to ensure all aspects of the site from a technical and safeguards viewpoint are assessed.
- Based on these detailed site investigations, a comprehensive and robust site remediation plan must be developed for implementation by the Contractor.

6.2.3 Inadequate designing of leachate and landfill gas piping systems leading to risks to settlements in project area

Impacts

174. As part of the designing process, it is possible that the leachate and landfill gas piping systems are not designed properly, leading to significant long term impacts that may be irreversible and may cause considerable damage both to the health and safety of the receptors in the project area due to leachate and landfill gas leaks.

Mitigation measures

175. It shall be ensured that all detailed designs are vetted by third party experts to ensure the designs are robust and all possible leachate and landfill gas leakage scenarios have been assessed to ensure no long term impacts from an environmental safeguards standpoint take place.

6.2.4 Lack of integration of IEE/EMP requirements into Construction bid documents**Impacts**

176. The bidding documents must reflect the requirement to select a qualified and experienced Contractor from the perspective of ensuring implementation of required safeguards during project development.

Mitigation measures

177. The proposed 'Safeguards unit' that will be developed at the PMU will be assigned the task to check that design and bid documents are responsive to key environmental, social and safety considerations, and that the proposed method of work reflects the boundaries defined in the EMP. The bid documents must include the EMP and its implementation cost must be reflected in the BOQ.
178. IEE/EMP implementation and monitoring requirements must be part of bidding documents and necessary contractual binding must be agreed by project contractors before award of contract.
179. Project contractors shall have qualified and experienced environmental staff to plan, arrange, implement, monitor and report IEE/EMP requirements.

6.2.5 Improper Material Haul Routes**Impacts**

180. Hauling of material can have significant impacts on the community, public safety, traffic congestion, air quality and lifespan of the Abbottabad city road ways.

Mitigation measures

181. The construction vehicles hauling materials along the Abbottabad city roads and anywhere where there are sensitive receptors such as hospitals, schools and/or roadside residences will be limited and the PMU in collaboration with the focal agencies will establish a route plan to minimize this disruption, which shall be appended to the EMP.

6.2.6 Limited Contractor's Environmental Safeguards Capacity**Impacts**

182. Lack of contractor's environmental safeguard capacity or selection of environment non-responsive contractors may result in failure of EMP implementation and may be a source of number of non-compliances.

- 183. The responsibility of the PMU KPCIP in collaboration with the focal agencies is to review and finalize the bidding documents relating to environmental issues.
- 184. Contractors that do not possess the required capacity for safeguards management must not be pre-qualified and selected.

Mitigation measures

- 185. PMU KPCIP shall review the Contractor capacity with respect to safeguard management and contracts shall be awarded accordingly.
- 186. The Contractor will be required to define an Occupational and Environmental Health and Safety procedure for all work, including work camp operation, management of cement dust, and use of Personal Safety Equipment. These procedures will be developed and approved by the PMU in collaboration with the focal agencies before the Contractor commences any physical works on ground.
- 187. PMU KPCIP shall ensure the project Contractors are selected on merit and necessary funds has been allocated in the contract documents for EMP implementation and monitoring.

6.2.7 Improper locations for Labor Camps and ancillary facilities

Impacts

- 188. The duration of the construction activity for the proposed park development is expected to be 24 months and a considerable amount of work force will be engaged. As a result, worker camps will need to be developed and ancillary facilities will need to be provided such as electricity, washrooms for labor with suitable effluent and sewage disposal facilities as well as water for their everyday use for drinking and bathing etc.

Mitigation measures

- 189. In order to prevent a nuisance, specific locations shall be designated for development of the labor camps. All necessary facilities and amenities shall be provided in these camps such as resting area, drinking water, electricity, supply of water.
- 190. Solid and liquid effluent waste disposal facilities shall also be designed to cater waste of administration/office building etc.
- 191. The use of proper planning while identifying locations for the labor camps will ensure there is minimal disturbance to all key receptors and the traffic is not disrupted by labor camps being set up roadside next to the construction sites.

6.2.8 Cultural Heritage & Religious Sites

Impacts

- 192. No sites of any cultural or religious significance are located within the proposed project area and thus no impacts in this regard are expected.

Mitigation Measures

No mitigation measures are required.

6.2.9 Land Acquisition and Resettlement Impacts

Impacts

193. The proposed project site is located on government owned land and thus no land acquisition and/or resettlement impacts are expected.

Mitigation Measures

No mitigation measures are required.

6.2.10 Impacts due to Natural hazards

Impacts

194. Site is located outside of seismically active area as it falls in Zone 3. No fault lines or significantly fractured geologic structure is present that may allow unpredictable settlement/land sliding.
195. The proposed site is located outside the flood plain, however, in case of high precipitation, there are chances of flash flooding from the Salhad Nullah.
196. High speed winds due to mini-cyclones and wind storms can result in damage to the park infrastructure.

Mitigation Measures

- The PMU KPCIP shall ensure the proposed park infrastructure shall be designed keeping in view the seismic zone 3 building considerations.
- Surface water diversion shall be included in the design to protect the park infrastructure from potential flash flooding of Salhad Nullah.
- Extreme precipitation events analysis shall be performed for i.e. 100 years, to predict and manage impacts of flash flooding on the park infrastructure.
- On site waste storage shall be kept to minimum during high precipitation events.
- Infrastructure built by the project will be designed to withstand high speed winds.
- Water permeable surfaces such as pavers/paving stones will be used in the parking lot, walking track, restroom and administration building area to reduce flooding (and possibly recharge the groundwater).
- Emergency response plan shall be prepared by construction and operation phase Contractors and will be submitted to PMU for approval to manage impacts of natural hazards such as earth quakes and floods.

6.2.11 Impacts due to existing facilities

Impacts

197. The proposed works for the park development may result in an impact such as damage to the existing utilities (water pipelines, power lines, gas pipelines, telephone lines etc.) present near the project site and in the project area.

Mitigation measures

198. The following measures will be implemented:

- The PMU KPCIP shall ensure the proposed infrastructure shall be designed keeping in view the minimum disturbance to existing utilities.
- CSC will ensure that project contractors will perform condition assessments prior to any excavation works and will inform CSC/WSSC Abbottabad about the presence of any existing utilities at the project site.
- In case if there is need of shifting of any utility, utility custodian department will be taken on board by WSSC Abbottabad for necessary approvals and information.
- PMU KPCIP/WSSC Abbottabad will pay compensation to damage of utilities to utility owners and will ensure that there will be no grievances in this regard.

6.3 Construction Phase

Impact Screening Matrix

199. The screening of potential impacts during the construction phase is provided in **Table 6.2** below.

Table 6.2: Screening of Possible Impacts during Construction Phase

S/No.	Potential Issue	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Degradation of air quality due to construction works	Likely	Moderate	Medium	Short term
2	High noise levels from construction activities	Likely	Moderate	Medium	Short term
3	Impacts on surface water quality of Salhad Nullah	Likely	Moderate	Medium	Short term
4	Potential accidents and injuries to communities in project area	Likely	Moderate	Medium	Short term
5	Injuries to workers from lack of necessary training and/or not using PPEs etc.	Likely	Moderate	Medium	Short term

S/No.	Potential Issue	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
6	Improper handling and/or disposal of hazardous and non-hazardous waste	Likely	Moderate	Medium	Short term
7	Untreated disposal of effluent from worker camps and batching plant(s)	Likely	Moderate	Medium	Short term
8	Soil Contamination	Likely	Moderate	Medium	Short term
9	Employment Conflicts	Likely	Moderate	Medium	Short term
10	Communicable diseases incl. COVID-19	Likely	Moderate	Medium	Short term
11	Construction of Administration Building and Other Infrastructure	Likely	Moderate	Medium	Short term
12	Site Restoration	Likely	Moderate	Medium	Short term
13	Vegetation and Wildlife Loss	Unlikely	Moderate	Low	No residual Impact
14	Historical/Archaeological Sites	Unlikely	Moderate	Low	No residual Impact

 Critical Risk Level
 Significant Risk Level
 Medium Risk Level
 Low Risk Level

6.3.1 Degradation of Ambient Air Quality

Impacts

200. The proposed park development will involve large scale earth works and transporting and dumping large quantities of dry material. This will likely lead to an increase in SPM (Suspended Particulate Matter) in and around the construction zones. There are a large scatter of settlements around the project site at close proximity that may get affected by the increased levels of SPM.
201. Potential sources of particulate matter emission during construction activities include earthworks (dirt or debris pushing and grading), exposed surfaces, exposed storage piles, truck dumping, hauling, vehicle movement on unpaved roads, combustion of liquid fuel in equipment and vehicles, land excavation, and concrete mixing and batching.
202. Vehicles carrying construction material are expected to result in increased SPM levels near the haul roads. This can be of potential importance if the vehicles pass through the areas with a high concentration of sensitive receptors, such as residential areas, in this particular case.

203. At the construction yard, the dust levels are also expected to increase due to unloading of construction materials. It shall be ensured that most of the excavated material will be used within the project, with minimal cut and fill material to come from outside the site.
204. Poor air quality due to the release of contaminants into the workplace can result in possible respiratory irritation, discomfort, or illness to workers. Employers shall take appropriate measures to maintain air quality in the work area.
205. The quantity of dust that will be generated on a particular day will depend on the magnitude and nature of activity and the atmospheric conditions prevailing on the day. Due to the uncertainty in values of these parameters, it is not possible to calculate the quantity from a 'bottom-up' approach, that is, from adding PM₁₀ emissions from every activity on the construction site separately. Typical and worst-case PM₁₀ emissions from construction sites have been estimated¹⁶ as 0.27 mega gram per hectare per month of activity (Mg/ha-month) and 1.04 Mg/ha-month, respectively.

Mitigation Measures

206. The following mitigation measures will be adopted for preservation of the environment:
 - At the project site and the immediately adjoining areas, water will be sprinkled every three hours and at a higher frequency if felt necessary, at all construction sites to suppress dust emissions.
 - All heavy equipment and machinery shall be fitted in full compliance with the national and local regulations.
 - Stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions.
 - Fuel-efficient and well-maintained haulage trucks shall be employed to minimize exhaust emissions.
 - Vehicles transporting soil, sand and other construction materials shall be covered with tarpaulin.
 - Limitations to speeds of such vehicles as felt necessary. Transport through densely populated areas shall be avoided.
 - Concrete plants to be controlled in line with statutory requirements and shall not be close to sensitive receptors.
 - Stack height of generators will be at least 3 meters above the ground.
 - Project traffic will maintain maximum speed limit of 20 km/hr. on all unsealed roads within project area.
 - A minimum distance of 300 meters will be ensured between batching plant(s) and the

¹⁶ Gaffney, G. and Shimp, D. 1997. *Improving PM₁₀ Fugitive Dust Emission Inventories*. Sacramento, CA. California Air Resource Board. <www.arb.ca.gov/emisinv/pubs/pm10tmp.pdf>

nearest community.

- The need for large stockpiles shall be minimized by careful planning of the supply of materials from controlled sources. Stockpiles shall not be located within 50 m of schools, hospitals or other public amenities and shall be covered with tarpaulin when not in use and at the end of the working day to enclose dust. If large stockpiles (>25m³) of crushed materials are necessary, they shall be enclosed with side barriers and also covered, when not in use.
- Dust emissions due to road travel shall be minimized through good construction practices (such as keeping stock piles down wind and away from communities) and sprinkling water over the access road(s).
- Maintaining levels of contaminant dusts, vapors and gases in the work environment at concentrations below those recommended as TWA-TLV's (threshold limit value)—concentrations to which most workers can be exposed repeatedly (8 hours/day, 40 hrs./week, week-after week), without sustaining adverse health effects.
- Developing and implementing work practices to minimize release of contaminants into the work environment, including:
 - Direct piping of liquid and gaseous materials
 - Minimized handling of dry powdered materials; Enclosed operations
 - Local exhaust ventilation at emission/release points
 - Vacuum transfer of dry material rather than mechanical or pneumatic conveyance
 - Indoor secure storage, and sealed containers, rather than loose storage

Fugitive Dust Control

207. The source wise fugitive control measures are provided in **Table 6.3** below. The Dust Management Plan has been attached as **Annexure H**.

Table 6.3: Control measures for Fugitive Dust emissions

Source	Control Measures
Earth Moving	For any earth moving that is to take place in the immediate vicinity from the site boundary, watering must be conducted as required to prevent visible dust emissions
Disturbed Surface Areas	Apply dust suppression measures (clear vegetation only from areas where work is to commence, plant or mulch areas that will not receive traffic, construct artificial wind breaks or wind screens) frequently to maintain a stabilized surface. Areas that cannot be stabilized, such as wind driven dust, must have an application of water at least twice a day

Source	Control Measures
Inactive Disturbed Surface Areas	Apply dust suppressants (clear vegetation only from areas where work is to commence, plant or mulch areas that will not receive traffic, construct artificial wind breaks or wind screens) in sufficient quantity and frequency to maintain a stabilized surface
Unpaved Roads	Periodic sprinkling on all roads used for any vehicular traffic at least twice per day during active operations and restrict vehicle speed to 20 km/h.
Open Storage Piles	Apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust or install an enclosure all along the storage piles Tarpaulin sheet shall be provided on the storage piles to avoid dust emissions.
Track-out Control	Wash down of construction vehicles (particularly tires) prior to departure from site.

Vehicular & Equipment Emissions

208. It shall be ensured that the following measures are taken to control emissions from vehicles being used in the construction activity:

- Periodically check and conduct maintenance of the construction machinery and haul vehicles. Generators, compressors and vehicles used during construction works will be maintained in a good condition to ensure that emissions are kept to a minimum level.
- Regularly change the engine oil and use new engines/machinery/equipment having good efficiency and fuel burning characteristics.
- Controlled technology generator and batching plants will be used to avoid excessive emissions.
- Burning of wastes at any site will not be allowed.
- The stack height of generators will be at least 3 meters above the ground.
- Training of the technicians and operators of the construction machinery and drivers of the vehicles.
- All type of machinery and generator must comply with the NEQS. Vehicles, which are not in compliance with NEQS are not allowed to be used.
- Periodic emission monitoring of vehicles, generator and batching plants is proposed.
- Project activities shall be planned to avoid harsh weather conditions.
- Idling of vehicles will be limited to 3-5 minutes.

6.3.2 High Noise Levels

Impacts

209. The proposed park development will result in different construction equipment and machinery i.e. jack hammer, cutter, excavator and haul trucks etc. being used which will generate high noise levels at the project site and in the project area.
210. The detailed mapping of sensitive receptors has been conducted and the types of receptors have already been mentioned earlier. However, any required mitigation measures that shall be proposed will be to control potential impacts on noise to prevent any long-term impacts within the project area.
211. The assessment of the noise impacts on the sensitive receptors that have been identified at various locations in the project area depends upon:
 - Characteristics of noise source (instantaneous, intermittent or continuous in nature)
 - Time of day at which noise occurs, and
 - Location of noise source
212. Each construction activity has its unique noise characteristics due to use of different equipment items. The potential sources of noise during the preparation, construction, and worksite closure phases for the proposed park development works include equipment, machinery, and transportation used for the construction activities. The equipment used for construction will be the major source of noise.
213. Since various modern machines are acoustically designed to generate low noise levels, any high noise levels that might be generated will only be for a short duration during the construction phase.
214. Depending on the construction equipment used and its distance from the receptors, the community and the workers may typically be exposed to intermittent and variable noise levels. During the day, such noise results in general annoyance and can interfere with sleep during the night. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as a doubling or halving of sound level.
215. Due to the various construction activities, there will be temporary noise impacts in the immediate vicinity of the project site. The movement of heavy vehicles, loading, transportation and unloading of construction materials produces significant noise during the construction stage. However, these increased noise levels will prevail only for a short duration during the construction phase.
216. The **Table 6.4** below represents typical noise levels from various construction equipment items. It should be noted that the values indicated in the table may differ depending on the brand and age of machinery provided/used by construction contractors.

Table 6.4: Construction Equipment Noise Ranges, dB (A)

Equipment	Peak Noise Range at 15 m	Typical Peak Sound Level in a Work Cycle at 15 m	Typical 'Quieted Equipment' Sound Level at 15 m	Construction Phase		
				Earthworks	Structures	Installation
Batching plant	82-86	84	81		Y	
Concrete mixers	76-92	85	82		Y	
Cranes	70-94	83	80		Y	Y
Excavators	74-92	85	82	Y		
Front loader	77-94	85	82	Y	Y	Y
Water bowlers	85-93	88	85	Y	Y	Y
Graders	72-92	85	82	Y		
Bulldozers	65-95	85	80	Y		
Pavers	87-89	88	80	Y		
Pumps	68-72	76	75	Y	Y	Y
Diesel generators	72-82	81	77		Y	Y
Drilling machines (Jack Hammer/potable jack hammer)	82-98	90	87	Y	Y	
Compressors	74-88	81	71		Y	
Dumpers	77-96	88	83	Y	Y	
Dump/flatbed Truck	75-85	80	77	Y	Y	Y

Sources: USEPA, 1971; <http://www.waterrights.ca.gov/EIRD/text/Ch11-Noise.pdf>;
http://www.lacs.org/LWRP%202020%20Facilities%20Plan%20DEIR/4_6_Noise.pdf;
<http://newyorkbiz.com/DSEIS/CH18Construction.pdf>

Notes:

- a. Where typical value is not cited in literature, mean of the peak noise range is assumed
- b. Quieted equipment can be designed with enclosures, mufflers, or other noise-reducing features. Where data is not available, a 3 dB reduction is assumed

217. Precise information on the type, quantity and location of equipment to be used during the construction phase is not available at this stage and will be dependent on the working methods of the selected contractors. However, preliminary calculations have been conducted to provide a general magnitude of the noise levels during various construction phases.
218. Maximum noise shall be generated while using mechanical/potable Jack hammer for cutting hard surfaces but this activity is limited as proposed only for cutting hard surfaces.i.e. concrete, however, excavators shall also be utilized for trenching at the proposed site, as required.
219. The mitigation measures listed below shall be implemented to minimize noise levels during the construction activity as far as possible.

Mitigation Measures

220. The following mitigation measures will be implemented:
 - Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment. Noise from vehicles and power generators will be minimized by use of proper silencers and mufflers.
 - Excessive noise emitting equipment will not be allowed to operate and will be replaced.
 - Blowing of horns will be prohibited on access roads to work sites.
 - Manual excavation has been proposed for congested areas to reduce generation of noise.
 - Limited use of jack hammer in populated work areas of the site.
 - As a rule, the operation of heavy equipment shall be conducted in daylight hours.
 - Construction equipment, which generates excessive noise, shall be enclosed or fitted with effective silencing apparatus to minimize noise.
 - Well-maintained haulage trucks will be used with speed controls.
 - Use of ear plug and ear muffs must be ensured during construction. No employee shall be exposed to a noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear shall be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
 - Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls shall be investigated and implemented, where feasible.
 - Periodic medical hearing checks shall be performed on workers exposed to high noise levels.
 - Grievance redress mechanism (GRM) will be established.

- All the equipment and machinery used during construction phase will be well maintained and in compliance with NEQS.

6.3.3 Impacts on surface water quality of Salhad Nullah

Impacts

221. Construction activity for the park development will be carried in close proximity to the existing Salhad Nullah which passes through the western part of the proposed site. Unattended stockpiling of excavated materials may interfere with drainage paths if not disposed off properly.
222. Poor solid waste management at the construction sites and waste dumping into the nullah by Contractor staff may result in surface water quality degradation. The drainage of the nullah must not be impeded by the works. The scale of the works does not warrant hydrological monitoring and any surface water quality depletion.
223. Soil erosion triggered by exposed soils on slopes is unlikely to occur; therefore, no significant impact on surface water quality due to soil erosion is expected.
224. If labor camps are situated close to the nullah, sanitary waste may cause surface water pollution. But the scattered nature of construction and short time may not require large scale labor camps. Construction works during rainy season, particularly during the monsoon season shall be avoided since it can trigger slip, fall hazards, solid waste management problems, poor quality construction works and interruptions in material supply.

Mitigation Measures

- PMU KPCIP will ensure that construction works are planned with a view that monsoon and winter rainfall season is avoided.
- The Construction Supervision Consultant (CSC) will expedite the construction works as much as possible to complete the tasks within minimum time duration.
- Construction debris will not be disposed off in Salhad nullah.
- No stockpiling of materials will be carried out near the nullah.
- No labor camp will be constructed at the nullah and no solid waste will be disposed off into it.
- The CSC will maintain good housekeeping during construction works.
- No slopes/excavations near the nullah will be left unattended.
- After construction works near the nullah, all construction material left will be picked up and the site restored to its original condition following best practices.

6.3.4 Potential Accidents and injuries to communities in project area

Accessibility

Impacts

225. The park development works will involve the use of considerable machinery along with posing the risk of community members. In addition, the risk to commuters on the road during the construction works will be significant and thus a number of precautionary measures will be necessary to minimize the risk of possible accidents. Community Health & Safety may be compromised during road travel particularly in night hours if adequate barriers and lighting is not provided at the construction sites.
226. Moreover, traffic congestion is also envisaged due to construction activity around the project site. Traffic diversion may result in congestion, pollution, and a high rate of accidents during peak hours.
227. Traffic Management Plan has been attached as **Annexure J**.

Mitigation Measures

228. The following mitigation measures will be implemented:
 - A comprehensive traffic management plan (TMP) must be developed and implemented;
 - As part of the TMP, it will be ensured that the movement of heavy vehicles used is minimized during the peak traffic hours of the day in order to prevent congestion and accidents as far as possible;
 - Furthermore, the movement of heavy vehicles within Abbottabad city while traveling to and from the project site must be restricted to specific routes containing least number of sensitive receptors and low traffic volumes.
 - Material stock piling and parking of machinery along the roads will be avoided. Contractors will identify suitable places for material stock piling and parking of machinery.
 - Work areas outside the project site, especially where machinery is involved, will be barricaded and will be constantly monitored to ensure that local residents, particularly children stay away from any excavated areas, which must be cordoned off. Also, no machinery will be left unattended, particularly in running condition.
 - Local communities in the project area will be briefed on traffic safety, especially women who are the main care providers to children.
 - Speed limit of 20 km/hr. will be maintained by all project related vehicles and nighttime driving of project vehicles will be limited where possible.
 - Educate drivers on safe driving practices to minimize accidents and to prevent spill of hazardous substances and other construction materials during transport.

- Contractor must take proper safety measures (placing warning tapes around excavations) to avoid people, especially children, accidentally falling into excavations.
- All the working platforms must be cordon off with special care by well-trained skilled workers.
- Contractor will prepare construction management plan which will include the hazard prevention and safety plan, which will address health and safety of the people in the project area.
- PMU KPCIP shall ensure the contractor staff working in the project are well trained and educated in the Health, Safety and Environment (HSE) hazards associated with their duties, and that of the public, in the project area.

6.3.5 Occupational Health and Safety (OHS)

Impacts

229. There is invariably an OHS risk when construction works for the park development are conducted, and precautions will be needed to ensure the safety of the workers. Occupational Health and Safety Plan has been attached as **Annexure E**.
230. The major OHS hazards expected during the proposed activities are as follows:¹⁷

Accident Hazards

- Falls from height, especially when standing/working on ladders;
- Slips, trips and falls, especially while carrying heavy or bulky loads;
- Cuts and injuries caused by sharp instruments and tools;
- Hazard of suffocation from asphyxiant gases released or from oxygen deficiency, during maintenance and cleaning operations;
- Burns caused by hot parts of equipment, steam lines etc., by release of hot water or steam;
- Electric traumas, caused by defective installations and equipment, especially portable;
- Musculoskeletal injury (especially of back), resulting from lifting and moving of heavy loads;

Physical Hazards

- Exposure to cold and/or heat stress, as a result of rapid movement between cold and hot areas;
- Exposure to UV radiation during welding operations;

¹⁷ https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_192256.pdf

Chemical Hazards

- Exposure to various chemicals, such as: adhesives, caulking compounds, fluxes (solder), hydrochloric acid, zinc chloride, tar and solvents, various greases and inorganic lead;

Biological Hazards

- Exposure to parasites, such as hookworm, ascaris, and various mites, chiggers and ticks;

Ergonomic, psychosocial and organizational factors

- Psychological stress due to dissatisfaction at work due to issues with peers, superiors etc.;
- General ill feeling as a result of work in confined spaces and development of 'sick building syndrome';

Mitigation Measures

General

231. The Contractor will be required to prepare and implement an effective OHS Plan that is supported by trained OHS personnel and emergency response facilities. Construction contracts will include standard OHS measures and Contractors will be bound to implement these fully.
232. Monitoring will be required to ensure that the health and safety plan based on contract specifications is followed.
 - Cement feed hopper areas will be inspected daily to ensure compliance with the requirement of dust masks.
 - Surfaces (including flooring and work surfaces) in camps, kitchens, dining areas and workshops shall be solid and easy to clean. Flooring for work camps must be float finished concrete or better.
 - All drivers engaged by Contractors must hold a valid license for the vehicle they are operating.
 - Work in confined space shall be executed with available safety standards. Adequate monitoring and equipment shall be available to detect deficient oxygen levels.
 - The Contractor shall submit to the Engineer of CSC for approval an emergency evacuation plan and practice the procedure annually.
 - The Contractor shall submit to the Engineer of CSC for approval a site layout plan, identifying work areas, accommodation, kitchen, dining area, sanitary facilities, location of generators, plant and vehicle parking, transport routes through the camp, pedestrian routes through the camp, evacuation routes, emergency exits, batching plants, storage areas, waste facilities etc.

- Fire extinguishers shall be provided throughout camps and work sites. Fire extinguishers shall be inspected monthly and maintained as necessary.
 - An adequate and reliable supply of safe drinking water shall be made available at readily accessible and suitable places including at all camps.
 - The Contractor shall take samples from each supply of drinking water and arrange for analysis of these samples at EPA certified laboratory prior to its use by the Contractor's staff. The results of these tests for each supply must be submitted to the Engineer of CSC and must demonstrate that each water supply meets national and World Health Organisation standards for drinking water.
 - The Contractor shall provide and maintain adequate hygienic kitchens which are sheltered and separated from the living quarters. Kitchens shall include raised and washable surfaces suitable for food preparation.
 - The Contractor shall provide and maintain adequate hygienic dining areas for staff. Work places and camps shall be provided with both natural & artificial light. Artificial lighting shall be powered by generator in the event of power cuts.
 - Public sensitization training will be provided to workers to avoid social conflicts between residents and the construction contractor, Occurrence of any such impacts can be avoided by community sensitive project planning and implementation and through effective involvement of local administration.
 - All OHS protocols will be implemented in true letter and spirit.
 - Contractor must appoint an OHS resource to implement, monitor and report the HSE management plan to concerned authorities.
 - Contractor must ensure the provision of first aid facility at construction site and camps through hiring medics and establishing a dispensary at the campsite.
 - Reasonable number of first aid kits will be available on construction sites and within contractor camps.
 - Site personnel will be provided appropriate type of personal protective equipment (PPEs). Contractor will ensure consistent use of PPEs.
233. Based on the type of hazard applicable during the proposed works at site, the following mitigation measures as per IFC guidelines for Occupational Health and Safety (OH&S) must be implemented:¹⁸

¹⁸ <https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6b-cb79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=ls62x8l>

Mitigation Measures for Physical Hazards

Rotating and Moving Equipment

234. Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Mitigation measures related to rotating and moving equipment on workers are provided below:
- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions.
 - Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment shall be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards shall be designed and installed in conformance with appropriate machine safety standards.
 - Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance.
 - Designing and installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms.

Vibration

235. Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, shall be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. Limits for vibration and action values. Exposure levels shall be checked on the basis of daily exposure time and data provided by equipment manufacturers.
236. Other sources of vibration at construction site are rollers, compactors or any loose part of machinery exposure which may cause serious injury or workplace sickness. No equipment and machinery with loose or vibratory parts will be allowed to work. Such issues will be fixed through maintenance of the machinery on periodic basis. Use of rollers for land grading will be carried out during day times and with intermittent intervals to reduce the impacts of vibration on surrounding environment

Electrical

237. Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:
- Marking all energized electrical devices and lines with warning signs;

- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance;
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools; .
- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits; .
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas; .
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work.

Eye Hazards

238. Solid particles from a wide variety of industrial operations, and/or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:
- Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Specific Safe Operating Procedures (SOPs) may be required for use of sanding and grinding tools and/or when working around liquid chemicals. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice. Machine and equipment guarding shall conform to standards published by organizations such as CSA, ANSI and ISO.

Welding/Hot Work

239. Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include: .
- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required. .
 - Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) shall be implemented if welding or hot cutting is undertaken outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Special procedures are required for hot work on tanks or vessels that have contained flammable materials.

Industrial Vehicle Driving and Site Traffic

240. Poorly trained or inexperienced industrial vehicle drivers have increased risk of accident with other vehicles, pedestrians, and equipment. Industrial vehicles and delivery vehicles, as well as private vehicles on-site, also represent potential collision scenarios. Industrial vehicle driving and site traffic safety practices include:
- Training and licensing industrial vehicle operators in the safe operation of specialized vehicles such as forklifts, including safe loading/unloading, load limits.
 - Ensuring drivers undergo medical surveillance.
 - Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms.
 - Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures (e.g. prohibiting operation of forklifts with forks in down position), and control of traffic patterns or direction.
 - Restricting the circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one-way' circulation, where appropriate.

Ergonomics, Repetitive Motion, Manual Handling

241. Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems shall be minimized or eliminated to maintain a productive workplace. Controls may include:
- Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind.
 - Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds.
 - Selecting and designing tools that reduce force requirements and holding times and improve postures. .
 - Providing user adjustable workstations.
 - Incorporating rest and stretch breaks into work processes and conducting job rotation.
 - Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
 - Taking into consideration additional special conditions such as left-handed persons.

Working at Heights

242. Fall prevention and protection measures shall be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:
- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area.
 - Proper use of ladders and scaffolds by trained employees. .
 - Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines. .
 - Appropriate training in use, serviceability, and integrity of the necessary PPE.
 - Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall.

Fire and Explosions

243. Fires and or explosions resulting from ignition of flammable materials or gases can lead to loss of property as well as possible injury or fatalities to project workers. Prevention and control strategies include:
- Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area shall be equal to 120% of the total volume of fuel stored.
 - Storing flammables away from ignition sources and oxidizing materials. Further, flammables storage area shall be:
 - Remote from entry and exit points into camps;
 - Away from facility ventilation intakes or vents;
 - Have natural or passive floor and ceiling level ventilation and explosion venting;
 - Use spark-proof fixtures;
 - Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to withstand flame impingement for a moderate period of time. .
 - Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment).
 - Providing specific worker training in handling of flammable materials, and in fire prevention or suppression.

- Emergency Response Plan has been attached as **Annexure F**.

Corrosive, oxidizing, and reactive chemicals

244. Corrosive, oxidizing, and reactive chemicals present similar hazards and require similar control measures as flammable materials. However, the added hazard of these chemicals is that inadvertent mixing or intermixing may cause serious adverse reactions. This can lead to the release of flammable or toxic materials and gases, and may lead directly to fires and explosions. These types of substances have the additional hazard of causing significant personal injury upon direct contact, regardless of any intermixing issues. The following controls shall be observed in the work environment when handling such chemicals:
- Corrosive, oxidizing and reactive chemicals shall be segregated from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water based, etc.), stored in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills. .
 - Workers who are required to handle corrosive, oxidizing, or reactive chemicals shall be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc.).
 - Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, qualified first-aid shall be ensured at all times. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work, and eye-wash stations and/or emergency showers shall be provided close to all workstations where the recommended first-aid response is immediate flushing with water.

Mitigation Measures for Biological Hazards

245. Biological agents represent potential for illness or injury due to single acute exposure or chronic repetitive exposure. Biological hazards can be prevented most effectively by implementing the following measures:
- The contractor shall review and assess known and suspected presence of biological agents at the place of work and implement appropriate safety measures, monitoring, training, and training verification programs.
 - Project contractor must provide good working and sanitation conditions at camp and wok sites. Disease surveillance shall be carried out to identify any exposure to parasites, such as hookworm, ascaris, and various mites, chiggers, ticks and dengue.
 - Measures to eliminate and control hazards from known and suspected biological agents at the place of work shall be designed, implemented and maintained in close co-operation with the local health authorities and according to recognized international standards.

6.3.6 Hazardous and Non-Hazardous Waste Management

Impacts

246. During construction/civil works potential sources of waste will include spoils generated during excavation of trenches, excavation waste for other civil works including park infrastructure, domestic wastes (solid & wastewater), fuel or oil leakages or spills, onsite effluents from vehicle wash & cleaning and cement spills.
247. Waste disposal of materials containing contents of both hazardous and non-hazardous nature such as scrap wood, bricks, concrete, asphalt, plumping fixtures, piping, insulation (asbestos and non-asbestos), metal scraps, oil, electrical wiring and components, chemicals, paints, solvents etc. can potentially become a serious environmental issue, particularly with the local contractors. To avoid any potential issue, the PMU in collaboration with focal agencies will need to impose adequate internal controls.
248. Domestic wastes generated during construction of the park will include sewage, grey water (from kitchen, laundry, and showers), kitchen wastes, combustible wastes and recyclable wastes from contractor camps.

Mitigation measures

249. A waste management plan will be developed prior to the start of construction. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste collection and an onsite hazardous waste storage facility i.e. designated area with secondary containment.
250. Licensed waste contractors will be engaged to dispose off all non-hazardous waste material that cannot be recycled or reused.
 - Excavated material from trenches will be stored at site and it will be used as fill/cover material after laying of the leachate and landfill gas pipelines, while access spoil shall be transported to spoil disposal site, if required.
 - Excavated material generated during construction of the park components will be used as a fill material within the project site and any excess spoil shall be transported to the spoil disposal site, if required.
 - All types of combustible and non-combustible waste, including plastic or glass bottles and cans will be temporarily stored on site and later sold/handed over to a waste/recycling Contractor, who will utilize these wastes for recycling purposes.
 - Waste management training for all site staff will be included in Contractor's training plan.
 - Fuel storage areas and generators will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored.
 - Fuel and hazardous material storage points will be included in camp layout plan to be submitted for approval. Hazardous material storage areas shall include a concrete

floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately.

- Designated vehicles/plant wash down and refueling points shall be included in camp layout plan to be submitted for approval.
- Hazardous waste will be initially stored on site at designated areas and then handed over to EPA certified contractor for final disposal.
- Record of waste generation and transfer shall be maintained by project Contractors.
- Spill kits, including sand buckets (or other absorbent material) and shovels will be provided.
- At the time of restoration, septic tanks will be dismantled and backfilled with at least 1m of soil cover keeping in view landscape of surrounding natural surface.
- It will be ensured that after restoration activities, the campsite is clean and that no refuse has been left behind.
- Any clinical waste will be temporarily stored onsite separately and will be handed over to approved waste contractor for final disposal.
- Training will be provided to personnel for identification, segregation and management of waste.
- The structure of a Framework waste management plan has been prepared for the project and attached as **Annexure M** and Contractors will be required to prepare waste management plan for the site in light of guidelines provided in the waste management plan and submit to PMU for approval.

6.3.7 Camp & Batching Plant Effluent

Impacts

251. The staff and labor camps for the construction of the proposed park will be a source of wastewater generated from the toilets, washrooms and the kitchen. The wastewater will not meet the national environmental standards and will therefore need treatment prior to disposal.
252. The project sites where construction is being conducted must not be treated by the project staff and/or labor as a public toilet or for disposal of camp effluent and construction waste.

Mitigation measures

- It will be ensured that no untreated effluent is released to the environment.
- A closed sewage treatment system including soak pits and septic tank will be constructed to treat the effluent from the construction/labor camps.
- Sewage treatment system will be installed at each respective labor camp based on the number of laborers residing at the respective camp.

- Wastewater from laundry, kitchen washings and showers will be disposed-off into soak pits or septic tank (where soak pit cannot be constructed) and after treatment it will be disposed of in TMA provided drains in the project area.
- Soak pits will be built in absorbent soil and shall be located 300 m away from a water well, hand pump or surface water body. Soak pits in non-absorbent soil will not be constructed.
- Ensure that the soak pits remain covered all the time and measures are taken to prevent entry of rainwater into them.
- Sprinkling of grey water or sewage will not be allowed; in case the septic tank gets filled with sludge, septic tank shall be emptied through vacuum truck and material shall be transferred to treatment facility or approved municipal drain.
- Water being released from any batching plant(s) must be treated as per requirements of NEQS prior to release to sewerage system/any other water body.
- Sewage at the end of construction period to be disposed of in nearest municipal drains after getting approval from concerned municipal authorities.

6.3.8 Soil Contamination

Impacts

253. During the project construction, spills of fuel, lubricants and chemicals can take place while transferring from one container to another or during refueling. Also, during maintenance of equipment and vehicles, through leakages from equipment and containers and as a result of traffic accidents.
254. Depending on the nature of the material, location of spill and quantity of spill, the soil can get contaminated.

Mitigation measures

- It will be ensured that spill prevention trays are provided and used during refueling. Also, on-site maintenance of construction vehicles and equipment will be avoided as far as possible. In case on-site maintenance is unavoidable, tarpaulin or other impermeable material will be spread on the ground to prevent contamination of soil.
- Regular inspections will be carried out to detect leakages in construction vehicles and equipment and all vehicles will be washed in external commercial facilities.
- Fuels, lubricants and chemicals will be stored in covered bounded areas, underlain with impervious lining. Appropriate arrangements, including shovels, plastic bags and absorbent materials will be available near fuel and oil storage areas.

6.3.9 Employment Conflicts

Impacts

255. The proposed park development is not likely to create any significant permanent job opportunities. Even unskilled and semi-skilled employment opportunities that are likely to be created will be for a short period during construction. As persons with relevant skills may be available locally, people from the project area are likely to fill a significant number of the semi-skilled and skilled jobs.
256. This issue of provision of jobs can become particularly problematic if it is perceived by the local population that a significant number of construction-related job opportunities are not given to people from the local community. This can result in friction between local residents and construction workers from outside of the community.

Mitigation measures

- The Construction Contractor will adopt a transparent hiring policy. Prior to the commencement of the construction activity, the local communities in the project area will be informed of the employment policy in place and number of people that can be employed for this project.
- It will be ensured that maximum number of unskilled and semi-skilled jobs will be provided to the residents of the project area.
- The PMU KPCIP will ensure a balanced process of employment of the communities in the project area with preference given to those most directly affected by the project.

6.3.10 Communicable diseases incl. COVID-19

Impacts

257. Communicable diseases such as COVID-19 and HIV may be introduced due to the immigration of workers associated with the project.
258. Ministry of National Health Services, Regulations and Coordination, GoP has issued guidelines in April, 2020 for Health & Safety of Building and Construction Workers during COVID-19 outbreak. These guidelines are prepared for the workers involved in building and construction work during the current epidemic of COVID-19. These guidelines provide the safety measures to be implemented at the construction site having a dusty environment, continuous flow of different materials and make-shift type of arrangements for storage, food and sanitation calls for implementation of safety precautions at the very basic level of personal hygiene only.

Mitigation measures

259. A communicable diseases prevention program will be prepared for construction workers or residents near the construction sites.

COVID-19 specific measures WHO

- All workers must perform complete sanitization at the site as per SOPs/guidelines issued by WHO and the national guidelines issued by the Government of Pakistan (GOP)¹⁹.
 - All workers must wear a mask as soon as they arrive at site and must keep wearing it at all times while present at the work site/hospital premises. The WHO guidelines on use of masks are provided as **Annexure L**.
 - As soon as workers arrive at work site, their body temperature must be checked and in case any worker is assessed to be running a fever or suffering from a flu or cough, he must be informed to leave immediately and self-isolate for a two-week period and not report for work until this two-week mandatory period has been completed.
 - At the work site(s), social distancing measures must be strictly implemented and gathering of workers at any location at the work site(s) must be strictly forbidden. In case of workers not taking this measure seriously, strict penalties must be imposed to ensure implementation.
 - The work tasks must be divided into shifts, as far as possible, to reduce the workforce present at the work site(s) at any one moment and improve the working speed/efficiency.
 - All workers will be strictly advised to wash their hands as frequently as practicable and not to touch their face during work.
 - A supply of safe drinking water will be made available and maintained at the project site(s).
 - COVID awareness sign boards must be installed at the camp clinic and at the work site(s).
 - Contact details of all workers will be kept in a register on site in order to efficiently trace and manage any possible workers that might experience symptoms of COVID-19.
 - Prohibition of entry for local community/any unauthorized persons at work sites.
 - Proper hygiene practices in the toilets and washrooms will be implemented with proper and adequate use of soaps and disinfectant spray.
 - Social distancing must be maintained during the pick-up and dropping off of workers from their residences to and from the work site(s).
 - All indoor areas must be well ventilated.
260. WHO advice on Use of Masks for the COVID-19 Virus has been attached as **Annexure L**.

¹⁹ <https://covid.gov.pk/guideline>

COVID-19 specific measures GOP**Advice for Site Managers:**

- Every construction project shall make proper arrangements for uninterrupted building services including but not restricted to, electricity, fuel, water supply, water disposal and sanitation, communication links, washrooms with hand hygiene and shower facility and with proper and adequate supply of soaps and disinfectants.
- Workers shall not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site.
- Ensure the availability of the thermal gun at the entry and exit of the construction site and no worker shall be allowed without getting his/her temperature checked.
- Site manager must maintain a register of all contact details with NID number and addresses of all present at the site in case a follow up or tracing and tracking of contacts is required at a later stage.
- Develop the employee roaster to decrease the number of people on the site very day. Split the shifts of the workers in morning and evening with limit of each shift to 8 working hours.
- Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours end.
- In addition to all other internationally recognized safety precaution for construction workers and other staff, every individual must be provided with a face mask. It must be ensured that everyone during his or her presence at the site continues to wear the mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands.
- Non-essential work trainings must be postponed avoiding gathering of people.
- Ensure the physical distance by creating more than one route of entry and exit to the site.
- Instruct the workers to inform the construction manager (or authorities) if
 - They develop any symptoms of cough, flu or fever.
 - They have been exposed to someone suspected or confirmed with COVID 19.
 - They have met someone who has a travel history of COVID 19 endemic country. They have travelled in last couple of days or plan to travel soon.
- All incidences of appearance of the symptoms of COVID-19 shall be immediately documented and maintained at the site and information regarding which shall be immediately communicated through e-mail or else, to the designated health facility, and the sick worker shall be transported to the health facility for further advice and action. The site manager must establish a link with a nearby healthcare facility with

arrangements for quick transportation of workers in case of an emergency.

- Persuade the workers to inform the authorities for their safety and of other if they observe any signs and symptoms in a colleague.
- Do not allow any worker at the construction site who has the symptoms.
- Display the awareness banners about hand hygiene and physical distancing, where you can, around the work site.
- Everyone on the construction site must observe sneezing and coughing etiquettes. Workers shall be requested and required to wash their hands as frequently as practicable and shall also be advised not to touch their face with their hands during work.
- Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix.
- Only sanitizable dining surfaces shall be used, which must be cleaned before each service.
- The lunch breaks and stretch breaks of the workers must be staggered to avoid the clustering of workers. Workers must not sit at less than 2 meters distance while having meals and while any other activity requiring interpersonal communications in a well ventilated area.
- In the wake of current restrictions on transportation, site managers will ensure safe transport arrangements for workers, which shall not be crowded and shall have social distancing in place during the entire process from pickups till drops at destination and must be well ventilated.
- In case of workers sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms in a well ventilated area.
- A supply of safe drinking water must be made available at the project site and maintained.

Advice for Construction Workers:

- All possible and prescribed measures shall be taken to ensure your and others health. Enter your contact details in the register maintained at the site, in case a follow up or tracing and tracking of contacts is required at a later stage.
- Follow hygiene practices at washrooms and shower facility with proper and adequate use of soaps and disinfectants.
- Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours end.

- In addition to all other internationally recognized safety precaution for construction workers and other staff, every individual must use face mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands.
- Workers shall wash their hands as frequently as practicable and shall not touch their face with their hands during work.
- Everyone on the construction site must observe sneezing and coughing etiquettes.
- Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix.
- Sick worker shall immediately inform the site manager and must get medical advice from nearby health Centre.
- Only sanitizable dining surfaces shall be used.
- Do not sit at less than 2 meters distance while having meals and while any other activity requiring interpersonal communications in a well ventilated area.
- Do not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site.
- Use safe transport arrangements which shall not be crowded and shall have social distancing in place during the entire process from pickups till drops at destination.
- In case sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms in a well ventilated area.

Deliveries or Other Contractors Visiting the Site:

- Non-essential visits to the construction sites shall be cancelled or postponed.
- Delivery workers or other contractors who need to visit the construction site must go through temperature check before entering and shall be given clear instructions for precautions to be taken while on site.
- Designate the workers, with protective gears or at least masks, to attend to the deliveries and contractors.
- Make alcohol-based hand sanitizer (at least 70%) available for the workers handling deliveries.
- Instruct the visiting truck drivers to remain in their vehicles and whenever possible make use of contactless methods, such as mobile phones, to communicate with your workers.
- All indoor areas must be well ventilated.

6.3.11 Construction of Administration Building and Other Infrastructure

Impacts

261. The proposed park will have an administration building and some other infrastructure, as felt necessary to manage the various operations of the park.
262. Soil erosion is the main expected impact during construction of the building infrastructure. Construction of other facilities have also been historically perceived and in some cases has actually led to soil erosion. The possibility of soil erosion has been assessed in detail in the following paragraphs.
263. The possibility of soil erosion from a human activity increases when soil particles are detached from the soil mass. This is true for agricultural lands where a certain landscape is changed and the area is left exposed to wind and water erosion and also for dirt tracks which are developed through continual use by vehicles and the soil surface is subject to continual erosion for as long as the track is used. However, these cases are different from scenarios in which the soil surface initially disturbed is sealed or compacted by engineering means. For example, metalled roads are not subject to soil erosion, similarly neither would the gravel-topped roads which will be compacted to sustain loads.
264. Other environmental impacts from construction of building and other infrastructure include construction debris, unattended concrete and cement waste, brick waste, littering and empty cement bags which required to be disposed off as per waste management plan. Flooring works will add to slurry waste resulting from grinding activities. Noise from mixing plants, steel fixing works, wood works is another source of environmental nuisance which will be managed. Use of generators, vehicles and machinery may be a source of air pollution, if not managed.
265. On the basis of the above it can be assessed that on a macro level, environmental impacts from construction of buildings and associated infrastructure will not be a significant issue as all these impacts will be managed through implementation of the site specific EMMP, to be prepared by the Contractors and approved by the CSC/PMU.

Mitigation measures

266. Following are the mitigation measures that will be employed to manage impacts from construction of building and associated infrastructure:
 - Water will be sprinkled regularly to suppress dust emissions. Off road travelling of vehicles will be prohibited.
 - Stock piles will be appropriately located and out of wind to avoid dust emissions. Dry dusty materials shall be sprinkled with water and properly covered to avoid dust emissions.
 - No cement and concrete waste will be left unattended. Construction debris will not be thrown from height to avoid dust emissions. Return unpaved areas to original or improved contours following construction.

- Solid waste generated from construction of admin building will be managed through site specific EMMP and no waste will be stored at site to improve housekeeping at site and to avoid environmental nuisance.
- Set protocols for proper and regular maintenance of construction machinery, vehicles and generators. Generators that will be used will be placed at suitable locations.
- Contractor will not be allowed to store bulk quantities of fuel or hazardous material at site.
- Any fuel or chemicals stored at site (in small quantities) will be stored at designated site and containers/storage vessels be properly marked for their contents. Storage area will be provided with hard impervious surface and secondary containment.
- Equipment and machinery with loose vibratory parts will not be allowed to use. Used equipment and machinery will be in compliance to NEQS.
- Waste bins will be provided at appropriate places to manage waste. Daily housekeeping of the construction area will be carried out.

6.3.12 Site restoration

Impacts

267. After completion of construction activity, the project facilities will be restored as close to its original condition as possible. One of the important tool is the photographic record of project facilities e.g., campsite(s) prior to set-up will be taken and will be compared after site restoration.
268. Unattended construction waste and excavated material in the park premises will be source of bad aesthetics. Before closure of any typical construction day, the area will need to be cleared from all types of waste and construction material.

Mitigation measures

- Demobilization of all equipment and machinery;
- Disposal of any waste material remaining at the time of completion of the operation;
- Backfilling of all excavation, followed by compaction;
- Dismantling and removal of fence or barriers surrounding the campsite area; and
- General restoration of the site area, including landscaping and restoration of drainage where required;
- PMU KPCIP, through CSC, will ensure that restoration of construction works will be carried out by Contractors;
- PMU KPCIP will ensure periodic monitoring of such restorations;

- Contractors will develop site restoration protocols and will submit to CSC/PMU for review and approval;
- Construction site restoration protocols will be part of bidding documents and constructions contracts;
- Construction Contractor will add restoration costs into the BOQ documents.

6.3.13 Vegetation and Wildlife Loss

Impacts

269. The proposed park site located in a rural environment in the outskirts of Abbottabad city with limited human settlements and activities. The site is presently being used as a waste dumping site and contains very limited vegetation cover and minimal wildlife, of any significance.
270. No impact on vegetation and wildlife is expected due to limited vegetation cover within the project site. There are only few trees, some minor shrubs and bushes that will be cleared up, if felt necessary, during the site preparation stage of the project. In addition, 1,064 trees and 1,052 shrubs and flowering plants will be added to the site to increase the green cover of the area.

Mitigation measures

- Consideration will be given to the visual appearance of the park site during operation. A considerable area has been allocated for plantation to improve landscape of the area;
- Off-road travel will be strictly prohibited and observance of this will be monitored during execution of the project;
- Vehicle speeds will be regulated and monitored to avoid excessive dust emissions;
- No hunting or killing of animals will be permitted;
- No cutting down of vegetation or using vegetation or trees as firewood will be permitted.

6.3.14 Historical/Archaeological Sites

Impacts

271. No historical/archaeological sites have been identified in the project area or project site.

Mitigation measures

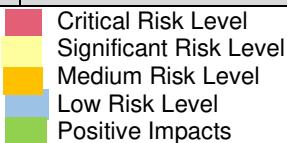
272. If evidence of any archaeological remains is found during the construction activities, the excavation work will be stopped immediately, and necessary next steps taken to identify the archaeological discovery based on the 'Chance Find' procedures provided as **Annexure G**.

6.4 Operation Phase

273. The potential impacts from operation of the park are provided as **Table 6.5** below.

Table 6.5: Screening of Possible Impacts during Operation Phase

S/No.	Potential Issues	Likelihood (Certain, Likely, Unlikely, Rare)	Consequence (Catastrophic, Major, Moderate, Minor)	Risk Level (Significant, Medium, Low)	Residual Impact (Short term, Long term)
1	Generation of solid waste	Likely	Major	Medium	Long Term
2	Leachate collection and management system and methane gas collection and ventilation system	Likely	Major	Medium	Long Term
3	Septic tank effluent disposal from washroom toilets	Likely	Major	Medium	Long Term
4	Generation of job opportunities	Positive impacts expected			Long term positive residual impact
5	Improved aesthetics and public health in area due to site remediation and removal of odor and disease vectors	Positive impacts expected			Long term positive residual impact
6	Prevention of contamination of Salhad Nala from dumped waste	Positive impacts expected			Long term positive residual impact
7	Improvements in Public Health	Positive impacts expected			Long term positive residual impact



6.4.1 Generation of solid waste

Impacts

274. Solid waste generated from the park operation will include sewage, grey water (from kitchen, laundry, and showers), combustible wastes and recyclable waste.
275. Sewage and grey water from the Administration building and any other buildings on the park premises shall be drained into the nearest municipal drain;

276. Recyclable waste generated from administration building will be paper, cardboard and small plastic items and tin items. These items shall be stored temporarily and sent to recycling facilities located in Abbottabad or Peshawar.
277. Non-recyclable waste such as food waste etc. shall be transported to the landfill site for ultimate disposal.

Mitigation measures

278. A waste management plan for operation phase will be developed. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the park premises for waste disposal.
279. Licensed waste contractors will be engaged to dispose off all non-hazardous waste material that cannot be recycled or reused.
 - All types of combustible and non-combustible waste including plastic or glass bottles and cans will be temporarily stored on site and later sold/handed over to a waste/recycling Contractor, who will utilize this waste for recycling purposes.
 - Waste management training for all park staff will be included in the training plan.
 - Fuel storage areas and generators (if required) will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored.
 - Fuel and hazardous material storage points will be included in the layout plan to be submitted for approval. Hazardous material storage areas will include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately.
 - Designated drains for vehicles wash down shall be constructed and layout plan to be submitted for approval.
 - Any hazardous waste generated at the park premises will be initially stored on site at designated area and then handed over to EPA certified Contractor for final disposal.
 - Record of waste generation and transfer shall be maintained by project Contractor(s).
 - Training will be provided to personnel for identification, segregation and management of waste.
 - The structure of a Framework waste management plan has been prepared for the project and attached as **Annexure M**.
 - WSSC Abbottabad will be required to prepare waste management plan for the site in light of guidelines provided in the waste management plan and submit to PMU for approval.

6.4.2 Leachate collection and management system and methane gas collection and ventilation system

Impacts

280. The collection and management of leachate and methane gas can result in certain potentially significant impacts in case of leakage and/or bursting of the piping networks etc. while accumulation of methane gas at high pressures due to failure of gas venting systems can lead to explosions with possible loss of property and life.

Mitigation measures

- Regular preventive maintenance checks will be conducted to ensure any leakages and/or pipe bursts are immediately identified and necessary corrective steps are taken.
- In case of any contamination due to leakage of leachate from the pond or pipeline from the site to the pond, a detailed remedial plan shall be developed and will be in place to control the contamination of both groundwater and surface water.
- Public will not be allowed to access the leachate storage pond and methane gas collection area.
- Emergency response plan, provided as **Annexure F**, shall be implemented in case of a leak or explosion at the park facility.

6.4.3 Septic tank effluent disposal from washroom toilets

Impacts

281. The septage to be collected in the septic tank on the park premises from the washroom toilets will need to be managed and disposed off in an environmentally sustainable manner since otherwise it could lead to ground water and surface water contamination along with generation of disease vectors and deterioration of the aesthetics of the area.

Mitigation measures

282. The septage from the septic tank will be disposed off in accordance with established SOPs that will be strictly implemented to ensure the septic tank is well maintained and is emptied at a regular frequency before it reaches full capacity.
283. The septage will be transported in accordance with international good practices and will be disposed off at a location pre-approved by WSSCA, such as the nearest sewage treatment plant.

6.4.4 Creation of job opportunities

Impacts

284. The proposed park will create job opportunities and open up avenues for income generation, thereby improving the socioeconomic condition of the local people and help in improving their quality of life.

Mitigation measures

No measures required.

6.4.5 Improved aesthetics and public health in area due to site remediation and removal of odor and disease vectors

Impacts

285. The site remediation and prevention of any further waste being dumped on the site will ensure the aesthetics of the area are greatly improved which will have multiple additional benefits such as removal of odor and generation of disease vectors from the dumped waste. In addition, this will lead to an improvement in the public health of the residents of the project area.

Mitigation measures

No measures required.

6.4.6 Prevention of contamination of Salhad Nullah from dumped waste

Impacts

286. The site remediation and prevention of any further waste being dumped on site will greatly improve the water quality of the Salhad Nullah, flowing through the western part of the site, which is presently quite contaminated.
287. Monitoring of the Salhad Nullah will continue once park operation commences to ensure it is not being contaminated.

Mitigation measures

No measures required.

6.5 Cumulative Impacts

288. Based on the scoping exercise of the site and based on discussions with the public sector agencies responsible for development in the project area. No other infrastructure works are planned to be conducted in the project area while these project works shall be conducted. Thus, no cumulative impacts are expected.

6.6 Indirect and Induced Impacts

289. The potential impact of proposed park development in the project area has been examined, which indicated that the existing and planned infrastructure such as water supply, wastewater collection and treatment, municipal solid waste collection and disposal would be adequate to accommodate any potential population intake and associated demand. Impacts from the park development on the environment from air emissions, traffic and community noise have also been assessed and have found to be acceptable and within the carrying capacities of the environmental media.
290. Thus, negative indirect and induced impacts from the proposed park development are not expected during the operation phase. During construction phase, indirect impacts related to social nuisance are anticipated, resulting from the delayed or halted construction works. Such issues will be short term in nature and will be managed through effective coordination and GRM proposed for the project.

7 Environmental Management Plan & Institutional Requirements

7.1 Introduction

291. The IEE has identified potential impacts that are likely to arise during the proposed park development in detail, both negative and positive impacts at each stage of the project. To minimize the effects of adverse impacts the IEE has recommended mitigation measures in the EMP. The proposed mitigation measures have been based on the understanding of the sensitivity and behavior of environmental receptors in the project area, the legislative controls that apply to the project and a review of good industry practices for projects of similar nature. For residual impacts (impacts remaining after applying the recommended mitigation measures) and for impacts in which there can be a level of uncertainty in prediction at the IEE stage, monitoring measures have been recommended to ascertain these impacts during the course of the project activities.
292. The Environmental Management Plan (EMP) is developed to eliminate and/or mitigate the impacts envisaged at the design, construction and operation stages.
293. The detailed EMP provided in this document as **Table 7.1** ensures the park development has no detrimental effect on the surrounding environment. The Plan shall act as a guideline for incorporating environmental measures to be carried out by the Contractors engaged for the proposed project. It shall also be used for other parties concerned for mitigating possible impacts associated with each project and will form part of the Contract documents to be considered alongside the specifications. This Plan shall act as the Environmental Management and Monitoring Plan during the construction and operation phase of the project and will allow for prompt implementation of effective corrective measures.

7.2 Environmental Management Plan (EMP)

294. The EMP attached with this report ensures the following:
 - Delivery of the prescribed environmental outcomes during all phases of this sub-project;
 - Formulating a system for compliance with applicable legislative requirements and obligations and commitments for this sub-project;
 - Ensure that project design process incorporates best practice environmental design and sustainability principles to minimize potential impacts of construction and operation on the environment and community;
 - Ensure that the construction and operation work procedures minimize potential impacts on the environment and community;
 - Develop, implement and monitor measures that minimize pollution and optimize resource use.

7.3 Objectives of EMP

295. The EMP provides a delivery mechanism to address potential impacts of the project activities, to enhance project benefits and to outline standardized good practices to be adopted for all project works. The EMP has been prepared with the objectives of:
- Defining the roles and responsibilities of the project proponent for the implementation of EMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the project;
 - Outlining mitigation measures required for avoiding or minimizing potential negative impacts assessed by environmental study;
 - Developing a monitoring mechanism and identifying requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the study;
 - Defining the requirements for communication, documentation, training, monitoring, management and implementation of the mitigation measures.

7.4 Environmental Management Monitoring and Reporting

296. During the construction phase, the overall responsibility for the implementation and monitoring of the EMP rests with the Project Director (PD), Project Management Unit (PMU), and KPCIP. The PD at the PMU, using the CSC, will supervise the implementation of the proposed mitigation measures and monitor the implementation progress in the field.
297. During the operation phase, the overall responsibility for the implementation and monitoring of the EMP rests with CEO WSSCA. Project will be administered and monitored through City Implementation Unit (CIU) that will be developed within WSSCA which will deliver services based on indicators sets out in Services and Assets Management Agreement (SAMA).
298. The specific roles and responsibilities for environmental management and monitoring are provided in **Table 7.1** below. The expected costs for implementing any required mitigation measures are provided in **Table 7.7** below.

7.4.1 Inclusion of EMP in Contract documents

299. In order to make Contractors fully aware and responsible of the implications of the EMP and to ensure compliance, it is recommended that mitigation measures be treated separately in the tender documentation and that payment milestones shall be linked to performance, measured by execution of the prescribed mitigation measures. Such a procedure would help ensure adequate management of project impacts is carried out during the construction and operation phases, where a consistent approach will be expected on behalf of the Contractor and its sub-contractors so that data and information collected from monitoring programs is comparable with baseline monitoring data.
300. The Contractor shall be made accountable through contract documents and/or other agreements for fulfilling the environmental safeguard obligations and delivering on the environmental safeguard components of the Project. Contractors shall be prepared to co-operate with the executing agency and supervising consultants and local population for

the mitigation of adverse impacts. After the EMP's inclusion in the contract documents, the Contractor will be bound to implement the EMP and will engage appropriately trained environmental and social management staff to ensure the implementation and effectiveness of the mitigation measures.

301. The Contractor is required to bid for executing the EMP, including the recommended mitigation measures and monitoring programs, as part of its Bill of Quantities (BOQ).

7.5 Institutional Arrangements

302. The environmental management plan will require involvement of the following organizations for its implementation during construction and operation phases of the project:

7.5.1 Role of PMU, KPCIP, LGE RDD

303. The PMU will:

- Provide support to ADB missions;
- Coordinate activities with all stakeholders, review consultants, proposals, and provide overall guidance during various stages of project preparation;
- Manage and ensure safeguard due diligence and disclosure requirements including resettlement and environmental safeguards in accordance with ADB's Safeguard Policy Statement (2009) and KP government requirements;
- Manage and ensure effective implementation of the gender action plan;
- Ensure submission of all IEE requirements as per law by responsible entities; and
- Monitoring of activities of the entire project.

7.5.2 Role of the ADB

304. The ADB will:

- Support the coordination and administration of the project;
- Provide guidance to PMU KPCIP and WSSCA on implementation issues and project design;
- Disclose all safeguards documents, and monitor safeguards implementation;
- Monitor and report project performance;
- Conduct periodic review of the project;

7.5.3 Role of Construction Supervision Consultant (CSC)

305. The CSC will be responsible for the following items:

- Incorporates into the project design the environmental protection and mitigation measures identified in the EMP for the design stage;
- Assists PMU to ensure that all environmental requirements and mitigation measures from the IEE and EMP are incorporated in the bidding and contracts documents.
- Prior to construction, reviews the updated SSEMPs prepared by the contractor.
- Undertakes environmental management capacity building activities for relevant project focal staff including staff from contractors

7.5.4 Role of KP EPA

306. The KP EPA will have the following responsibilities with regards to this project:

- Provides regulatory compliance works for the project;
- Reviews and approves environmental assessment report, submitted by PMU;
- Issues environmental clearance certification for the Project based on their mandate and regulations;
- Undertakes monitoring of the project's environmental performance based on their mandate.

7.5.5 Role of Project Contractor

307. The project contractor will be responsible for following items:

- Implementation of, or adherence to, all provisions of the IEE and EMP;
- Preparation of site specific EMPs (SSEMPs) as required. SSEMPs will be prepared by Contractor's Environment Specialist, site in charge, HSE staff and project technical team before their mobilization and it will be submitted to Engineer of construction supervision consultant/PMU for review and approval. Site Specific EMP (SSEMP) Guide & Template for Guidance to Contractor has been attached as **Annexure I**;
- Contractor's environmental performance will rest with the person holding the highest management position within the contractor's organization. Reporting to their management, the contractor's site managers will be responsible for the effective implementation of the EMP;
- The Contractor will be required to have qualified Environmental Specialists in their team to ensure all mitigation measures are implemented during the different development phases of the project.

7.5.6 Role of WSSCA

308. The WSSCA will be responsible for following items:
- Implementation of, or adherence to, all provisions of the IEE and EMP;
 - Preparation of site specific EMPS for operations phase;
 - WSSCA would be responsible to ensure that contractors engaged during operation phase are executing activities in compliance to IEE/EMP;
 - WSSCA will be required to have qualified Environmental Specialist designated to ensure all mitigation measures are implemented in true letter and spirit.
 - WSSCA will design and drive behavior change campaigns to increase public participation and cooperation. Public cooperation will be extended through incentives and penalties to the public.
 - WSSCA will plan customer feedback surveys in order to ensure sustainable service delivery and to remove gaps in the system.

7.5.7 Role of Third Party Design Experts

309. A team of experience third party design experts were engaged for vetting of the detailed designs for the leachate and landfill gas collection systems to ensure the designs are robust.
310. These experts reviewed the detailed designs and provided their comments and recommendations for any gaps and/or possible improvements that needed to be made in the designs.

7.6 Monitoring Parameters

311. A monitoring plan for the pre-construction/design, construction and operation phases of the project, indicating environmental parameters, frequency and applicable standards is provided below as **Table 7.2**, **Table 7.3** and **Table 7.4** below.
312. During the procurement/pre-construction period, the monitoring activities will focus on (i) checking the contractor's bidding documents, particularly to ensure that all necessary environmental requirements have been included; and (ii) checking that the contract documents' references to environmental mitigation measures requirements have been incorporated as part of contractor's assignment and making sure that any advance works are carried out in good time.
313. During the construction period, the monitoring activities will focus on ensuring that any required environmental mitigation measures are implemented to address possible impacts.
314. In general, the construction impacts will be manageable, and no insurmountable impacts are predicted, provided that the EMP is implemented to its full extent as required in the Contract documents. However, experience suggests that some Contractors may not be

familiar with this approach or may be reluctant to carry out some measures. For the proposed project, in order that the Contractor is fully aware of the implications of the EMP and to ensure compliance, environmental measures must be costed separately in the tender documentation and listed as BOQ items, and that payment milestones must be linked to environmental performance, Vis a Vis the carrying out of the EMP.

315. The effective implementation of the EMP will be audited as part of the loan conditions by ADB, and as part of regulatory/NOC compliance by KP EPA. In this regard, the PMU/CSC will guide the design engineers and Contractors on the environmental aspects and necessary EMP documentation. Monitoring during operation phase of the park will be carried out by WSSC Abbottabad with support from PMU.

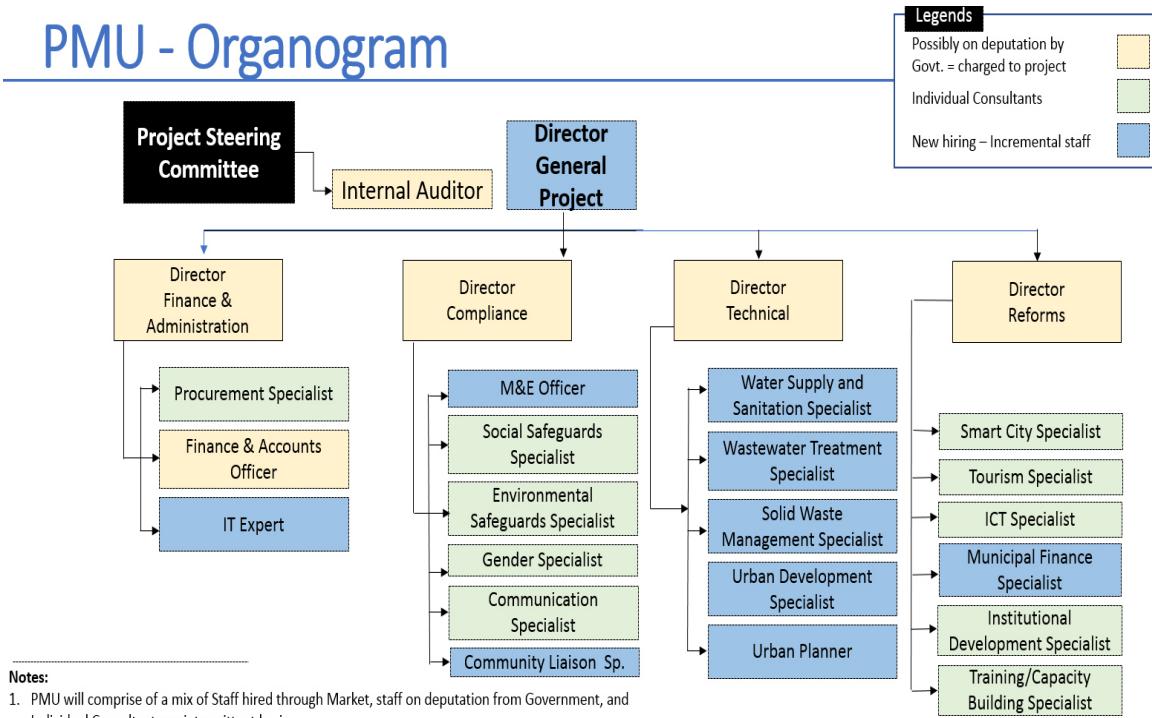
7.7 Environmental Training

7.7.1 Capacity Building and Training

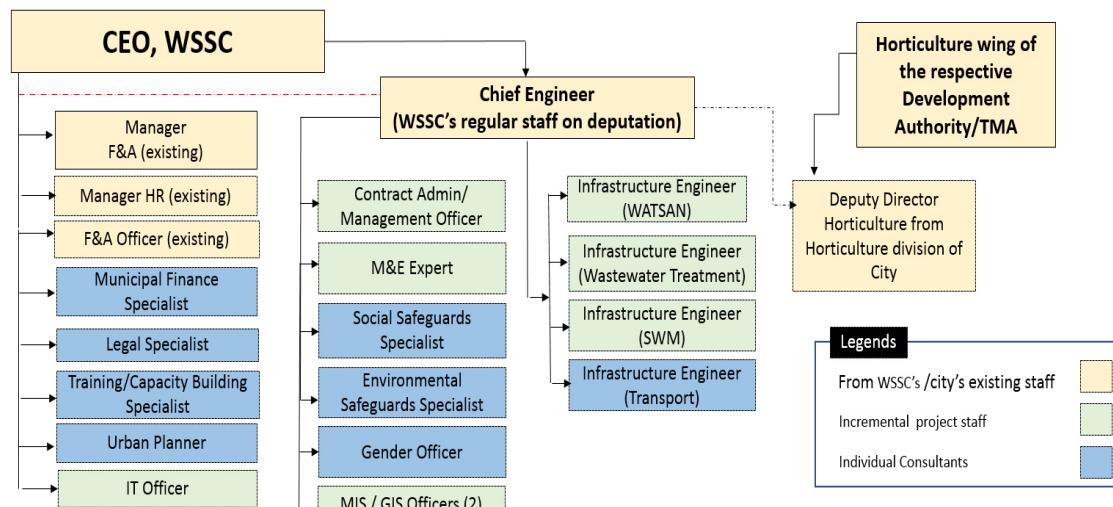
316. Capacity building and training programs are necessary for the project staff in order to control the negative impacts resulting from the project construction and during its operation phase. They will also require trainings on monitoring and inspecting of such a project for environmental impacts and for implementation of mitigation measures.
317. The details of this capacity building and training program are presented in the **Table 7.5**

7.8 Environmental Staffing and Reporting Requirements

318. EMP implementation would be responsibility of all project stakeholders including PMU, WSSCA, Project Construction contractors, O&M contractor and other suppliers involved in the project. Requirement of environmental staffing will be part of bidding documents and necessary cost will be allocated as BOQ item by the bidder. PMU will maintain environmental safeguard staffing (Environmentalist/Environment Associate) for construction and operation phase of the project to monitor and supervise EMP implementation and performance. Environment expert will also be part of CSC technical team and will produce bi-weekly and monthly environmental compliance reports during construction phase.
319. Environment expert of CSC will be responsible to monitor the implementation of EMP during construction phase by project Contractors. Project Contractors will also hire sufficient environmental officers to implement the EMP requirements and prepare necessary EMP documentation. Project Contractor EMP staff will prepare daily environmental reports and submit to CSC for approval and record. Within city implementation unit (CIU), WSSCA will hire qualified environmental specialist during operation phase of the project who will be responsible for EMP implementation and reporting by WSSCA and its O&M contractors during operation. Monthly environmental compliance report will be prepared by WSSCA and circulated to concerned authorities.
320. Organogram of PMU KPCIP within LGERDD and City implementation unit (CIU) within WSSCs is provided as **Figure 7-1 and 7-2**.

Figure 7-1: Proposed Organogram of PMU KPCIP**Figure 7-2: Proposed Organogram of CIU WSSC Abbottabad**

CIU - Organogram



* CIU will have these positions according to their respective subsector portfolio.

F&A = finance and Administration, GIS = geographic information system, M&E = monitoring & evaluation, SWM = solid waste management, WATSAN = water supply and sanitation, TMA = tehsil municipal authority, WSSC = water supply and sanitation company

Table 7.1: Environmental Management Plan

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility	Execution	Monitoring	Timing
Design/Pre-Construction Phase	1.1	Unsuitable locations for disposal of solid waste dumped on site as part of site remediation	<ul style="list-style-type: none"> ▪ The WSSC Abbottabad must ensure, at the earliest, the identification of a suitable location for disposal of the solid waste already dumped at the proposed park site as part of the site remediation. The identification of this dumping location must be based on a detailed and comprehensive environmental and social safeguards assessment. ▪ This alternative site identified will be used for solid waste dumping until the SWMF at Dhamtor becomes operational. 	EDCM		PMU	BC: during detailed designing of the sub-project
	1.2	Insufficient site investigations leading to incomplete site remediation	<ul style="list-style-type: none"> ▪ A detailed and comprehensive plan must be developed for the site investigations, consisting of allocation of necessary resources and technical expertise to ensure all aspects of the site from a technical and safeguards viewpoint are assessed. ▪ Based on these detailed site investigations, a comprehensive and robust site remediation plan must be developed for implementation by the Contractor. 	EDCM		PMU	BC: during detailed designing of the sub-project
	1.3	Inadequate designing of leachate and landfill gas piping systems leading to risks to settlements in project area	<p>It shall be ensured that all detailed designs are vetted by third party experts to ensure the designs are robust and all possible leachate and landfill gas leakage scenarios have been assessed to ensure no long term impacts from an environmental safeguards standpoint take place.</p>	PMU	-		BC: during detailed designing of the sub-project
	1.4	Lack of integration of IEE/EMP	<ul style="list-style-type: none"> ▪ The proposed 'Safeguards unit' that will be developed at the PMU will be assigned the task to check that design and bid documents are 	EDCM		PMU	BC: during detailed

Project Activities	Sectio n	Impact	Mitigation Measures Recommended	Responsibility	Execution	Monitoring	Timing
		requirements into Construction bid documents	<p>responsive to key environmental, social and safety considerations, and that the proposed method of work reflects the boundaries defined in the EMP. The bid documents must include the EMP and its implementation cost must be reflected in the BOQ.</p> <ul style="list-style-type: none"> ▪ IEE/EMP implementation and monitoring requirements must be part of bidding documents and necessary contractual binding must be agreed by project contractors before award of contract. ▪ Project contractors shall have qualified and experienced environmental staff to plan, arrange, implement, monitor and report IEE/EMP requirements 				designing of the sub-project
	1.5	Material Haul Routes	The construction vehicles hauling materials along the Abbottabad city roads and anywhere where there are sensitive receptors such as hospitals, schools and/or roadside residences will be limited and the PMU in collaboration with the focal agencies will establish a route plan to minimize this disruption which shall be appended to the EMP.	EDCM	PMU		BC: during detailed designing of the sub-project
	1.6	Inadequate Contractor's Environmental Safeguards Capacity	<ul style="list-style-type: none"> ▪ PMU KPCIP shall review the contractor capacity with respect to safeguard management and contracts shall be awarded accordingly. ▪ The Contractor will be required to define an Occupational and Environmental Health and Safety procedure for all work, including work camp operation, management of cement dust, and use of Personal Safety Equipment. These procedures shall be developed and approved by the PMU in collaboration with the focal agencies before the 	PMU	-		BC: during detailed designing of the sub-project

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>Contractor commences any physical works on ground.</p> <ul style="list-style-type: none"> ▪ PMU KPCIP shall ensure the project contractors are selected on merit and necessary funds has been allocated in the contract documents for EMP implementation and monitoring. 			
	1.7	Identification of Locations for Labor Camps and ancillary facilities	<ul style="list-style-type: none"> ▪ In order to prevent a nuisance, specific locations shall be designated for development of the labor camps. All necessary facilities and amenities shall be provided in these camps such as resting area, drinking water, electricity, supply of water. ▪ Solid and liquid effluent waste disposal facilities shall also be designed to cater waste of administration/office building etc. ▪ The use of proper planning while identifying locations for the labor camps will ensure there is minimal disturbance to all key receptors and the traffic is not disrupted by labor camps being set up roadside next to the construction sites. 	PMU		BC: during detailed designing of the sub-project
	1.8	Impacts due to Natural hazards	<ul style="list-style-type: none"> ▪ The PMU KPCIP shall ensure the proposed park infrastructure shall be designed keeping in view the seismic zone 3 building considerations. ▪ Surface water diversion shall be included in the design to protect the park infrastructure from potential flash flooding of Salhad Nullah. ▪ Extreme precipitation events analysis shall be performed for i.e. 100 years, to predict and manage impacts of flash flooding on the park infrastructure. ▪ On site waste storage shall be kept to minimum during high precipitation events. 	EDCM	PMU	BC: during detailed designing of the sub-project

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Infrastructure built by the project will be designed to withstand high speed winds. ▪ Water permeable surfaces such as pavers/paving stones will be used in the parking lot, walking track, restroom and administration building area to reduce flooding (and possibly recharge the groundwater). ▪ Emergency response plan shall be prepared by construction and operation phase Contractors and will be submitted to PMU for approval to manage impacts of natural hazards such as earth quakes and floods. 			
	1.9	Impacts due to existing utilities	<ul style="list-style-type: none"> ▪ The PMU KPCIP shall ensure the proposed infrastructure shall be designed keeping in view the minimum disturbance to existing utilities. ▪ CSC will ensure that project contractors will perform condition assessments prior to any excavation works and will inform CSC/WSSC Abbottabad about the presence of any existing utilities at the project site. ▪ In case if there is need of shifting of any utility, utility custodian department will be taken on board by WSSC Abbottabad for necessary approvals and information. ▪ PMU KPCIP/WSSC Abbottabad will pay compensation to damage of utilities to utility owners and will ensure that there will be no grievances in this regard. 	EDCM	PMU	BC: during detailed designing of the sub-project
Construction Phase	2.1	Degradation of air quality due to construction works	<ul style="list-style-type: none"> ▪ At the project site and the immediately adjoining areas, water will be sprinkled every three hours and at a higher frequency if felt necessary, at all construction sites to suppress dust emissions. 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<ul style="list-style-type: none"> ▪ All heavy equipment and machinery shall be fitted in full compliance with the national and local regulations. ▪ Stockpiled soil and sand shall be slightly wetted before loading, particularly in windy conditions. ▪ Fuel-efficient and well-maintained haulage trucks shall be employed to minimize exhaust emissions. ▪ Vehicles transporting soil, sand and other construction materials shall be covered with tarpaulin. ▪ Limitations to speeds of such vehicles as felt necessary. Transport through densely populated areas shall be avoided. ▪ Concrete plants to be controlled in line with statutory requirements and shall not be close to sensitive receptors. ▪ Stack height of generators will be at least 3 meters above the ground. ▪ Project traffic will maintain maximum speed limit of 20 km/hr. on all unsealed roads within project area. ▪ A minimum distance of 300 meters will be ensured between batching plant(s) and the nearest community. ▪ The need for large stockpiles shall be minimized by careful planning of the supply of materials from controlled sources. Stockpiles shall not be located within 50 m of schools, hospitals or other public amenities and shall be covered with tarpaulin when not in use and at the end of the working day to enclose dust. If large stockpiles (>25m³) of crushed materials 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>are necessary, they shall be enclosed with side barriers and also covered, when not in use.</p> <ul style="list-style-type: none"> ▪ Dust emissions due to road travel shall be minimized through good construction practices (such as keeping stock piles down wind and away from communities) and sprinkling water over the access road(s). ▪ Maintaining levels of contaminant dusts, vapors and gases in the work environment at concentrations below those recommended as TWA-TLV's (threshold limit value)—concentrations to which most workers can be exposed repeatedly (8 hours/day, 40 hrs./week, week-after week), without sustaining adverse health effects. ▪ Developing and implementing work practices to minimize release of contaminants into the work environment, including: <ul style="list-style-type: none"> ▪ Direct piping of liquid and gaseous materials ▪ Minimized handling of dry powdered materials; Enclosed operations ▪ Local exhaust ventilation at emission/release points ▪ Vacuum transfer of dry material rather than mechanical or pneumatic conveyance ▪ Indoor secure storage, and sealed containers, rather than loose storage <p>Vehicular & Equipment Emissions</p> <p>It shall be ensured that the following measures are taken to control emissions from vehicles being used in the construction activity:</p> <ul style="list-style-type: none"> ▪ Periodically check and conduct maintenance of the construction machinery and haul vehicles. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
	2.2	High Noise Levels	Generators, compressors and vehicles used during construction works will be maintained in a good condition to ensure that emissions are kept to a minimum level. <ul style="list-style-type: none">▪ Regularly change the engine oil and use new engines/machinery/equipment having good efficiency and fuel burning characteristics.▪ Controlled technology generator and batching plants will be used to avoid excessive emissions.▪ Burning of wastes at any site will not be allowed.▪ The stack height of generators will be at least 3 meters above the ground.▪ Training of the technicians and operators of the construction machinery and drivers of the vehicles.▪ All type of machinery and generator must comply with the NEQS. Vehicles, which are not in compliance with NEQS are not allowed to be used.▪ Periodic emission monitoring of vehicles, generator and batching plants is proposed.▪ Project activities shall be planned to avoid harsh weather conditions.▪ Idling of vehicles will be limited to 3-5 minutes.	Contractor	CSC, PMU	DC
			Equipment noise will be reduced at source by proper design, maintenance and repair of construction machinery and equipment. Noise from vehicles and power generators will be minimized by use of proper silencers and mufflers.			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Excessive noise emitting equipment will not be allowed to operate and will be replaced. ▪ Blowing of horns will be prohibited on access roads to work sites. ▪ Manual excavation has been proposed for congested areas to reduce generation of noise. ▪ Limited use of jack hammer in populated work areas of the site. ▪ As a rule, the operation of heavy equipment shall be conducted in daylight hours. ▪ Construction equipment, which generates excessive noise, shall be enclosed or fitted with effective silencing apparatus to minimize noise. ▪ Well-maintained haulage trucks will be used with speed controls. ▪ Use of ear plug and ear muffs must be ensured during construction. No employee shall be exposed to a noise level greater than 85 dB (A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear shall be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). ▪ Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls shall be investigated and implemented, where feasible. ▪ Periodic medical hearing checks shall be performed on workers exposed to high noise levels. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Grievance redress mechanism (GRM) will be established. ▪ All the equipment and machinery used during construction phase will be well maintained and in compliance with NEQS. 			
2.3		Impacts on surface water quality of Salhad Nullah	<ul style="list-style-type: none"> ▪ PMU KPCIP will ensure that construction works are planned with a view that monsoon and winter rainfall season is avoided. ▪ The Construction Supervision Consultant (CSC) will expedite the construction works as much as possible to complete the tasks within minimum time duration. ▪ Construction debris will not be disposed off in Salhad nullah. ▪ No stockpiling of materials will be carried out near the nullah. ▪ No labor camp will be constructed at the nullah and no solid waste will be disposed off into it. ▪ The CSC will maintain good housekeeping during construction works. ▪ No slopes/excavations near the nullah will be left unattended. ▪ After construction works near the nullah, all construction material left will be picked up and the site restored to its original condition following best practices. 	Contractor	CSC, PMU	DC
	2.4	Potential Accidents and injuries to communities in project area	<ul style="list-style-type: none"> ▪ A comprehensive traffic management plan (TMP) must be developed and implemented; ▪ As part of the TMP, it will be ensured that the movement of heavy vehicles used is minimized during the peak traffic hours of the day in order to prevent congestion and accidents as far as possible; 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Furthermore, the movement of heavy vehicles within Abbottabad city while traveling to and from the project site must be restricted to specific routes containing least number of sensitive receptors and low traffic volumes. ▪ Material stock piling and parking of machinery along the roads will be avoided. Contractors will identify suitable places for material stock piling and parking of machinery. ▪ Work areas outside the project site, especially where machinery is involved, will be barricaded and will be constantly monitored to ensure that local residents, particularly children stay away from any excavated areas, which must be cordoned off. Also, no machinery will be left unattended, particularly in running condition. ▪ Local communities in the project area will be briefed on traffic safety, especially women who are the main care providers to children. ▪ Speed limit of 20 km/hr. will be maintained by all project related vehicles and nighttime driving of project vehicles will be limited where possible. ▪ Educate drivers on safe driving practices to minimize accidents and to prevent spill of hazardous substances and other construction materials during transport. ▪ Contractor must take proper safety measures (placing warning tapes around excavations) to avoid people, especially children, accidentally falling into excavations. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ All the working platforms must be cordon off with special care by well-trained skilled workers. ▪ Contractor will prepare construction management plan which will include the hazard prevention and safety plan, which will address health and safety of the people in the project area. ▪ PMU KPCIP shall ensure the contractor staff working in the project are well trained and educated in the Health, Safety and Environment (HSE) hazards associated with their duties, and that of the public, in the project area. 			
2.5	Occupational Health and Safety (OHS)		<p>General</p> <ul style="list-style-type: none"> ▪ The Contractor will be required to prepare and implement an effective OHS Plan that is supported by trained first aid personnel and emergency response facilities. Construction contracts will include standard OHS measures and contractors will be bound to implement these fully. ▪ Monitoring will be required to ensure that the OHS plan based on contract specifications is followed. ▪ Cement feed hopper areas will be inspected daily to ensure compliance with the requirement of dust masks. ▪ Surfaces (including flooring and work surfaces) in camps, kitchens, dining areas and workshops shall be solid and easy to clean. Flooring for work camps must be float finished concrete or better. 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility		
				Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ All drivers engaged by Contractors must hold a valid license for the vehicle they are operating. ▪ Work in confined space shall be executed with available safety standards. Adequate monitoring and equipment shall be available to detect deficient oxygen levels. ▪ The Contractor shall submit to the Engineer of CSC for approval an emergency evacuation plan and practice the procedure annually. ▪ The Contractor shall submit to the Engineer of CSC for approval a site layout plan, identifying work areas, accommodation, kitchen, dining area, sanitary facilities, location of generators, plant and vehicle parking, transport routes through the camp, pedestrian routes through the camp, evacuation routes, emergency exits, batching plants, storage areas, waste facilities etc. ▪ Fire extinguishers shall be provided throughout camps and work sites. Fire extinguishers shall be inspected monthly and maintained as necessary. ▪ An adequate and reliable supply of safe drinking water shall be made available at readily accessible and suitable places including at all camps. ▪ The Contractor shall take samples from each supply of drinking water and arrange for analysis of these samples at EPA certified laboratory prior to its use by the Contractor's staff. The results of these tests for each supply must be submitted to the Engineer of CSC and must demonstrate that each water supply 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>meets national and World Health Organisation standards for drinking water.</p> <ul style="list-style-type: none"> ▪ The Contractor shall provide and maintain adequate hygienic kitchens which are sheltered and separated from the living quarters. Kitchens shall include raised and washable surfaces suitable for food preparation. ▪ The Contractor shall provide and maintain adequate hygienic dining areas for staff. Work places and camps shall be provided with both natural& artificial light. Artificial lighting shall be powered by generator in the event of power cuts. ▪ Public sensitization training shall be provided to workers to avoid social conflicts between residents and the construction contractor, Occurrence of any such impacts can be avoided by community sensitive project planning and implementation and through effective involvement of local administration. ▪ All HSE protocols shall be implemented in true letter and spirit. ▪ Contractor must appoint an HSE resource to implement, monitor and report the HSE management plan to concerned authorities. ▪ Contractor must ensure the provision of first aid facility at construction site and camps through hiring medics and establishing a dispensary at the campsite. ▪ Reasonable number of first aid kits shall be available on construction sites and within contractor camps. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Based on the type of hazard applicable during the proposed works at site, the following mitigation measures as per IFC guidelines for Occupational Health and Safety (OH&S) must be implemented:²⁰ <p>Mitigation Measures for Physical Hazards</p> <ul style="list-style-type: none"> ▪ Rotating and Moving Equipment ▪ Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. ▪ Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment shall be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards shall be designed and installed in conformance with appropriate machine safety standards. ▪ Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance. ▪ Designing and installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms. <p>Vibration</p>			

²⁰ <https://www.ifc.org/wps/wcm/connect/1d19c1ab-3ef8-42d4-bd6bc79648af3fe/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES&CVID=ls62x8l>

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, shall be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure. Limits for vibration and action values. Exposure levels shall be checked on the basis of daily exposure time and data provided by equipment manufacturers. <p>Electrical</p> <ul style="list-style-type: none"> ▪ Marking all energized electrical devices and lines with warning signs; ▪ Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance; ▪ Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools; ▪ Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits; ▪ Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas; . 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Conducting detailed examination and marking of all buried electrical wiring prior to any excavation work. ▪ Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited; <p>Eye Hazards</p> <ul style="list-style-type: none"> ▪ Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Specific Safe Operating Procedures (SOPs) may be required for use of sanding and grinding tools and/or when working around liquid chemicals. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice. Machine and equipment guarding shall conform to standards published by organizations such as CSA, ANSI and ISO. <p>Welding/Hot Work</p> <ul style="list-style-type: none"> ▪ Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required. ▪ Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) shall be implemented if 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>welding or hot cutting is undertaken outside established welding work stations, including 'Hot Work Permits, stand-by fire extinguishers, stand-by fire watch, and maintaining the fire watch for up to one hour after welding or hot cutting has terminated. Special procedures are required for hot work on tanks or vessels that have contained flammable materials.</p> <p>Industrial Vehicle Driving and Site Traffic</p> <ul style="list-style-type: none"> ▪ Training and licensing industrial vehicle operators in the safe operation of specialized vehicles such as forklifts, including safe loading/unloading, load limits. ▪ Ensuring drivers undergo medical surveillance. ▪ Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms. ▪ Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures (e.g. prohibiting operation of forklifts with forks in down position), and control of traffic patterns or direction. ▪ Restricting the circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one-way' circulation, where appropriate. ▪ Ergonomics, Repetitive Motion, Manual Handling ▪ Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds. ▪ Selecting and designing tools that reduce force requirements and holding times and improve postures. ▪ Providing user adjustable workstations. ▪ Incorporating rest and stretch breaks into work processes and conducting job rotation. ▪ Implementing quality control and maintenance programs that reduce unnecessary forces and exertions. ▪ Taking into consideration additional special conditions such as left-handed persons. ▪ Working at Heights ▪ Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area. ▪ Proper use of ladders and scaffolds by trained employees. ▪ Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines. ▪ Appropriate training in use, serviceability, and integrity of the necessary PPE. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall. <p>Fire and Explosions</p> <ul style="list-style-type: none"> ▪ Storing flammables away from ignition sources and oxidizing materials. Further, flammables storage area shall be: ▪ Remote from entry and exit points into camps ▪ Away from facility ventilation intakes or vents ▪ Have natural or passive floor and ceiling level ventilation and explosion venting ▪ Use spark-proof fixtures ▪ Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to withstand flame impingement for a moderate period of time. ▪ Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment).- ▪ Providing specific worker training in handling of flammable materials, and in fire prevention or suppression. ▪ Corrosive, oxidizing, and reactive chemicals ▪ Corrosive, oxidizing and reactive chemicals shall be segregated from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water based, etc.), stored in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Workers who are required to handle corrosive, oxidizing, or reactive chemicals shall be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc.). ▪ Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, qualified first-aid shall be ensured at all times. Appropriately equipped first-aid stations shall be easily accessible throughout the place of work, and eye-wash stations and/or emergency showers shall be provided close to all workstations where the recommended first-aid response is immediate flushing with water. <p>Mitigations for Biological Hazards</p> <ul style="list-style-type: none"> ▪ The Contractor shall review and assess known and suspected presence of biological agents at the place of work and implement appropriate safety measures, monitoring, training, and training verification programs. ▪ Project contractor must provide good working and sanitation conditions at camp and wok sites. Disease surveillance shall be carried out to identify any exposure to parasites, such as hookworm, ascaris, and various mites, chiggers, ticks and dengue. ▪ Measures to eliminate and control hazards from known and suspected biological agents at the place of work shall be designed, implemented and maintained in close co-operation with the local health authorities and 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			according to recognized international standards.			
	2.6	Hazardous and non-hazardous waste management	<ul style="list-style-type: none"> ▪ A waste management plan will be developed prior to the start of construction. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the project sites for waste collection and an onsite hazardous waste storage facility i.e. designated area with secondary containment. ▪ Licensed waste contractors will be engaged to dispose off all non-hazardous waste material that cannot be recycled or reused. ▪ Excavated material from trenches will be stored at site and it will be used as fill/cover material after laying of the leachate and landfill gas pipelines, while access spoil shall be transported to spoil disposal site, if required. ▪ Excavated material generated during construction of the park components will be used as a fill material within the project site and any excess spoil shall be transported to the spoil disposal site, if required. ▪ All types of combustible and non-combustible waste, including plastic or glass bottles and cans will be temporarily stored on site and later sold/handed over to a waste/recycling Contractor, who will utilize these wastes for recycling purposes. ▪ Waste management training for all site staff will be included in Contractor's training plan. ▪ Fuel storage areas and generators will have 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored.</p> <ul style="list-style-type: none"> ▪ Fuel and hazardous material storage points will be included in camp layout plan to be submitted for approval. Hazardous material storage areas shall include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all such leaks will be plugged immediately. ▪ Designated vehicles/plant wash down and refueling points shall be included in camp layout plan to be submitted for approval. ▪ Hazardous waste will be initially stored on site at designated areas and then handed over to EPA certified contractor for final disposal. ▪ Record of waste generation and transfer shall be maintained by project Contractors. ▪ Spill kits, including sand buckets (or other absorbent material) and shovels will be provided. ▪ At the time of restoration, septic tanks will be dismantled and backfilled with at least 1m of soil cover keeping in view landscape of surrounding natural surface. ▪ It will be ensured that after restoration activities, the campsite is clean and that no refuse has been left behind. ▪ Any clinical waste will be temporarily stored onsite separately and will be handed over to approve waste contractor for final disposal. 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility		Timing
				Execution	Monitoring	
			<ul style="list-style-type: none"> ▪ Training will be provided to personnel for identification, segregation and management of waste. ▪ The structure of a Framework waste management plan has been prepared for the project and attached as Annexure M and Contractors will be required to prepare waste management plan for the site in light of guidelines provided in the waste management plan and submit to PMU for approval. 			
	2.7	Camp and Batching plant effluent	<ul style="list-style-type: none"> ▪ It will be ensured that no untreated effluent is released to the environment. ▪ A closed sewage treatment system including soak pits and septic tank will be constructed to treat the effluent from the construction/labor camps. ▪ Sewage treatment system will be installed at each respective labor camp based on the number of laborers residing at the respective camp. ▪ Wastewater from laundry, kitchen washings and showers will be disposed-off into soak pits or septic tank (where soak pit cannot be constructed) and after treatment it will disposed of in TMA provided drains in the project area. ▪ Soak pits will be built in absorbent soil and shall be located 300 m away from a water well, hand pump or surface water body. Soak pits in non-absorbent soil will not be constructed. ▪ Ensure that the soak pits remain covered all 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>the time and measures are taken to prevent entry of rainwater into them.</p> <ul style="list-style-type: none"> ▪ Sprinkling of grey water or sewage will not be allowed; in case the septic tank gets filled with sludge, septic tank shall be emptied through vacuum truck and material shall be transferred to treatment facility or approved municipal drain. ▪ Water being released from any batching plant(s) must be treated as per requirements of NEQS prior to release to sewerage system/any other water body. ▪ Sewage at the end of construction period to be disposed of in nearest municipal drains after getting approval from concerned municipal authorities 			
	2.8	Soil Contamination	<ul style="list-style-type: none"> ▪ It will be ensured that spill prevention trays are provided and used during refueling. Also, on-site maintenance of construction vehicles and equipment will be avoided as far as possible. In case on-site maintenance is unavoidable, tarpaulin or other impermeable material will be spread on the ground to prevent contamination of soil. ▪ Regular inspections will be carried out to detect leakages in construction vehicles and equipment and all vehicles will be washed in external commercial facilities. ▪ Fuels, lubricants and chemicals will be stored in covered bounded areas, underlain with impervious lining. Appropriate arrangements, including shovels, plastic bags and absorbent materials will be available near fuel and oil 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Monitoring	Timing
			storage areas.			
	2.9	Employment Conflicts	<ul style="list-style-type: none"> ▪ The Construction Contractor will adopt a transparent hiring policy. Prior to the commencement of the construction activity, the local communities in the project area will be informed of the employment policy in place and number of people that can be employed for this project. ▪ It will be ensured that maximum number of unskilled and semi-skilled jobs will be provided to the residents of the project area. ▪ The PMU will ensure a balanced process of employment of the communities in the project area with preference given to those most directly affected by the project. 	Contractor	CSC, PMU	DC
	2.10	Communicable diseases incl. COVID-19	<ul style="list-style-type: none"> ▪ A communicable diseases prevention program will be prepared for construction workers or residents near the construction sites. <p>COVID-19 specific measures</p> <ul style="list-style-type: none"> ▪ All workers must perform complete sanitization at the site as per SOPs/guidelines issued by WHO. ▪ All workers must wear a mask as soon as they arrive at site and must keep wearing it at all times while present at the work site/hospital premises. ▪ As soon as workers arrive at work site, their body temperature must be checked and in case any worker is assessed to be running a fever or suffering from a flu or cough, he must be informed to leave immediately and self-isolate for a two-week period and not report 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>for work until this two-week mandatory period has been completed.</p> <ul style="list-style-type: none"> ▪ At the work site(s), social distancing measures must be strictly implemented and gathering of workers at any location at the work site(s) must be strictly forbidden. In case of workers not taking this measure seriously, strict penalties must be imposed to ensure implementation. ▪ The work tasks must be divided into shifts, as far as possible, to reduce the workforce present at the work site(s) at any one moment and improve the working speed/efficiency. ▪ All workers will be strictly advised to wash their hands as frequently as practicable and not to touch their face during work. ▪ A supply of safe drinking water will be made available and maintained at the project site(s). ▪ COVID awareness sign boards must be installed at the clinic premises and at the work site(s). ▪ Contact details of all workers will be kept in a register on site in order to efficiently trace and manage any possible workers that might experience symptoms of COVID-19. ▪ Prohibition of entry for local community/any unauthorized persons at work sites. ▪ Proper hygiene practices in the toilets and washrooms will be implemented with proper and adequate use of soaps and disinfectant spray. ▪ Social distancing must be maintained during the pick-up and dropping off of workers from 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>their residences to and from the work site(s).</p> <ul style="list-style-type: none"> ▪ All indoor areas will be well ventilated. <p><i>COVID-19 specific measures GOP Advice for Site Managers:</i></p> <ul style="list-style-type: none"> ▪ Every construction project shall make proper arrangements for uninterrupted building services including but not restricted to, electricity, fuel, water supply, water disposal and sanitation, communication links, washrooms with hand hygiene and shower facility and with proper and adequate supply of soaps and disinfectants. ▪ Workers shall not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site. ▪ Ensure the availability of the thermal gun at the entry and exit of the construction site and no worker shall be allowed without getting his/her temperature checked. ▪ Site manager must maintain a register of all contact details with NID number and addresses of all present at the site in case a follow up or tracing and tracking of contacts is required at a later stage. ▪ Develop the employee roster to decrease the number of people on the site very day. Split the shifts of the workers in morning and evening with limit of each shift to 8 working hours. ▪ Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>end.</p> <ul style="list-style-type: none"> ▪ In addition to all other internationally recognized safety precaution for construction workers and other staff, every individual must be provided with a face mask. It must be ensured that everyone during his or her presence at the site continues to wear the mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands. ▪ Non-essential work trainings must be postponed avoiding gathering of people. ▪ Ensure the physical distance by creating more than one route of entry and exit to the site. ▪ Instruct the workers to inform the construction manager (or authorities) if <ul style="list-style-type: none"> ▪ They develop any symptoms of cough, flu or fever. ▪ They have been exposed to someone suspected or confirmed with COVID 19. ▪ They have met someone who has a travel history of COVID 19 endemic country. They have travelled in last couple of days or plan to travel soon. ▪ All incidences of appearance of the symptoms of COVID-19 shall be immediately documented and maintained at the site and information regarding which shall be immediately communicated through e-mail or else, to the designated health facility, and the sick worker shall be transported to the health 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>facility for further advice and action. The site manager must establish a link with a nearby healthcare facility with arrangements for quick transportation of workers in case of an emergency.</p> <ul style="list-style-type: none"> ▪ Persuade the workers to inform the authorities for their safety and of other if they observe any signs and symptoms in a colleague. ▪ Do not allow any worker at the construction site who has the symptoms. ▪ Display the awareness banners about hand hygiene and physical distancing, where you can, around the work site. ▪ Everyone on the construction site must observe sneezing and coughing etiquettes. Workers shall be requested and required to wash their hands as frequently as practicable and shall also be advised not to touch their face with their hands during work. ▪ Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix. ▪ Only sanitizable dining surfaces shall be used, which must be cleaned before each service. ▪ The lunch breaks and stretch breaks of the workers must be staggered to avoid the clustering of workers. Workers must not sit at 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>less than 2 meters distance while having meals and while any other activity requiring interpersonal communications in a well ventilated area.</p> <ul style="list-style-type: none"> ▪ In the wake of current restrictions on transportation, site managers will ensure safe transport arrangements for workers, which shall not be crowded and shall have social distancing in place during the entire process from pickups till drops at destination and must be well ventilated. ▪ In case of workers sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms in a well ventilated area. ▪ A supply of safe drinking water must be made available at the project site and maintained. <p>Advice for Construction Workers:</p> <ul style="list-style-type: none"> ▪ All possible and prescribed measures shall be taken to ensure your and others health. Enter your contact details in the register maintained at the site, in case a follow up or tracing and tracking of contacts is required at a later stage. ▪ Follow hygiene practices at washrooms and shower facility with proper and adequate use of soaps and disinfectants. ▪ Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours end. ▪ In addition to all other internationally 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<p>recognized safety precaution for construction workers and other staff, every individual must use face mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands.</p> <ul style="list-style-type: none"> ▪ Workers shall wash their hands as frequently as practicable and shall not touch their face with their hands during work. ▪ Everyone on the construction site must observe sneezing and coughing etiquettes. ▪ Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix. ▪ Sick worker shall immediately inform the site manager and must get medical advice from nearby health Centre. ▪ Only sanitizable dining surfaces shall be used. ▪ Do not sit at less than 2 meters distance while having meals and while any other activity requiring interpersonal communications in a well ventilated area. ▪ Do not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site. ▪ Use safe transport arrangements which shall not be crowded and shall have social distancing in place during the entire process 			

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility		Timing
				Execution	Monitoring	
			<p>from pickups till drops at destination.</p> <ul style="list-style-type: none"> ▪ In case sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms in a well ventilated area. <p>Deliveries or Other Contractors Visiting the Site:</p> <ul style="list-style-type: none"> ▪ Non-essential visits to the construction sites shall be cancelled or postponed. ▪ Delivery workers or other contractors who need to visit the construction site must go through temperature check before entering and shall be given clear instructions for precautions to be taken while on site. ▪ Designate the workers, with protective gears or at least masks, to attend to the deliveries and contractors. ▪ Make alcohol-based hand sanitizer (at least 70%) available for the workers handling deliveries. ▪ Instruct the visiting truck drivers to remain in their vehicles and whenever possible make use of contactless methods, such as mobile phones, to communicate with your workers. ▪ All indoor areas must be well ventilated. 			
2.11	Construction of Administration Building and Other Infrastructure		<ul style="list-style-type: none"> ▪ Water will be sprinkled regularly to suppress dust emissions. Off road travelling of vehicles will be prohibited. ▪ Stock piles will be appropriately located and out of wind to avoid dust emissions. Dry dusty materials shall be sprinkled with water and properly covered to avoid dust emissions. ▪ No cement and concrete waste will be left unattended. Construction debris will not be 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility		
				Execution	Monitoring	Timing
			<p>thrown from height to avoid dust emissions. Return unpaved areas to original or improved contours following construction.</p> <ul style="list-style-type: none"> ▪ Solid waste generated from construction of admin building will be managed through site specific EMMP and no waste will be stored at site to improve housekeeping at site and to avoid environmental nuisance. ▪ Set protocols for proper and regular maintenance of construction machinery, vehicles and generators. Generators that will be used will be placed at suitable locations. ▪ Contractor will not be allowed to store bulk quantities of fuel or hazardous material at site. ▪ Any fuel or chemicals stored at site (in small quantities) will be stored at designated site and containers/storage vessels be properly marked for their contents. Storage area will be provided with hard impervious surface and secondary containment. ▪ Equipment and machinery with loose vibratory parts will not be allowed to use. Used equipment and machinery will be in compliance to NEQS. ▪ Waste bins will be provided at appropriate places to manage waste. Daily housekeeping of the construction area will be carried out. 			
	2.12	Site restoration	<ul style="list-style-type: none"> ▪ Demobilization of all equipment and machinery; ▪ Disposal of any waste material remaining at the time of completion of the operation; ▪ Backfilling of all excavation, followed by compaction; 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility Execution	Monitoring	Timing
			<ul style="list-style-type: none"> ▪ Dismantling and removal of fence or barriers surrounding the campsite area; and ▪ General restoration of the site area, including landscaping and restoration of drainage where required; ▪ PMU KPCIP, through CSC, will ensure that restoration of construction works will be carried out by Contractors; ▪ PMU KPCIP will ensure periodic monitoring of such restorations; ▪ Contractors will develop site restoration protocols and will submit to CSC/PMU for review and approval; ▪ Construction site restoration protocols will be part of bidding documents and constructions contracts; ▪ Construction Contractor will add restoration costs into the BOQ documents. 			
	2.13	Vegetation and Wildlife Loss	<ul style="list-style-type: none"> ▪ Consideration will be given to the visual appearance of the park site during operation. A considerable area has been allocated for plantation to improve landscape of the area; ▪ Off-road travel will be strictly prohibited and observance of this will be monitored during execution of the project; ▪ Vehicle speeds will be regulated and monitored to avoid excessive dust emissions; ▪ No hunting or killing of animals will be permitted; ▪ No cutting down of vegetation or using vegetation or trees as firewood will be permitted. 	Contractor	CSC, PMU	DC

Project Activities	Section	Impact	Mitigation Measures Recommended	Responsibility		
				Execution	Monitoring	Timing
	2.14	Historical/Archaeological Sites	If evidence of any archaeological remains is found during the construction activities, the excavation work will be stopped immediately, and necessary next steps taken to identify the archaeological discovery based on the 'Chance Find' procedures provided as Annexure G .	Contractor	CSC, PMU	DC
Operation Phase	3.1	Generation of solid waste	<ul style="list-style-type: none"> ▪ A waste management plan for operation phase will be developed. This plan will cater to sorting of hazardous and non-hazardous materials prior to disposal, placing of waste bins at the park premises for waste disposal. ▪ Licensed waste contractors will be engaged to dispose off all non-hazardous waste material that cannot be recycled or reused. ▪ All types of combustible and non-combustible waste including plastic or glass bottles and cans will be temporarily stored on site and later sold/handed over to a waste/recycling Contractor, who will utilize this waste for recycling purposes. ▪ Waste management training for all park staff will be included in the training plan. ▪ Fuel storage areas and generators (if required) will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to 120% of the total volume of fuel stored. ▪ Fuel and hazardous material storage points will be included in the layout plan to be submitted for approval. Hazardous material storage areas will include a concrete floor to prevent soil contamination in case of leaks or spills. Fuel tanks will be checked daily for leaks and all 	O&M Contractor /WSSCA	WSSCA, PMU	DO

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Responsibility Monitoring	Timing
			<p>such leaks will be plugged immediately.</p> <ul style="list-style-type: none"> ▪ Designated drains for vehicles wash down shall be constructed and layout plan to be submitted for approval. ▪ Any hazardous waste generated at the park premises will be initially stored on site at designated area and then handed over to EPA certified Contractor for final disposal. ▪ Record of waste generation and transfer shall be maintained by project Contractor(s). ▪ Training will be provided to personnel for identification, segregation and management of waste. ▪ The structure of a Framework waste management plan has been prepared for the project and attached as Annexure M. ▪ WSSC Abbottabad will be required to prepare waste management plan for the site in light of guidelines provided in the waste management plan and submit to PMU for approval. 			
	3.2	Surface water quality of Salhad Nullah	Water quality of Salhad Nullah will be monitored to ensure it is not being contaminated due to the park operation.	O&M Contractor /WSSCA	WSSCA, PMU	DO
	3.3	Septic tank effluent disposal from washroom toilets	<ul style="list-style-type: none"> ▪ The septage from the septic tank will be disposed off in accordance with established SOPs that will be strictly implemented to ensure the septic tank is well maintained and is emptied at a regular frequency before it reaches full capacity. ▪ The septage will be transported in accordance with international good practices and will be disposed off at a location pre-approved by WSSCA, such as the nearest sewage 	O&M Contractor /WSSCA	WSSCA, PMU	DO

Project Activities	Section	Impact	Mitigation Measures Recommended	Execution	Monitoring	Timing
			treatment plant.			
	3.4	Leachate collection and management system and methane gas collection and ventilation system	<ul style="list-style-type: none"> ▪ Regular preventive maintenance checks will be conducted to ensure any leakages and/or pipe bursts are immediately identified and necessary corrective steps are taken. ▪ In case of any contamination due to leakage of leachate from the pond or pipeline from the site to the pond, a detailed remedial plan shall be developed and will be in place to control the contamination of both groundwater and surface water. ▪ Public will not be allowed to access the leachate storage pond and methane gas collection area. ▪ Emergency response plan, provided as Annexure F, shall be implemented in case of a leak or explosion at the park facility. 	O&M Contractor /WSSCA	WSSCA, PMU	DO

CSC	Construction Supervision Consultant
BC	Before Construction
DC	During Construction
PMU	Project Management Unit
DO	During Operation

Table 7.2: 'Pre-Construction' Environmental Monitoring Plan for Baseline Development

Parameter to be measured	Objective of Monitoring	Parameters to be Monitored	Measurements	Location	Frequency	Responsibility
Surface Water Quality	To establish baseline of surface water quality (Salhad Nullah)	NEQS/WHO Standards	Water samples for comparison against NEQS parameters	At two locations, Upstream and downstream of the nullah	Once	CSC
Ambient Air Quality	To establish baseline air quality levels	CO, NO ₂ & PM ₁₀ (particulate matter smaller than 10 microns) concentration at receptor level	1-hr and 24-hr concentration levels	At three random receptor locations in the project area , both upwind and downwind	Once	CSC
Ambient Noise	To establish baseline noise levels	Ambient noise level near receptors in project area	A-weighted noise levels – 24 hours, readings taken at 15 s intervals over 15 min. every hour, and then averaged	At three random receptor locations in the project area	Once	CSC
Groundwater Quality in vicinity of project area	To establish groundwater quality in project area	Groundwater quality in project area	Water samples for comparison against NEQS parameters	At two locations around the site in the project area	Once	CSC

Table 7.3: Construction Phase Monitoring Requirements

Project Activity and Potential Impact	Objective of Monitoring	Parameters to be Monitored	Measurements	Location	Frequency	Responsibility
Noise Disturbance due to noise from construction activity	To determine the effectiveness of noise abatement measures on sound pressure levels	Ambient noise level at different locations in project area	A-weighted noise levels – 24 hours, readings taken at 15 s intervals over 15 min. every hour at 15 m from receptors, and then averaged	At three random receptor locations in project area	Quarterly basis on a typical working day	Contractor's Environmental officer, CSC
Air Quality Dust emissions from construction vehicles and equipment	To determine the effectiveness of dust control program on dust at receptor level	CO, NO ₂ & PM ₁₀ (particulate matter smaller than 10 microns) concentration at receptor level	1-hr and 24-hr concentration levels	At three random receptor locations in project area	Quarterly basis on a typical working day	Contractor's Environmental officer, CSC
		Visible dust	Visual observation of size of dust clouds, their dispersion and the direction of dispersion	Construction site	Once daily during peak construction period	Contractor's Environmental officer, CSC
Surface Water Quality of Salhad Nullah	To determine the effectiveness of mitigation measures	As per WHO/NEQS	Water samples for comparison against NEQS parameters	At two locations, Upstream and downstream of the nullah	Quarterly basis on a typical working day	Contractor's Environmental officer, CSC

Project Activity and Potential Impact	Objective of Monitoring	Parameters to be Monitored	Measurements	Location	Frequency	Responsibility
Groundwater Quality in vicinity of project area	To determine potential contamination of groundwater quality in project area	Groundwater quality in project area	Water samples for comparison against NEQS parameters	At two locations around the site in the project area	Quarterly basis on a typical working day	CSC
Safety precautions by Safety workers	To prevent accidents for workers and general public	Number of near miss events and accidents taking place	Visual inspections	Construction site	Once Daily	Contractor's Environmental officer, CSC
Soil Contamination	To prevent contamination of soil from oil and toxic chemical spills and leakages	Incidents of oil and toxic chemical spills	Visual inspections	At construction site and at vehicle and machinery refuelling & maintenance areas	Once a month	Contractor's Environmental officer, CSC
Solid Waste & Effluent disposal Insufficient procedures for waste collection, storage, transportation and disposal	To check the availability of waste management system and implementation	Inspection of solid and liquid effluent generation, collection, segregation, storage, recycling and disposal will be undertaken at all work sites in project area	Visual inspections	At work sites in project area	Once daily	Contractor's Environmental officer, CSC

Table 7.4: Operation Phase Environmental Monitoring Plan

Parameter to be measured	Objective of Monitoring	Parameters to be Monitored	Measurements	Location	Frequency	Responsibility
Surface Water Quality	To determine the effectiveness of mitigation measures	As per WHO/NEQS	Water samples for comparison against NEQS parameters	At two locations, Upstream and downstream of the nullah	Bi-annual basis on a typical working day	WSSC Abbotabad
Solid Waste Management Plan	To assess that solid waste generated from park operation is managed as per IEE/EMP requirements	Solid waste inventory is being maintained	Solid waste inventory audit	Salhad Park premises	Monthly	WSSC Abbotabad

Table 7.5: Capacity Development and Training Programme*

Provided by	Organized by	Contents	Target Audience	Venue	Duration
Pre-construction Phase PMC offering specialized services in environmental management and monitoring	CSC & PMU	Short seminars and courses on: Environmental Management Plan and Environmental Monitoring Plan Group exercise and participatory workshop to measure effectiveness of program	Contractor staff	WSSC Office, Abbottabad	One day long training seminar including group exercise/workshop
Construction Phase PMC offering specialized services in social management and monitoring	CSC & PMU	Short seminar on Environmental risks associated with construction phase. Development of Environmental Performance Indicators Occupational Health and Safety (OHS) issues Group exercise and participatory workshop to measure effectiveness of program	Contractor staff	WSSC Office, Abbottabad	One day long training seminar including group exercise/workshop
Operation Phase Park Operator authorized representative or 3 rd party trainer	WSSCA & PMU	Short seminars on Environmental risks associated with operation phase. Development of Environmental Performance Indicators/ Occupational Health and Safety (OHS) issues	O&M contractor	Park premises	One day long training seminar including group exercise/workshop

* These capacity development programs will be made participatory to the extent possible so it is more effective, with a large amount of learning by doing, role playing, group exercise, etc..

Assessments will also be conducted at the end of each training program to measure the effectiveness of the program, which will give more assurance that project activities will run smoothly.

7.9 Environmental Management Costs

321. The **Table 7.6** below provides cost estimates for 'Pre-Construction phase' monitoring while **Tables 7.7** and **7.8** provides cost estimates for 'Construction phase' and 'Operation phase' monitoring of key environmental parameters.
322. The costs associated with implementation of the EMP and the necessary mitigation measures are provided as **Table 7.9** below. The **Table 7.10** below provides the cost for capacity development and training programme for project contractors for the proposed park development.

Table 7.6: Annual Cost Estimates for 'Pre-Construction Phase' Environmental Monitoring²¹

Monitoring Component	Parameters	Quantity	Amount PKR	Details
Surface water Quality	NEQS/WHO	4 (once only at 2 locations)	120,000	4 readings @ PKR 30,000 per sample
Air Quality	CO, NO ₂ , SO ₂ , O ₃ PM ₁₀	3 (Once only at 3 locations)	90,000	3 readings @ PKR 30,000 per sample
Noise Levels	dB(A)	3 (Once only at 3 locations)	90,000	3 readings @ PKR 30,000 per reading
Ground Water Quality	NEQS	2 (Once only at 2 locations)	60,000	2 readings @ PKR 30,000 per sample
Contingencies			18,000	5% of monitoring cost
Total (PKR)			378,000	

²¹ For air quality monitoring: 'Passive samplers' such as test tubes can be used or 'Active samplers' with sorbent turbines can also be used.

For noise monitoring: sampling equipment with duration greater than 1 hour can be used.

Table 7.7: Annual Cost Estimates for ‘Construction Phase’ Environmental Monitoring²²

Monitoring Component	Parameters	Quantity	Amount PKR	Details
Surface Water Quality	NEQS/WHO	8 (Quarterly at 2 locations)	240,000	8 readings @ PKR 30,000 per sample
Air Quality	CO, NO ₂ , PM ₁₀	12 (Quarterly at 3 locations)	360,000	12 readings @ PKR 30,000 per sample
Noise Levels	dB(A)	12 (Quarterly basis at 3 locations)	360,000	12 readings @ PKR 30,000 per reading
Groundwater Quality	NEQS/WHO	8 (Quarterly at 2 locations)	240,000	8 readings @ PKR 30,000 per sample
Contingencies			60,000	5% of monitoring cost
Total (PKR)			1,260,000	

Table 7.8: Annual Cost Estimates for ‘Operation Phase’ Environmental Monitoring²³

Monitoring Component	Parameters	Quantity	Amount PKR	Details
Surface Water Quality	NEQS/WHO	4 (bi-annual only at 2 locations)	120,000	4 readings @ PKR 30,000 per sample
Contingencies			6000	5% of monitoring cost
Total (PKR)			126,000	

Table 7.9: Estimated Costs for EMP Implementation

Item	Sub-Item	Estimated Total Cost (PKR)
Staff, audit and monitoring cost¹	1 person for 24 months (@ 100,000 per month)	2,400,000
Monitoring Activities	Provided separately in Tables 7.6, 7.7 and 7.8.	-
Mitigation Measures	As prescribed under EMP and IEE.	31,500,000
(i) Site Remediation	To remediate site prior to park development (based on initial estimates)	30,000,000
(ii) Water sprinkling	To suppress dust emissions	800,000
(iii) Solid waste collection & disposal	From construction sites (based on initial estimates)	700,000
Contingencies	5% of EMP implementation cost	1,695,000
Total Estimated Cost (PKR)		35,595,000

¹: To cover staff cost and expenses of Environmental Specialist for Contractor

Table 7.10: Cost of Capacity Development and Training Programme for Project Contractor(s)

Provided by	Organized by	Contents	No. of training events	Duration	Cost (PKR)
Pre-construction Phase Monitoring Consultants/Organizations offering specialized services in environmental management and monitoring	CSC PMU &	Short seminars and courses on: Environmental Management Plan and Environmental Monitoring Plan	Two seminars for Contractor management staff and project staff	1 day	100,000/Training
Construction Phase Monitoring Consultants/Organizations offering specialized services in environmental management and monitoring	CSC PMU &	Short seminars on Environmental risks associated with construction phase. Development of Environmental Performance Indicators Occupational Health and Safety (OHS) issues	Two seminars for Contractor management staff and project staff dealing in environment and social issues	1 day	100,000/Training
Operation Phase Park Operator authorized representative or 3 rd party trainer	WSSC Abbotabad	Short seminars on Environmental risks associated with operation phase. Development of Environmental Performance Indicators Occupational Health and Safety (OHS) issues	Bi-annual seminars	1-2 Day	600,000/Year
Total		800,000 (PKR 0.8 million)			

8 Public Consultation and Information Disclosure

323. This section describes the process and outcomes of the consultations carried out with various groups of stakeholders as part of the environmental and social assessment. It includes a brief discussion on the concerns expressed by the stakeholders during the consultation meetings and responses provided in order to address the concerns through necessary mitigation measures.
324. The specific objectives of the consultation were: (i) obtaining local and indigenous knowledge about the environment and people living in the project area; (ii) interaction with the project affected population and other stakeholders for the collection of primary and secondary data on environment and people; and (iii) engaging stakeholders for maximization of the project benefits.
325. The public consultation process was carried out by the KPCIP-EDCM team from start in May, 2020. Mainly key informants were consulted for these meetings which were carried out in an open and frank atmosphere conducive to appreciation of the basic elements of the project and dissemination of information on beneficial and adverse impacts and mitigation for adverse impacts.
326. Total 10 FGDs was conducted. Total 50 men and women participating in these 8 FGDs with seventeen women (34 percent) taking part in the consultative process. Information on positive and negative impacts associated with constructional and operational stage and proper mitigation of adverse impacts were shared at these consultations. Questionnaires for conducting FGDs and Surveys are attached as **Annexure B**.
327. Details on the public consultations conducted are provided as **Annexure C**.

8.1 Identification of Stakeholders

328. Stakeholders are considered to be individuals or organizations which have an interest in the proposed project or knowledge that would provide insight into issues or affect decision making related to the proposed project. On the basis of interest and role criteria there are two types of stakeholders for the proposed project as described below.

8.1.1 Primary Stakeholders

329. The primary stakeholders are primarily the Project Affected Persons (PAPs) and general public residing in the project area - for example, people living in the project area particularly those affected by the footprint of the project site. These are the people who are directly exposed to the project's impacts though in most cases they may not be receiving any direct benefit from the project.

8.1.2 Secondary Stakeholders

The secondary stakeholders are typically institutional stakeholders – for instance, related government department/agencies, local government, and organizations that may not be directly affected by the project; however, they may influence the project and its design. Various departments are involved that may have a role during various phases of the project, regulatory agencies such as EPA, other relevant departments such as Forest and Wildlife, non-governmental organizations (NGOs), etc.

8.2 Consultation Process

330. As part of the present environmental and social assessment, detailed consultations were carried out through nearest village meetings and focus group discussions (FGDs) with the communities, including women in the project area. Separate meetings were held with the institutional stakeholders in the form of one-to one meetings i.e. with EPA, WSSP, etc. Details of this consultation process are described below.
331. The consultation was carried out during the various site visits, interaction with local community, group discussion, individual discussion and all data was recorded. Specially, prepared consultation performa was used during the data collection.

8.3 Consultation with Project Affected Peoples

332. Details of stakeholder consultations are mentioned in **Table 8.1** and pictures are attached as **Figure 8.1**.

Table 8.1: Consultation with Project Affected Peoples

Name	Comments
Khursheed Ahmed Tanoli	He appreciated the project and hoped that project will increase the beautification of the area.
Alamzaib s/o Mir Muhammad	No major concern was showed by the person.
Abdul Rasheed, s/o Sultan Muhammad	He urged the project development should be in consensus with the local public.
Muhammad Saddiq s/o Faqir Muhammad	No major concern was showed by the person
Ali Zaman s/o Rhmat ullah	No major concern was showed by the person
Muhammad Masqueen s/o Gulzaman	No major concern was showed by the person
M. Sarfraz s/o Khan Muhammad	No major concern was showed by the person
M. Yaqoob s/o Abdul Ghani	He hoped that project will cause in generation of local employment.
M. Jamil s/o Khaliq Nawaz	He appreciated the project and hoped that project will uplift economic values of the local area.
Atiq –ur-Rehman, Khanud din	He appreciated the project and hoped that the project will helpful in reduction of mosquitoes and

Name	Comments
	flees in the area and smell/smoke issue will be solved due to project.
Syed Shah s/o Mubarik	He appreciated the overall project activities.
Muhammad Musqan s/o Abdul Karim	No major concern was showed by the person
M. Tariq, s/o Wali Muhammad	He appreciated the project.
Taj Muhammad s/o Gulzar	No major concern or comment was shown
Wazir Muhammad s/o Sikandar	No major concern or comment was shown
Shamsheer Feroz, s/o Feroz Ameen	No major concern or comment was shown
Muhammad Meraj,s/o Muhammad Sarwar	He showed concern about the employment in the area and government policy towards the investment priority.
M. Riaz, s/o Sultan Muhammad	No major concern was showed by the person
Qari Muhammad Amir, s/o Amir Younas	No major concern was showed by the person
Muhammad Farooq s/o Faiq Ali	No major concern was showed by the person

Figure 8-1: Photographs of Focus Group Discussions





8.4 Consultation with Official Stakeholders:

333. As part of environmental assessment, detailed meetings were held with the institutional stakeholders in the form of one-to-one meetings i.e. with EPA, WSSC Abbottabad, KP Irrigation department and District Administration etc. Details of these consultations are described below.
334. Officials of the Khyber Pakhtunkhwa Environmental Protection Agency (KP-EPA) have been consulted and briefed on the salient features of the project. Deputy Director KP-EPA Mr. Waheed stated that proper mitigation plan should be designed and then implemented

in the construction and operation phase of the project activities. Details of consultation meetings with official stakeholders are mentioned in **Table 8.2**.

335. Although the engagement is in its initial stages, at some point prior to and during construction, the KP-EPA, as well as other KP government departments are expected to be increasingly involved in the stakeholder consultation process.

Table 8.2: Findings of Consultation with Government Stakeholders

Sr. No.	Government Department / Agency	Date of Meeting	Description	Comment by Official	Pictorial View
1	Local Government Department – Abbottabad Office	April 27, 2021	No ADP scheme was available in past for waste site rehabilitation.	Overall the project is Good	
2	Forest and Wild Life Department	April 27, 2021	Under the Green Pakistan Project, the Forest and Wild Life Department is monitoring the Billion Trees Tsunami Project, the site may be helpful for the plantation.	Forest and Wild Life Department can facilitate the project in terms of development to area for game reserves / Wild life sanctuary and development of urban forest.	

Sr. No.	Government Department / Agency	Date of Meeting	Description	Comment by Official	Pictorial View
3	Irrigation Department		No irrigation channel is passing near the project site, the officials were briefed about the project and their concerns or suggestions obtained	The official, Project Director Siren River, Abbottabad, appreciated the project.	
4	Environment Protection Agency- North Directorate - Abbottabad		The Director North of EPA showed concern about the transportation of existing waste to another site as well as capping to existing waste site (if not properly capped).	Our all they showed good gesture towards the project.	
5	District Coordinating Office-Additional (ADC)	April 27, 2021	All the project schemes are governed by the District Coordinating Office either they are ADP or CSP or funded by any donor agency.	This office can greatly contribute during the execution of any project.	

Sr. No.	Government Department / Agency	Date of Meeting	Description	Comment by Official	Pictorial View
6	Pakistan Red Crescent Society	April 28, 2021	Pakistan Red Crescent Society is active in the area for mostly medical related service.	The NGO can be useful in execution regarding the medical services related with activities if required.	

8.5 Consultations with Scavengers and Scrap Dealers in Abbottabad

8.5.1 Introduction

336. This section consists of the waste scavengers, scrap collectors, dealers, and transporters operating in the city. During the environmental and socioeconomic studies of the project area, these groups were identified as important stakeholders which will be influenced in some form or another. To gather more information on the nature and extent of this influence, a data collection and analysis strategy was devised by the environmental experts, questionnaires drafted and site visits conducted. All these activities are described below.

8.5.2 Consultation Process and Findings

337. The process of consultation was planned to begin with contacting the workers collecting waste door-to-door every morning, and progressing step by step through scrap collection and sorting facilities of various capacities, possibly including the transporters associated along the way, up till the larger scrap recycling or management facilities.
338. The visits conducted by the environmental team, covering most of the aforementioned groups, yielded some useful data which projects a picture of the current operations within the informal waste management system structure. Details of their operations, income levels and their opinions, particularly concerns, are given as a summary in **Table 8.3** below.

Table 8.3: Table of Exclusive Consultation with Scavengers and Scrap Dealers

Sr. No.	Date	Location of Consultation	Total No. of Participants	Comments/Concerns
1	16/07/20	Murree Road	02	<p>(Small scale scrap dealer)</p> <p>The scrap business does generate a relatively stable income, although low, as the owner and employees have gotten accustomed to the market.</p> <p>They hope and expect facilitation in the form of better streamlined movement of waste within this informal system or any future proposed system of waste management, particularly regarding its transportation options.</p>
2	16/07/20	Murree Road	02	<p>(WSSC employees)</p> <p>The current waste management system adopted by the WSSC is not properly maintained and checked.</p> <p>More formal job opportunities in this sector can and should be provided, along with cleaner and safer working protocols.</p>

Sr. No.	Date	Location of Consultation	Total No. of Participants	Comments/Concerns
3	16/07/20	Salhad, Abbottabad	04	<p>(Intermediate scrap dealer)</p> <p>Lack of availability of sorting machines exposes these workers to many workplace hazards.</p> <p>Awareness should be provided on how to handle the waste and dispose it off further</p>
4	16/07/20	Salhad, Abbottabad	02	<p>(Intermediate scavenger/waste picker)</p> <p>For them, this is a steady source of income generation.</p> <p>Their waste sorting activity is not as labour intensive since the waste they receive has already undergone some preliminary sorting.</p> <p>They feel that their young children who should be in schools also have no option but to assist in their work to generate enough income to survive.</p>
5	16/07/20	Salhad, Abbottabad	06	<p>(Mid-size intermediate scrap dealer)</p> <p>Their operations generate a decent income.</p> <p>They still feel that a lack of regulation and streamlined processes hinders them from operating optimally.</p> <p>The recycling industry has a great potential which is still mostly untapped</p> <p>Overall they stressed that this industry has great potential for profit which is still mostly untapped.</p> <p>The waste transportation mechanism needs to be improved and made as efficient as possible</p>
6	16/07/20	Salhad, Abbottabad	15	<p>(Intermediate scrap dealer along with small waste pickers and a truck driver)</p> <p>Some lack of regulation and supervision exist. If properly addressed, this will certainly make this industry safer, more efficient and more lucrative to work in.</p> <p>These workers were satisfied with their job as the dumping waste was situated nearby their shop.</p>

8.6 Consultation Plan for Construction and Operation Phase

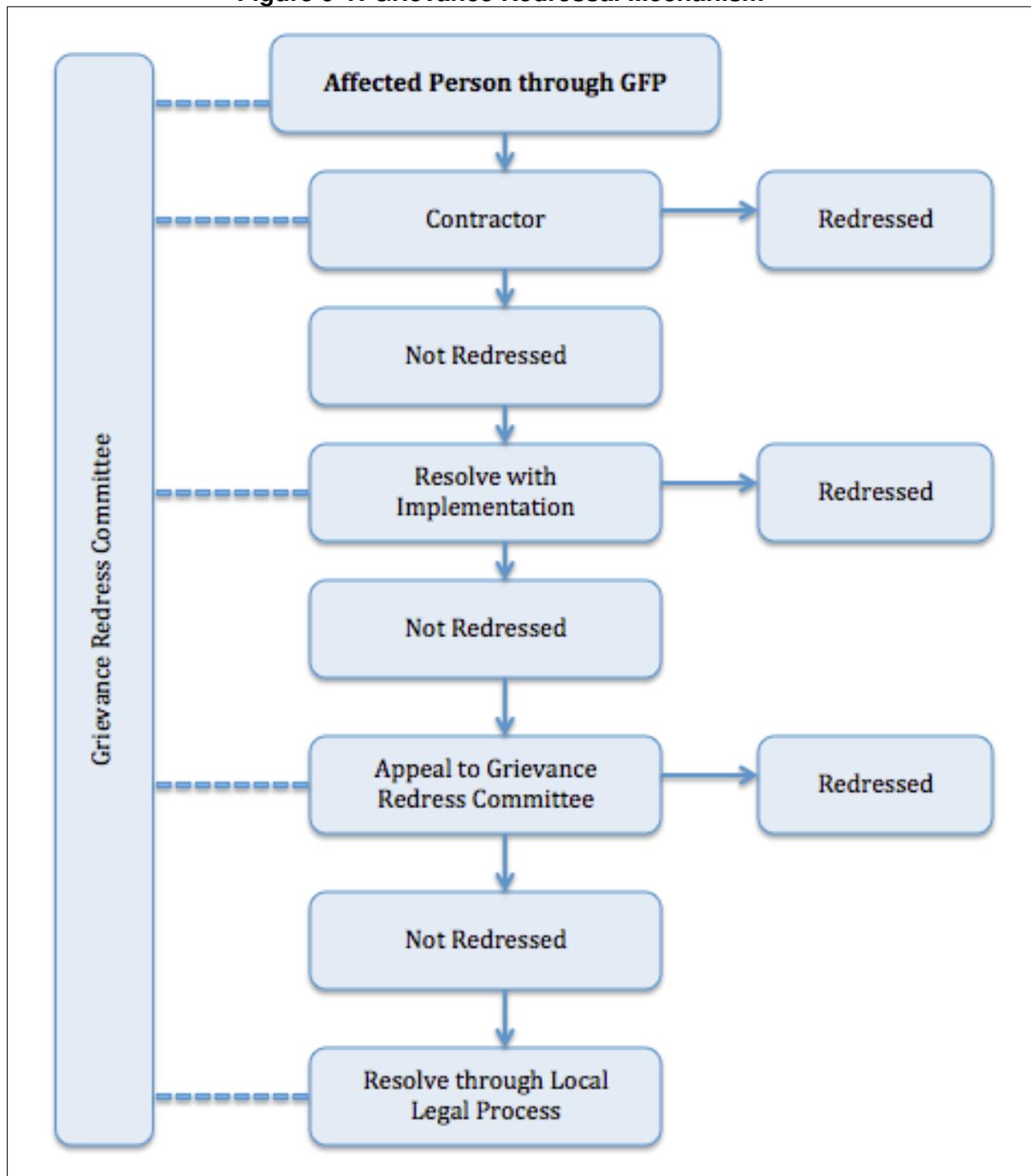
339. Consultation plan for construction and operation phase of the park development will be prepared in order to obtain responses from the project stakeholders and general public about the project. Periodic consultations and community feedback surveys will be carried out to develop positive perception about the project. Intended stakeholders for such consultations will be all stakeholders that are consulted at the time of IEE preparation and KPCIP PRF processing. Record of such consultations will be maintained at PMU/WSSCA offices and necessary changes in operational modalities will be introduced in the system in light of the response provided by the consultants.
340. Furthermore, consultations will be conducted with existing waste pickers before the dumping ceases and site clearing is done and an assessment will be conducted of their lost income, if any, to assess their eligibility for any compensation payable to them.

9 Grievance Redressal Mechanism

9.1 General

341. The ADB Policy (SPS 2009) requires establishment of a local grievance redress mechanism to receive and facilitate resolution of the Displaced/Affected Persons concerns and grievances regarding the project's social and environment performance. The measures have been identified to mitigate any potential environmental and social impacts to be caused due to implementation of proposed park development.
342. However, in spite of best efforts, there is chance that the individuals / households affected by the project or other stakeholders are dissatisfied with measures adopted to address adverse social impacts of the project. To address, such situation an effective Grievance Redress Mechanism (GRM) will be established to ensure timely and successful implementation of the project. It will also provide a public forum to the aggrieved to raise their objections and the GRM would address such issues adequately. It will receive, evaluate and facilitate the resolution of displaced persons' concerns, complaints and grievances about the social and environmental performance at the level of the project.
343. The GRM will aim to investigate charges of irregularities and complaints receive from any displaced persons and provide a time-bound early, transparent and fair resolution to voice and resolve social and environmental concerns link to the project.
344. The PMU KPCIP shall make the public aware of the GRM through public awareness campaigns. The name of contact person(s) and his/her phone number, PMU contact numbers will serve as a hotline for complaints and shall be publicized through the media and placed on notice boards outside their offices, construction camps of contractors, and at accessible and visible locations in the project area. The project information brochure will include information on the GRM and shall be widely disseminated throughout the project area. Grievances can be filed in writing, via web-based provision or by phone with any member of the PMU.
345. **First tier of GRM.** The PMU is the first tier of GRM which offers the fastest and most accessible mechanism for resolution of grievances. The PMU staff for environment and social safeguards will be designated as the key officers for grievance redressal. Resolution of complaints will be completed within seven (7) working days. Investigation of grievances will involve site visits and consultations with relevant parties (e.g., affected persons, contractors, traffic police, etc.). Grievances will be documented and personal details (name, address, date of complaint, etc.) will be included, unless anonymity is requested. A tracking number will be assigned for each grievance, including the following elements:
- Initial grievance sheet (including the description of the grievance), with an acknowledgement of receipt handed back to the complainant when the complaint is registered;
 - Grievance monitoring sheet, mentioning actions taken (investigation, corrective measures);
 - Closure sheet, one copy of which will be handed to the complainant after he/she has agreed to the resolution and signed-off.

- The updated register of grievances and complaints will be available to the public at the PMU office, construction sites and other key public offices in the project area. Should the grievance remain unresolved, it will be escalated to the second tier.
346. **Second Tier of GRM.** The PMU will activate the second tier of GRM by referring the unresolved issue (with written documentation) to the Water Sanitation and Services Company (WSSC), Abbottabad who will pass unresolved complaints upward to the Grievance Redress Committee (GRC). The GRC will be established by WSSC Abbottabad before start of site works. The GRC will consist of the following persons: (i) Project Director; (ii) representative of District government; (iii) representative of the affected person(s); (iv) representative of the local Deputy Commissioners office (land); and (v) representative of the KP EPA (for environmental-related grievances). A hearing will be called with the GRC, if necessary, where the affected person can present his/her concerns/issues. The process will facilitate resolution through mediation. The local GRC will meet as necessary when there are grievances to be addressed. The local GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within fifteen (15) working days. The contractor will have observer status on the committee. If unsatisfied with the decision, the existence of the GRC will not impede the complainant's access to the Government's judicial or administrative remedies.
347. The functions of the local GRC are as follows: (i) resolve problems and provide support to affected persons arising from various environmental issues and including dust, noise, utilities, power and water supply, waste disposal, traffic interference and public safety as well as social issues and land acquisition (temporary or permanent); asset acquisition; and eligibility for entitlements, compensation and assistance; (ii) reconfirm grievances of displaced persons, categorize and prioritize them and aim to provide solutions within a month; and (iii) report to the aggrieved parties about developments regarding their grievances and decisions of the GRC.
348. The WSSC Abbottabad officers will be responsible for processing and placing all papers before the GRC, maintaining a database of complaints, recording decisions, issuing minutes of the meetings and monitoring to see that formal orders are issued and the decisions carried out.
349. **Third tier of GRM.** In the event that a grievance cannot be resolved directly by the PMU (first tier) or GRC (second tier), the affected person can seek alternative redressal through the district or sub-district committees as appropriate. The PMU or GRC will be kept informed by the district, municipal or national authority. The grievance redress mechanism and procedure are depicted in the **Figure 9.1** below. The monitoring reports of the EMP and RP implementation will include the following aspects pertaining to progress on grievances: (i) Number of cases registered with the GRC, level of jurisdiction (first, second and third tiers), number of hearings held, decisions made, and the status of pending cases; and (ii) lists of cases in process and already decided upon may be prepared with details such as Name, ID with unique serial number, date of notice, date of application, date of hearing, decisions, remarks, actions taken to resolve issues, and status of grievance (i.e., open, closed, pending).
350. In order to provide greater clarity, the pictorial description of the GRM is provided in **Figure 9.1** below.

Figure 9-1: Grievance Redressal Mechanism

10 Conclusion and Recommendations

- 351. The proposed development of Salhad Park in Abbottabad is of high significance considering the urgent need for improving the aesthetics of this area by converting this existing site from a dumping ground to a recreational facility where the residents of the neighboring areas can visit and enjoy the facilities that will be developed. Furthermore, the aesthetics and public health aspects of this project area will greatly improve once the land has been rehabilitated and the park has been developed while a very positive impact on the Salhad Nullah is also expected in the long term as a result of the development of the park and remediation of this site.
- 352. Primary and secondary data has been collected and used to assess the environmental impacts of the Project. This IEE report highlights all potential environmental impacts associated with the project and recommends mitigation measures. Any environmental impacts associated with the project need to be properly mitigated, through the existing institutional arrangements described in this report.
- 353. The majority of the environmental impacts are associated with the construction phase, such as traffic congestion and community health and safety issues during the land remediation and development of the park infrastructure.
- 354. The implementation of mitigation measures during construction period will be the responsibility of the Contractor. Therefore, the required environmental mitigation measures will have to be clearly defined in the bidding and contract documents, and appropriately qualified environmental staff retained by the Consultant to supervise the implementation process. The EMP includes measures to minimize project impacts due to traffic, noise, air pollution, waste generation etc.
- 355. The EMP contained within this IEE document is considered sufficient for issuance as part of the Contracts to the successful bidder(s) and for subsequent use during the project works. It should be mentioned that prior to the commencement of works, this EMP must be further updated by the Contractor into site specific EMPs (SSEMPs) for review and approval of ADB. In these SSEMPs, aspects such as a detailed traffic management plan, identification of locations for disposal of debris and spoil and any other details which shall become available later must be included for efficient implementation of all proposed mitigation measures and the subsequent monitoring of these measures.
- 356. Based on the above, this report concludes that there are no potential adverse environmental impacts from the proposed park development. Impacts of less significance can be mitigated to an acceptable level by adequate implementation of the mitigation measures identified and suggested, hence, no significant or unacceptable change in the baseline environmental conditions will occur. Similarly, the project will have a visible positive impact on the aesthetics and public health of the residents in the project area along with improvement in the socio-economic conditions of the local residents through generation of jobs and business opportunities once the park becomes operational.
- 357. Mitigation measures to help alleviating potential identified impacts have been recommended and an EMP has been provided for implementation of these mitigation measures. Furthermore, PMU KPCIP will ensure that the selected construction contractor has contractual obligation with respect to EMP implementation. Also, WSSC Abbottabad

will ensure appropriate staffing and budgeting for effective implementation and monitoring of project EMP.

56. Based on the findings of the IEE, this subproject is unlikely to cause any significant, irreversible or unprecedented environmental impacts. The potential impacts localized, temporary in nature and can be addressed through proven mitigation measures. Hence, the classification of the subproject as Category B per ADB SPS, 2009 is confirmed. No further study or assessment is required at this stage.

11 References

- Ahmed, M. and Suphachalasai, S. (2014). Assessing the Cost of Climate Change and Adaptation in South Asia. Manila: ADB
- Anjum, B. F. et al. (2005). Climate Change Perspective in Pakistan. *Pakistan Journal of Meteorology*. 2(2). pp. 11–21
- Asian Development Bank (2017a): Mainstreaming Climate Risk Management into Urban Infrastructure Investments through Urban Resilience Assessments (URAs), Peshawar City, Khyber Pakhtunkhwa, Pakistan (UCCRTF TA-8913 PAK).
- Asian Development Bank (2017b). Climate Change Operational Framework 2017-2030: Enhancing Actions for Low Greenhouse Gas Emissions and Climate-Resilient Development, Retrieved from: <https://www.adb.org/sites/default/files/institutional-document/358881/ccof-2017-2030.pdf>
- ADB, Safeguards Unit for Central & West Asia Department, Environmental Management for Construction Handbook.
- Asian Development Bank (2017c). Climate Change Profile of Pakistan. ISBN 978-92-9257-721-6 (Print), 978-92-9257-722-3 (e-ISBN). Publication Stock No. TCS178761. DOI: <http://dx.doi.org/10.22617/TCS178761>. Retrieved from: <https://www.adb.org/sites/default/files/publication/357876/climate-change-profile-pakistan.pdf>
- Asian Development Bank (2014). Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific
- National Disaster Management Authority 2008: Seismic Zoning Map of Pakistan
- EIA of Hasanabdal – Havelian Section of E-35 Project.
- 1998 District census report of Abbottabad. Census publication. Islamabad: Population Census Organization, Statistics Division, Government of Pakistan. 1999
- Chaudhry, Q. Z. et al. (2009). Climate Change Indicators of Pakistan. Technical Report. No. 22. Islamabad: Pakistan Meteorological Department.
- IPCC (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Rehman, N., Adnan, M. and Ali, S. (2018) 'Assessment of CMIP5 climate models over South Asia and climate change projections over Pakistan under representative concentration pathways', *Int. J. Global Warming*, Vol. 16, No. 4, pp.381–415.

ANNEXURES

Annexure A

REA Checklist

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Pakistan/Khyber Pakhtunkhwa Cities Improvement Project (KPCIP)
Sector Division:	Green Urban Spaces – Remediation of Solid Waste Dump and conversion into Park at Salhad

Screening Questions	Yes	No	Remarks
A. Project Sitting Is the project area ?			
▪ Densely populated?		✓	Site is located about 3 km from Abbottabad city towards Haripur. The site is not densely populated however nearest population is at 200 m. There is scattered mid-density of settlements around the proposed site area.
▪ Heavy with development activities?		✓	No heavy development activities are there around the proposed site.
▪ Adjacent to or within any environmentally sensitive areas?		✓	No environmental sensitive area (national park/protected areas) is present adjacent to, near or within the project area.
• Cultural heritage site		✓	No heritage site within or near the project area.
• Protected Area		✓	No protected area/s within or around the project site.
• Wetland		✓	No wetland within or around the project site is available.

Screening Questions	Yes	No	Remarks
• Mangrove		✓	No mangroves available within or around the project area.
• Estuarine		✓	No, estuarine located within or around the project site.
• Buffer zone of protected area		✓	The project site does not enclose any buffer zones of protected areas.
• Special area for protecting biodiversity.		✓	The project site is not located in any special area for protecting biodiversity.
• Bay		✓	There is no bay on the site.
B. Potential Environmental Impacts Will the Project cause			
▪ Impacts on the sustainability of urban green spaces and their interactions with other urban services.		✓	The project aims to stop existing dumping of solid waste at Salhad which is serious environmental risk in the project area. Conversion of this existing dumping into Park will result in long term positive impacts on the area and will improve sustainability of urban green spaces.
▪ Degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		✓	The existing natural terrain and its associated wildlife will be conserved in the proposed project. Conversion of existing dump into park will stop the on-going degradation of land and ecosystem. It will stop the feeding of birds over the waste heaps and also stop cattle grazing
▪ Dislocation or involuntary resettlement of people?		✓	The land (12.5 acres) is owned by cantonment & TMA, since TMA is the implementing agency there is a need of NOC from the cantonment. Project does not involve land acquisition and resettlement impacts.
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?		✓	No disproportionate impacts will be caused by this project. Residents in the immediate vicinity of site, residents of Abbottabad and other tourists will all benefit equally from the project.
▪ Degradation of cultural property, and loss of cultural heritage and tourism revenues?		✓	At present, the site under consideration for the project is not used for tourism, however, has great potential as hot spot for commercial tourism. The project will increase tourism and help to generate revenue.

Screening Questions	Yes	No	Remarks
▪ Occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?	✓		As site is being used for dumping of solid waste by TMA and cantonment board therefore no future occupation of low lying lands for the project. Project will not pose potential community impacts however it will result in improved aesthetics of the area. The project will not cause the risk of health hazards to low-income and squatter groups.
▪ Water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality, and pollution of receiving waters ?	✓		Project will not impact water resources problems however it will reduce existing degradation of water resources due to on-going dumping of wastes.
▪ Air pollution due to urban emissions?	✓		As project involves conversion of dumping site into park through plantation of trees therefore no urban emissions are anticipated.
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?	✓		There are risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during construction phase. There is need of trained civil contractor to manage the project without exposure to already dumped waste. However during operation phase no such impacts are involved.
▪ Road blocking and temporary flooding due to land excavation during rainy season?	✓		Road blocking and temporary flooding will not occur due to project activities.
▪ Noise and dust from construction activities?	✓		Negligible noise and dust will be generated from landscaping interventions as it involves plantation and limited civil construction activities.
▪ Traffic disturbances due to construction material transport and wastes?	✓		By adopting best construction management techniques and practices, potential disturbances during construction will be minimized. Since the project site is located on the outskirts of Abbottabad, traffic in the main city will not be disturbed. Low-traffic hours will also be selected for the transportation of materials.
▪ Temporary silt runoff due to construction?	✓		The removal of existing dumped waste during rainy season may cause silt run off. Best management practices will be adopted to minimize the runoff.

Screening Questions	Yes	No	Remarks
▪ Hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?	✓		Construction and operation phases will not cause pollution, thermal inversion, or smog.
▪ Water depletion and/or degradation?	✓		Minimal and efficient use of water will be made during construction and operation phases, thereby mitigating the issue of water depletion or degradation.
▪ Overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?	✓		Construction and operation phases will not make use of groundwater - natural springs and rainwater will be used instead.
▪ Contamination of surface and ground waters due to improper waste disposal?	✓		An appropriate waste collection system will be developed for the proposed project at the site.
▪ Pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?	✓		Project construction and operation does not involve such activities that can pollute water resources and cause health problems.
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?	✓		The development of Salhad Park will be limited in spatial and temporal terms, and not likely to place any burden on existing social infrastructure or services. No migration will occur.
▪ Social conflicts if workers from other regions or countries are hired?	✓		To avoid social conflicts, the hiring of local laborers and construction firms will be given preference over the hiring of workers from other regions.
▪ Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?	✓		During construction waste will be transported to landfill site area which can cause risk to community health and safety if not handled properly. Best management practices will be adopted to minimize the risk of exposure to hazardous substances during transport, storage and disposal.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?	✓		There is stormy river located nearby solid waste dumping site which may pose risk of flooding in high precipitation events. Safety measures will be implemented to prevent communities from getting exposed to any hazards during the construction phase. No considerable natural hazards are expected once the construction phase is over. Structural components will be constructed according to the standards of natural hazard safety factors.

Project fall in category: (A) _____ (B) (C) _____ (F) _____

Climate Change and Disaster Risk Questions	Yes	No	Remarks
<p>The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.</p>			
<ul style="list-style-type: none"> ▪ Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes (see Appendix I)? 	✓		Yes, it is subject to earthquakes, landslides and storm surges (that could be aggravated by climate change).
<ul style="list-style-type: none"> ▪ Could changes in precipitation, temperature, salinity, or extreme events over the Project lifespan affect its sustainability or cost? 		✓	
<ul style="list-style-type: none"> ▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g. high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)? 		✓	
<ul style="list-style-type: none"> ▪ Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)? 		✓	

Annexure B

Questionnaires for Conducting FGDs & Surveys

Focal Group Discussion (FGDs)

Project Name:

Venue:

Sr no _____

Date:

Sr no	Name	Profession	CNIC	Moza/Village UC, Tehsil & District	Signature/Thumb
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

SOCIO-ECONOMIC AND MIGRATION SURVEY FOR KUCHIUM PROJECTS

Date: _____

Sr No. _____

1. Identification

1.1 Name of Respondent

1.2 Father's Name

1.3 Respondent CNIC No:

1.4 Tribe

1.5 Address: Village:

Town: _____

Tehsil: _____

District: _____

Province: _____

1.6 Demographic Profile of Respondent (Children up to 10 yrs (#): M _____ F _____ T _____)

Sr. No.	Relationship with Respondent (See codes)	Sex Male=1 Female=2	Age (Yrs.)	Education (See Codes)	Name of Business/ Occupation (See Codes)		Income From Business/ Occupation (Rs./ Annum)		Diseases During Last Year (See codes)
					Main	Secondary	Main	Secondary	
1	SELF								
2									
3									
4									
5									
6									
7									
8									
9									
10									

*Other: Rent from property, remittances, net sale of items during a year, net income from agriculture etc.

Demographic Codes:

Relationship: 1=Self, 2=Wife, 3=Son, 4=Daughter, 5=Father, 6=Mother, 7=Brother, 8=Sister, 9=Grand Father, 10=Grand Mother, 11=Bhabhi, 12=Nephew, 13=Father-in-Law, 14=Mother-in-Law, 15=Others

Sex: 1=Male, 2=Female

Education: 1= Primary 2= Middle 3= Matric, 4= Intermediate, 5= BA/BSc, 6= MA/MSc, 7=LLB, 8=Engineer, 9=MBBS, 10=Technical Diploma, 11=Dars-e-Nizami, 12=CanRead Quran, 13= Can Insert Signatures, 14= Illiterate,

Occupations: 1=Agriculturist, 2=Shopkeeper, 3= Trader, 4= Govt. Servant, 5=Private Servant, 6=Timber Labour, 7=General Labour, 8=Livestock, 9=Fishing, 10=8=Driver, 11=Health Related, 12=Educator/Teacher, 13=House-Maid, 14= House Wife, 15=Gone Abroad, 16=Gone out City within Pakistan

Diseases: 1=Diarrhea, 2=Measles, 3=Hepatitis, 4=Typhoid, 5=HIV/AIDS, 6=Polio, 7=Cholera, 8=Tuberculosis, 9=Heart Disease, 10>No Disease,

- 1.7 Are you member of any village Community organization ____ 1. Yes 2. No
 1.8 If yes, which of the following organizations?

- i. Religious ii. Political iii. Law & Order
 iv. Educational (formal/informal) v. Community Organization vi. Local Jirga
 vii. Youth Organization viii. Any other
2. Land Utilization

Land	Acre	Kanal	Maria
Total Area owned			
Total Cultivated Area			
Area Under Rabi (winter) Crops			
Area Under Kharif (summer) Crops			
Uncultivated Area			
Waste land			
Area Under Farm Houses			
Barren Land			

2.1 Cropping Pattern, Yield and Cost

Sr. No.	Major Crops	Area Sown		Average Production (Kgs)	Price/40 kgs (Rs.)	Total Cost Incurred (Rs.)
		Acre	Kanal			
1.	Wheat					
2	Maize					
3	Cotton					
4	Rice					
5	Sugarcane					
6	Orchards					
7	Other (_____)					
8	Grand Total:					

2.2 Land Tenure Status: Owner Tenant Share Cropper

2.3 Land Rent (Rs. / acre) _____

3. Possession of Household Goods

Item	No.	Value (Rs.)	Item	No.	Value (Rs.)
Television			Car		
Washing machine			Van/Pickup		
Geyser			Gas Cylinder		
Electric fan			VCR/DVD Player		
Electric iron			Dish Antenna/Cable Connection		

Item	No.	Value (Rs.)	Item	No.	Value (Rs.)
Sewing machine			Telephone/Mobile		
Radio/tape recorder			Electric Water Pump		
Motor cycle/ scooter			Computer		
Other			Other		
Total:			Total:		

4. Average Monthly Expenditure on Food and Non-Food Items

4.1 Monthly Expenditure on Food & Non-Food Items (Rs.)

a) Expenditures on Food Items

Sr. No.	Item	Qty. / Month	Expenditure (Rs.)
1.	Wheat / Atta (Flour)		
2.	Maize Flour		
3.	Ghee		
4.	Sugar		
5.	Legumes		
6.	Vegetables		
7.	Tea Leaves		
8.	Milk		
9.	Other Specify		
10.	Total:		

b) Exp. On Non-Food Items:

1.	Fire wood		
2.	Gas Cylinder		
3.	Kerosene Oil		
4.	Washing Material		
5.	Other Specify		
6.	Total:		

4.2 Expenditure on clothes and shoes during last year: Rs.

4.3 Occasional expenses during last year
(such as meeting social obligation expenditure) Rs.

4.4 Av. Monthly utility bills for: Electricity (Rs.)

Communication (Rs.) Water (Rs.)

4.5 Annual Expenditure on Health Care (Rs.):

5. Social Organizations

7.1 Have you obtained credit during last year? Yes [] No. [] If yes, source of credit:
 Formal [] Informal []

7.2 Please write the name of relevant source

Formal source (s) _____
 Informal source (s) _____
 Percentage of interest _____

7.3 Purpose of Loan (Tick)

Purchase House	<input type="checkbox"/>	Rs. _____
Business	<input type="checkbox"/>	Rs. _____
Repair of House	<input type="checkbox"/>	Rs. _____
Medicare of Family Member	<input type="checkbox"/>	Rs. _____
Family/ Social matters	<input type="checkbox"/>	Rs. _____
Farm inputs	<input type="checkbox"/>	Rs. _____
Livestock	<input type="checkbox"/>	Rs. _____
Other (specify)	<input type="checkbox"/>	Rs. _____

7.4 Mode of repayment (Tick the relevant)

- 1) One time [] 2) Through installments [],
 i) Quarterly installments [] ii) Six monthly [],
 iii) Annual [] iv) Other (specify) _____

7.5 How much repayment has been made so far? a) 100% [], b) 75% [], c) 50% [],
 d) 25% [], Less than 25% []

8. Housing Conditions

8.1 Do you have your own house?

1) Yes _____ 2) No. _____

If yes then

8.2 Total Area of the house: square ft. Present Value (Rs) _____

Type of Room	No. of Room	Katcha (tick)	Pacca (tick)	Semi Pacca (tick)
Living rooms				
Animal shed				
Other shed				
Bathroom				
Latrine				
- Open				
- Flush				

8.3 Other Assets				
Shop (Sq. ft):	L	W	Area (Ft.)	
Khokha:				
Electric Pump / Hand Pump (No.):				
Hydropower Generator:				
Other (_____) (No.):				
8.4 Trees				
- Mature Fruit Trees (No.):				
- Mature Shade Trees (No.):				
9. Access to Social Amenities (Tick)				
Social Amenities	Available	Satisfactory	Non-Satisfactory	No Access
Electricity				
Sui Gas				
Water Supply				
Telephone				
Sewerage/Drainage				
BHU				
School				
Others				

10. Livestock Inventory

Livestock	No.	Present Value (Rs.)
Buffaloes		
Cows		
Horse		
Donkey		
Mule	-	
Sheep		
Goat		
Poultry		
Other		

11. Women's Participation and Decision Making in Different Activities

11.1 Women participation in different household activities

Activities	Participation (%)	Decision Making (%)
Household activities	<input type="text"/>	<input type="text"/>

Child caring	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Farm/Crop activities	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Livestock rearing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Sale & Purchase of properties	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Social obligations (marriage, birthday & other functions)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Local representation (councilor/political gathering)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>

11.2 Women issues in the project area

11.3 Women views about the project

12. Perceptions of Respondents for Action Associated with the Project

	Increase	Decrease
Employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>
Marketing facilities opportunities	<input type="checkbox"/>	<input type="checkbox"/>
Living standard	<input type="checkbox"/>	<input type="checkbox"/>
Unemployment	<input type="checkbox"/>	<input type="checkbox"/>
Income generating activities	<input type="checkbox"/>	<input type="checkbox"/>
Mobility (Access to Resources)	<input type="checkbox"/>	<input type="checkbox"/>
Quality of drinking water	<input type="checkbox"/>	<input type="checkbox"/>
Agriculture water	<input type="checkbox"/>	<input type="checkbox"/>
Trend of fish farm	<input type="checkbox"/>	<input type="checkbox"/>
Other specify _____		

13. General Remarks of the Respondents

14. Resettlement Part

14.1 Do you feel any disbursement impact? Yes _____ No _____

If yes then

Category	Area Acre	Kanal	Value of Land (Rs.)	Remarks
Cultivated				
Uncultivated				
Grazing				
Barren Land				
Waste Land				
Other				
Total				

14.2 Affected Cropping Area

Yes _____ No _____
If yes then

Name of Crop	Acre	Kanal	Value (Rs.)
Rabi			
Kharif			
Total:			

14.3 Affected residential structures

Name of Structure	Types of Structures			Area		Value of Structure
	Kacha	Pacca	Semi Pacca	Sq. ft.	Rft.	
Houses						
Boundary Wall						
Other						

14.4 Impact on Farm House

Yes _____ No _____
If yes then

Name	Type of Farm House			Area		Value (Rs.)
	Kacha	Pacca	Semi Pacca	Sq. ft	Rft.	
Rooms						
Cattle Shed						
Boundary Wall						
Other						

14.5 Impact of Tube wells

Yes _____ No _____

If yes then

Types of Tube wells	No.	Value (Rs.)
Electric		
Diesel		
Turbine		
Other		
Total:		

14.6 Impact on Utility

Yes _____ No _____

If yes then

Types	Nos. / Area
Electric poles	
Transformer	
Transmission line	
Telephone	
Other	
Total:	

14.7 Impact on Community Structure

Name	Yes	No	Value (Rs.)
Schools			
Mosque			
Graveyard			
Health Centre			
Shrine			
Others			
Total:			

14.8 How to shift shrines / graveyards?

14.9 Miscellaneous Impacts of the Project

14.10 Do you have any alternate residence place?

Yes No

If yes then (tick relevant)

Own Land / House	Yes/No	Location-	Distance from current residence (km)
Tenancy			
Relative			
Other			

14.11 Mode of Payment

Land for land _____
 Cash compensation _____
 Kind _____
 Other _____

15. Project

16. Views / Comments of Interviewers

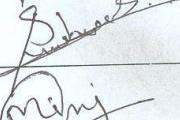
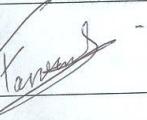
Name & Signature of Interviewer: _____ Date: _____

Annexure C

Details of public consultations

Project Name: Khyber Pakhtunkhwa Cities Improvement Project (Salhad Green Park Abbottabad).
Date: 04-05-2021.
Venue: Salhad Abbottabad.

Sr. No.	Name	CNIC	Signature
①	Khursheed Ahmed Tanvi	13503-0572151-9	Khurshid
②	عالم زبید ولد علی	42000-62280951	
③	عبدالرشید ولد سعید	13503-8699354-3	
④	M. Saddiq S/o Faqir Muhammad	13503-9153886-9	
⑤	علی علی ولد علی	13503-5958128-3	
⑥	علی علی ولد علی	13503-0571953-5	
⑦	M. Sarfraz S/o Khan Muhammad	13503-0674916-8	
⑧	M. Yaqoob S/o Abdulghani	13503-0674896-7	
⑨	M. Jameel S/o Mirzaian	13503-0613320-1	
⑩	عین علی ولد علی	13503-6127806-5	
⑪	دین علی ولد علی	13503-0658366-9	

Sr. No.	Name	CNIC	Signature
(17)	M. Masveen S/o Shabir Karim	13503-0651307-3	
(18)	Aslam Jibran	13503-6446894-9	Faria U.
(19)	Ali Khan S/o		
(20)	Wazir Muhammad Sikandar		
(21)	Jalilah Naseem	13503-05564396-7	
(22)	Rehan Khan	13505-5428252-7	
(23)	M. Riaz S/o Sultan Muhammad	13503-05564419-9	
(24)	Farooq S/o Muzamil	13503-2107332-1	
(25)	M. Farooq S/o Faiyaz Ali	13503-0660316-5	

Name of Persons Consulted

Name	ID Card No.	Designation/Profession
Khursheed Ahmed Tanoli	13503-0572151-9	Retired Army Officer
Alamzaib s/o Mir Muhammad	42000-6228095-1	Land holder
Abdul Rasheed, s/o Sultan Muhammad	13503-8699354	Private Business
Muhammad Saddiq s/o Faqir Muhammad	13503-9153886-9	Transporter
Ali Zaman s/o Rhmat ullah	13503-0571953-5	Bank Officer
Muhammad Masqueen s/o Gulzaman	13503-05958128-3	Private Business
M. Sarfraz s/o Khan Muhammad	13503-1783080-5	Private Business
M. Yaqoob s/o Abdul Ghani	13503-0674896-7	Private Business
M. Jamil s/o Khaliq Nawaz	13503-0613320-1	Civil Contractor
Atiq –ur-Rehman, Khanud din	13503-6127806-5	Private Business
Syed Shah s/o Mubarik	13503-0651366-9	Private Business
Muhammad Musqan s/o Abdul Karim	13503-651307-3	Private Business
M. Tariq, s/o Wali Muhammad	13503-6446894-9	Private Business
Taj Muhammad s/o Gulzar	--	Private Business
Wazir Muhammad s/o Sikandar	--	Unemployed

Name	ID Card No.	Designation/Profession
Shamsheer Feroz, s/o Feroz Ameen	--	Unemployed
Muhammad Meraj,s/o Muhammad Sarwar	--	Labor Work
M. Riaz, s/o Sultan Muhammad	--	Unemployed
Qari Muhammad Amir, s/o Amir Younas	13503-2107332-1	Moozan (Imam Masjid)
Muhammad Farooq s/o Faiq Ali	--	Unemployed

Annexure D

Environmental Baseline Monitoring

Air Quality Particulate Matter**AMBIENT PARTICULATE MATTERS MONITORING REPORT**

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, District Abbottabad, Kpk
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project	Monitoring Date:	15-04-2021
Source:	Ambient Air	Reporting Date:	23-04-2021
GPS Coordinates:	34° 7'30.65"N 73° 11'13.21"E	Monitoring Instrument:	AQMS 65, Serial #1310

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Hours	Units		
1.	09:00 A.M	19.4	98.4		
2.	10:00 A.M	19.1	105.3		
3.	11:00 A.M	22.7	95.7		
4.	12:00 P.M	23.6	91.4		
5.	01:00 P.M	25.7	85.3		
6.	02:00 P.M	23.8	88.1		
7.	03:00 P.M	24.6	89.4		
8.	04:00 PM	26.7	86.6		
9.	05:00 PM	26.3	86.8		
10.	06:00 PM	24.1	85.6		
11.	07:00 PM	23.7	86.4		
12.	08:00 PM	26.9	83.5	23.00 (µg/m³)	83.72 (µg/m³)
13.	09:00 PM	23.1	83.3		
14.	10:00 PM	24.8	84.1		
15.	11:00 PM	24.1	79.7		
16.	12:00 AM	24.9	76.3		
17.	01:00 AM	19.8	78.2		
18.	02:00 AM	20.6	74.6		
19.	03:00 AM	24.8	79.8		
20.	04:00 AM	22.7	68.9		
21.	05:00 AM	24.3	75.6		
22.	06:00 A.M	19.8	75.6		
23.	07:00 A.M	18.4	74.1		
24.	08:00 A.M	18.2	76.8		
NEQSAA			35 (µg/m³)	150 (µg/m³)	
WHO			25 (µg/m³)	50 (µg/m³)	

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
Signature of Analyst:*[Signature]*
Signature of Chief Chemist**FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS**

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan





AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, District Abbottabad, Kpk
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project	Reporting Date:	23-04-2021
Monitoring Date:	16-04-2021	Monitoring Instrument:	AQMS 65, Serial #1310
Source:	Ambient Air		
GPS Coordinates:	34° 7'31.99"N 73° 11'21.84"E		

Sr. No	Time	Parameters		Results	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Hours	Units		
1	10:00 A.M	25.9	104.9		
2	11:00 A.M	26.7	99.7		
3	12:00 P.M	27.4	97.6		
4	01:00 P.M	23.6	91.6		
5	02:00 P.M	28.9	89.7		
6	03:00 P.M	25.1	89.3		
7	04:00 PM	27.5	89.1		
8	05:00 PM	23.4	85.6		
9	06:00 PM	27.6	81.3		
10	07:00 PM	23.6	89.5		
11	08:00 PM	25.8	86.2		
12	09:00 PM	23.9	79.8		
13	10:00 PM	29.8	83.3		
14	11:00 PM	23.7	85.3		
15	12:00 AM	23.1	75.1		
16	01:00 AM	21.8	76.3		
17	02:00 AM	23.4	78.2		
18	03:00 AM	21.6	69.3		
19	04:00 AM	19.8	69.5		
20	05:00 AM	17.6	68.9		
21	06:00 A.M	23.8	72.8		
22	07:00 A.M	24.7	75.6		
23	08:00 A.M	20.9	76.1		
24	09:00 A.M	19.6	78.6		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				25 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
Signature of Analyst:*[Signature]*
Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www. iec-consultants.com



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, Environment Laboratory
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk
Monitoring Date:	17-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Air	Monitoring Instrument:	AQMS 65, Serial #1310
GPS Coordinates:	34° 7'25.90"N 73°11'19.62"E		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Hours	Units ($\mu\text{g}/\text{m}^3$)		
1	10:15 AM	27.8	99.1		
2	11:15 AM	25.3	103.7		
3	12:15 PM	24.6	105.7		
4	01:15 PM	28.6	108.6		
5	02:15 PM	21.6	101.7		
6	03:15 PM	20.8	109.5		
7	04:15 PM	18.9	95.7		
8	05:15 PM	23.7	98.4		
9	06:15 PM	24.8	93.4		
10	07:15 PM	22.1	80.1		
11	08:15 PM	21.3	79.5		
12	09:15 PM	19.7	95.6	23.58 ($\mu\text{g}/\text{m}^3$)	84.28 ($\mu\text{g}/\text{m}^3$)
13	10:15 PM	19.4	94.6		
14	11:15 PM	21.8	75.6		
15	12:15 AM	23.4	76.1		
16	01:15 AM	21.7	69.7		
17	02:15 AM	18.2	65.8		
18	03:15 AM	27.3	78.3		
19	04:15 AM	28.9	76.1		
20	05:15 AM	22.7	59.7		
21	06:15 AM	23.6	63.8		
22	07:15 AM	25.6	64.8		
23	08:15 AM	24.8	58.3		
24	09:15 AM	28.9	69.1		
NEQSAA			35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	
WHO			25 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
 Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www. iec-consultants.com



Integrated Environment Laboratory



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, Environment Laboratory
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk
Monitoring Date:	19-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Air	Monitoring Instrument:	AQMS 65, Serial #1310
GPS Coordinates:	34° 7'28.55"N 73°11'12.59"E		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Hours	($\mu\text{g}/\text{m}^3$)		
1	10:30 AM	29.8	89.3		
2	11:30 AM	27.6	86.3		
3	12:30 PM	25.1	81.7		
4	01:30 PM	26.3	85.4		
5	02:30 PM	25.1	95.4		
6	03:30 PM	27.6	90.3		
7	04:30 PM	29.4	82.6		
8	05:30 PM	24.8	91.2		
9	06:30 PM	28.6	89.3		
10	07:30 PM	26.4	86.4		
11	08:30 PM	25.6	86.3		
12	09:30 PM	23.6	84.7		
13	10:30 PM	20.3	76.8	23.65 ($\mu\text{g}/\text{m}^3$)	77.21 ($\mu\text{g}/\text{m}^3$)
14	11:30 PM	19	75.1		
15	12:30 AM	22.8	73.2		
16	01:30 AM	22.3	71		
17	02:30 AM	24.6	69.6		
18	03:30 AM	25.6	65.3		
19	04:30 AM	23.4	65.8		
20	05:30 AM	19.3	59.5		
21	06:30 AM	17.8	68.4		
22	07:30 AM	18.3	61.8		
23	08:30 AM	17.6	59.3		
24	09:30 AM	16.9	58.4		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				25 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature] Signature of Analyst:*[Signature]* Signature of Chief Chemist:

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5852913 Cell: +91 982 8656789



AMBIENT GASEOUS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site	Salhad
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk	Environment Laboratory
Monitoring Date:	15-04-2021	Reporting Date:	23-04-2021	Integrated Environment Laboratory
Source:	Ambient Air (Gaseous)	Monitoring Instrument:	AQMS 65, Serial # 1310	Environment Laboratory
GPS Coordinates:	34° 7'30.65"N 73°11'13.21"E			Integrated Environment Laboratory

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.65	15.23	22.89	25.36
2.	10:00 A.M	0.59	14.58	21.79	24.12
3.	11:00 A.M	0.55	17.69	20.74	23.56
4.	12:00 P.M	0.65	15.25	19.87	25.12
5.	01:00 P.M	0.66	15.48	18.64	24.78
6.	02:00 P.M	0.67	15.67	19.23	19.18
7.	03:00 P.M	0.69	15.27	18.75	20.21
8.	04:00 PM	0.79	14.32	20	23.56
9.	05:00 PM	0.75	13.98	17.82	24.12
10.	06:00 PM	0.78	14.34	19.88	25.36
11.	07:00 PM	0.69	13.98	20.62	24.23
12.	08:00 PM	0.69	14.89	17.32	26.34
13.	09:00 PM	0.66	13.03	18.49	27.56
14.	10:00 PM	0.68	13.11	21.72	25.46
15.	11:00 PM	0.79	13.89	22.12	25.12
16.	12:00 AM	0.71	13.47	21.78	13.47
17.	01:00 AM	0.73	15.87	19.86	25.83
18.	02:00 AM	0.75	14.09	22.34	22.01
19.	03:00 AM	0.88	14.62	21.85	24.81
20.	04:00 AM	0.74	13.81	18.23	23.58
21.	05:00 AM	0.63	11.89	17.45	21.44
22.	06:00 A.M	0.87	12.81	22.65	19.64
23.	07:00 A.M	0.61	12.56	19.87	21.47
24.	08:00 A.M	0.58	14.27	18.29	20.18
Average Concentration		0.69	14.33	20.09	23.18
NEQSAA		05 (24 hr)	40 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		---	---	200 (24 hrs)	20 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were mg/m³ and µg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
 Tel: 091-5852913 Cell: +92 302 8462412 Email: info@consultantspk.com





AMBIENT GASEOUS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk
Monitoring Date:	16-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Air (Gaseous)	Monitoring Instrument:	AQMS 65, Serial # 1310
GPS Coordinates:	34° 7'31.99"N 73° 11'21.84"E		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)
1.	10:00 A.M	0.69	17.32	24.36	28.65
2.	11:00 A.M	0.63	17.39	25	27.36
3.	12:00 P.M	0.58	16.89	23.26	25.68
4.	01:00 P.M	0.65	15.25	21.35	24.68
5.	02:00 P.M	0.67	14.87	20.65	24.78
6.	03:00 P.M	0.71	15.67	23.56	23.56
7.	04:00 PM	0.72	15.27	24.56	21.87
8.	05:00 PM	0.77	13.56	25.36	23.56
9.	06:00 PM	0.75	13.98	17.82	24.12
10.	07:00 PM	0.78	14.78	19.88	25.36
11.	08:00 PM	0.82	13.98	20.62	25.36
12.	09:00 PM	0.81	14.89	17.32	26.34
13.	10:00 PM	0.79	12.89	18.49	27.56
14.	11:00 PM	0.77	15.61	21.72	25.46
15.	12:00 AM	0.79	13.89	22.12	26.89
16.	01:00 AM	0.71	14.56	22.56	13.47
17.	02:00 AM	0.73	15.87	19.86	25.83
18.	03:00 AM	0.69	13.26	22.34	24.56
19.	04:00 AM	0.88	14.62	23.56	24.81
20.	05:00 AM	0.74	15.48	18.23	22.58
21.	06:00 A.M	0.71	14.56	20.68	21.44
22.	07:00 A.M	0.72	14.25	19.86	22.46
23.	08:00 A.M	0.61	15.26	20.78	20.56
24.	09:00 A.M	0.65	18.46	22.36	21.87
Average Concentration		0.72	15.10	21.51	24.11
NEQSAA		05 (24 hr)	40 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		---	---	200 (24 hrs)	20 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were mg/m³ and µg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
*Signature of Analyst:**[Signature]*
Signature of Chief Chemist:

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan





AMBIENT GASEOUS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk
Monitoring Date:	17-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Air (Gaseous)	Monitoring Instrument:	AQMS 65, Serial # 1310
GPS Coordinates:	34° 7'25.90"N 73°11'19.62"E		

Sr. No	Time	Parameters			
		Units			
		CO (mg/m³) Hours	NO (µg/m³)	NO₂ (µg/m³)	SO₂ (µg/m³)
1.	10:15 AM	0.75	19.32	20.38	25.56
2.	11:15 AM	0.76	18.32	22.36	24.35
3.	12:15 PM	0.73	17.56	24.56	23.89
4.	01:15 PM	0.74	16.56	16.38	25.56
5.	02:15 PM	0.69	15.23	15.68	23.45
6.	03:15 PM	0.83	14.23	17.89	22.45
7.	04:15 PM	0.69	14.67	17.82	20.14
8.	05:15 PM	0.65	16.64	16.56	22.78
9.	06:15 PM	0.63	12.36	16.37	19.89
10.	07:15 PM	0.79	13.67	17.42	18.56
11.	08:15 PM	0.68	13.75	14.56	18.84
12.	09:15 PM	0.59	11.28	15.58	17.56
13.	10:15 PM	0.58	12.76	14.87	19.74
14.	11:15 PM	0.78	12.84	13.56	16.97
15.	12:15 AM	0.79	15.38	18.97	16.56
16.	01:15 AM	0.69	14.56	14.56	20.58
17.	02:15 AM	0.56	13.48	16.34	18.69
18.	03:15 AM	0.64	14.78	15.78	22.45
19.	04:15 AM	0.63	13.56	15.56	21.74
20.	05:15 AM	0.72	15.68	17.36	19.38
21.	06:15 AM	0.67	14.57	16.59	17.64
22.	07:15 AM	0.86	16.57	12.67	23.56
23.	08:15 AM	0.59	14.25	15.36	24.15
24.	09:15 AM	0.72	13.59	16.59	21.48
Average Concentration		0.69	14.81	16.82	21.08
NEQSAA		05 (24 hr)	40 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		---	---	200 (24 hrs)	20 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were mg/m³ and µg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYSSignature of Chief ChemistCreative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www. iec-consultants.com



AMBIENT GASEOUS MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk
Monitoring Date:	19-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Air (Gaseous)	Monitoring Instrument:	AQMS 65, Serial # 1310
GPS Coordinates:	34° 7'28.55"N 73°11'12.59"E		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)
1.	10:30 AM	0.71	14.23	19.67	26.57
2.	11:30 AM	0.75	13.56	18.23	25.13
3.	12:30 PM	0.72	12.12	17.23	24.56
4.	01:30 PM	0.71	13.45	16.58	25.89
5.	02:30 PM	0.65	13.78	14.56	27.59
6.	03:30 PM	0.69	12.97	14.78	22.81
7.	04:30 PM	0.75	15.89	18.76	20.83
8.	05:30 PM	0.69	13.88	18.29	19.83
9.	06:30 PM	0.64	12.56	15.21	17.89
10.	07:30 PM	0.85	14.58	16.48	15.29
11.	08:30 PM	0.89	13.56	17.45	15.79
12.	09:30 PM	0.72	15.78	14.23	16.93
13.	10:30 PM	0.76	16.59	13.67	17.59
14.	11:30 PM	0.78	14.78	16.89	17.36
15.	12:30 AM	0.69	17.67	15.12	19.56
16.	01:30 AM	0.67	15.12	19.56	16.29
17.	02:30 AM	0.78	12.56	17.89	17.45
18.	03:30 AM	0.64	13.89	13.56	16.57
19.	04:30 AM	0.89	14.67	14.58	15.49
20.	05:30 AM	0.75	15.53	15.89	17.25
21.	06:30 AM	0.73	12.85	15.46	19.37
22.	07:30 AM	0.73	13.47	17.69	16.52
23.	08:30 AM	0.71	14.56	14.59	18.26
24.	09:30 AM	0.75	16.31	13.56	16.26
Average Concentration		0.73	13.74	16.24	19.46
NEQSAA		05 (24 hr)	40 (24 hr)	80 (24 hr)	120 (24 hr)
WHO		---	---	200 (24 hrs)	20 (24 hrs)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were mg/m³ and µg/m³ otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

*[Signature of Analyst]**[Signature of Chief Chemist]*

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
 Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www.ice-consultants.com



Noise Level Monitoring



NOISE LEVEL MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad,
Project Name:	Khyber Pakhtunkhwa Improvement Project	Cities	District Abbottabad, Kpk
Monitoring Date:	15-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates	34° 7'30.65"N 73°11'13.21"E		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	63.5	64.1	63.8
2.	10:00 A.M		59.56	62.7	61.13
3.	11:00 A.M		59.7	62.3	61
4.	12:00 P.M		58.12	62.1	60.11
5.	01:00 P.M		59.6	61.89	60.745
6.	02:00 P.M		57.26	61.7	59.48
7.	03:00 P.M		61.2	62.8	62
8.	04:00 PM		58.7	60.2	59.45
9.	05:00 PM		58.4	61	59.7
10.	06:00 PM		57.6	58.6	58.1
11.	07:00 PM		58	60.6	59.3
12.	08:00 PM		60.3	62.7	61.5
13.	09:00 PM		57.6	60.2	58.9
14.	10:00 PM		57.4	58.4	57.9
15.	11:00 PM		59.1	59.6	59.35
16.	12:00 AM		56.9	59.5	58.2
17.	01:00 AM		58.65	60.9	59.775
18.	02:00 AM		57.3	59.6	58.45
19.	03:00 AM		56.3	58.9	57.6
20.	04:00 AM		61.8	63.8	62.8
21.	05:00 AM		57.3	59.3	58.3
22.	06:00 A.M		55.3	57.6	56.45
23.	07:00 A.M		56.1	57.9	57
24.	08:00 A.M		55.8	56.7	56.25

NEQS limit : 65 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization

Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:
Signature of Chief Chemist


FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
 Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www.iec-consultants.com



NOISE LEVEL MONITORING REPORT

Reference Number Project Name:	KPCIP/ENV/59-2021 Khyber Pakhtunkhwa Cities Improvement Project	Site Address:	Landfill Site Salhad, Environment Laboratory District Abbottabad, Kpk
Monitoring Date:	16-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651 Type-2
GPS Coordinates	34° 7'31.99"N 73°11'21.84"E		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	10:00 A.M	dB(A)	58.6	61.5	60.05
2.	11:00 A.M		55.3	58.1	56.7
3.	12:00 P.M		53.9	55.6	54.75
4.	01:00 P.M		56.8	59.4	58.1
5.	02:00 P.M		56.6	59.2	57.9
6.	03:00 P.M		56.4	58.4	57.4
7.	04:00 PM		58.1	59.8	58.95
8.	05:00 PM		55.8	58.4	57.1
9.	06:00 PM		59.4	62.7	61.05
10.	07:00 PM		56.8	57.6	57.2
11.	08:00 PM		55.3	57.9	56.6
12.	09:00 PM		56.1	57.9	57
13.	10:00 PM		54.9	57.5	56.2
14.	11:00 PM		54.7	57.2	55.95
15.	12:00 AM		55.4	57.1	56.25
16.	01:00 AM		54.2	56.8	55.5
17.	02:00 AM		57.6	58.4	58
18.	03:00 AM		53.8	56.4	55.1
19.	04:00 AM		56.8	58.6	57.7
20.	05:00 AM		54.7	57.6	56.15
21.	06:00 A.M		55.6	57.4	56.5
22.	07:00 A.M		53.4	55.6	54.5
23.	08:00 A.M		53.9	54.2	54.05
24.	09:00 A.M		58.6	60.3	59.45

NEQS limit : 65 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization

Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
 Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www. iec-consultants.com



Integrated Environment Laboratory



NOISE LEVEL MONITORING REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, Environment Lab
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbotabad, Kpk
Monitoring Date:	17-04-2021	Reporting Date:	23-04-2021
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates	34° 7'25.90"N 73°11'19.62"E		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	10:30 A.M	dB(A)	56.1	58.4	57.25
2.	11:30 A.M		57.1	58.6	57.85
3.	12:30 P.M		61.6	64.2	62.9
4.	01:30 P.M		61.4	64	62.7
5.	02:30 P.M		58.6	59.4	59
6.	03:30 P.M		61	63.6	62.3
7.	04:30 PM		60.3	63.4	61.85
8.	05:30 PM		54.8	58.4	56.6
9.	06:30 PM		60.3	62.9	61.6
10.	07:30 PM		58.4	59.7	59.05
11.	08:30 PM		59.9	62.5	61.2
12.	09:30 PM		57.6	58.1	57.85
13.	10:30 PM		59.5	62.1	60.8
14.	11:30 PM		56.2	58.4	57.3
15.	12:30 AM		58.7	61.6	60.15
16.	01:30 AM		58.8	61.4	60.1
17.	02:30 AM		53.6	55.9	54.75
18.	03:30 AM		58.4	62.4	60.4
19.	04:30 AM		56.1	57.6	56.85
20.	05:30 AM		59.3	61.2	60.25
21.	06:30 A.M		57.7	60.3	59
22.	07:30 A.M		64.8	65	64.9
23.	08:30 A.M		59.8	61.2	60.5
24.	09:30 A.M		60.2	62.7	61.45

NEQS limit : 65 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization

Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5857013 Call: 107 307 8167/17 Email: inenvconsultants@yahoo.com www.iec-consultants.com



Integrated Environment Labor

NOISE LEVEL MONITORING REPORT							
Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill	Site	Salhad,	Environment Labor	
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project		District Abbottabad, Kpk			Integrated Environment Labor	
Monitoring Date:	19-04-2021	Reporting Date:	23-04-2021			Integrated Environment Labor	
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2			Integrated Environment Labor	
GPS Coordinates	34° 7'28.55"N 73° 11'12.59"E					Integrated Environment Labor	
Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq	Integrated Environment Labor	
1.	10:15 AM	dB(A)	63.8	65.4	64.6	Integrated Environment Labor	
2.	11:15 AM		60.8	62.3	61.55	Integrated Environment Labor	
3.	12:15 PM		57.3	59.6	58.45	Integrated Environment Labor	
4.	01:15 PM		58.9	61.7	60.3	Integrated Environment Labor	
5.	02:15 PM		56.4	58.3	57.35	Integrated Environment Labor	
6.	03:15 PM		58	60.6	59.3	Integrated Environment Labor	
7.	04:15 PM		58.6	61.7	60.15	Integrated Environment Labor	
8.	05:15 PM		55.8	57.2	56.5	Integrated Environment Labor	
9.	06:15 PM		57.3	59.9	58.6	Integrated Environment Labor	
10.	07:15 PM		59.7	57.6	58.65	Integrated Environment Labor	
11.	08:15 PM		59.8	61.4	60.6	Integrated Environment Labor	
12.	09:15 PM		58.6	59.3	58.95	Integrated Environment Labor	
13.	10:15 PM		56.5	59.1	57.8	Integrated Environment Labor	
14.	11:15 PM		62.4	63.8	63.1	Integrated Environment Labor	
15.	12:15 AM		53.6	55.7	54.65	Integrated Environment Labor	
16.	01:15 AM		58.6	59.7	59.15	Integrated Environment Labor	
17.	02:15 AM		56.1	57.9	57	Integrated Environment Labor	
18.	03:15 AM		55.4	58	56.7	Integrated Environment Labor	
19.	04:15 AM		59.7	61.7	60.7	Integrated Environment Labor	
20.	05:15 AM		54.7	56.3	55.5	Integrated Environment Labor	
21.	06:15 AM		53.9	55.1	54.5	Integrated Environment Labor	
22.	07:15 AM		58.9	59.1	59	Integrated Environment Labor	
23.	08:15 AM		58.1	59.7	58.9	Integrated Environment Labor	
24.	09:15 AM		61.7	63.7	62.7	Integrated Environment Labor	
NEQS limit : 65 dB							
WHO limit: 70 dB							

NEQS: National Environmental Quality Standards WHO: World Health Organization

Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- Quality was assured through self calibration of the instrument.
- The values were representing of monitoring conditions prevailing during the monitoring hours.
- The measurements were carried out on client request.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5852913 Cell: +92 302 8462412 Email: inenvconsultants@yahoo.com www. iec-consultants.com

Integrated Environment Labor

Integrated Environment Labor

Integrated Environment Labor

Water Quality Analysis



WATER ANALYSIS REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, District		
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project.		Abbotabad, Kpk		
Sampling Date:	15-04-2021	Reporting Date:	23-04-2021		
Source:	Tap Water	Sampling Done by:	Analyst		
GPS Coordinates:	34° 7'26.82"N 73°11'23.31"E	Analysis Method:	APHA/USEPA Standard Methods		
Sr. No.	Parameters	Analysis Methods	Units	NDWQS	Results
1.	pH	APHA-4500H+ B	-	6.5-8.5	7.3
2.	Taste & Odor	In-house	-	Non Objectionable	Non Objectionable
3.	Color	APHA-2120 B/C	TCU	<15	6
4.	Turbidity	APHA-2130 B	NTU	<5	4
5.	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
6.	Total Coliform	APHA:9222 B	Number/100 MI	0 Number/100 mL	0
7.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	315
8.	Total Hardness	APHA-2340 C	mg/L	<500	165
9.	Nitrate	APHA-4500NO3 B	mg/L	≤50	2.8
10.	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.04
11.	Ammonia	APHA-4500-NH3-B	mg/L	----	N.D
12.	Arsenic	APHA-3500As B	mg/L	≤0.05	N.D
13.	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D
14.	Barium	APHA-3500Ba-B	mg/L	0.7	N.D
15.	Chloride	APHA-4500Cl- B	mg/L	<250	121
16.	Fluoride	APHA-4500F- C	mg/L	≤1.5	0.81
17.	Aluminum	APHA-3500 Al	mg/L	≤0.2	N.D
18.	Manganese	APHA-3500 MN-B	mg/L	≤0.5	N.D
19.	Mercury	APHA-3500 Hg-B	mg/L	≤0.001	N.D
20.	Iodine	-----	mg/L	-----	0.03
21.	Zinc	APHA- 3500 Zn B	mg/L	5.0	0.85
22.	Boron	APHA 4500 B- C	mg/L	0.3	N.D
23.	Chromium	APHA 3500 Cr B	mg/L	≤0.05	N.D
24.	Selenium	APHA- 3500 Se C	mg/L	0.01	N.D

NDWQS: National Drinking Water Quality Standards

Note:

- Selected measurement units were mg/l otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist:

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5852913 Cell: +92 302 8462112 Email: incoconsultants@yahoo.com www.inco-consultants.com



WATER ANALYSIS REPORT

Reference Number	KPCIP/ENV/59-2021	Site Address:	Landfill Site Salhad, District		
Project Name:	Khyber Pakhtunkhwa Cities Improvement Project.		Abbotabad, Kpk		
Sampling Date:	16-04-2021	Reporting Date:	23-04-2021		
Source:	Tap Water	Sampling Done by:	Analyst		
GPS Coordinates:	34° 7'27.88"N 73°11'14.36"E	Analysis Method:	APHA/USEPA Standard Methods		
Sr. No.	Parameter s	Analysis Methods	Units	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	7.6
2.	Taste & Odor	In-house	--	Non Objectionable	Non Objectionable
3.	Color	APHA-2120 B/C	TCU	<15	4
4.	Turbidity	APHA-2130 B	NTU	<5	3
5.	E-Coli	APHA:9222 D	Number/100 mL	0 Number/100 mL	0
6.	Total Coliform	APHA:9222 B	Number/100 ML	0 Number/100 mL	0
7.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	305
8.	Total Hardness	APHA-2340 C	mg/L	<500	189
9.	Nitrate	APHA-4500NO3 B	mg/L	≤50	2.56
10.	Nitrite	APHA-4500NO2 B	mg/L	≤3	0.31
11.	Ammonia	APHA-4500-NH3-B	mg/L	—	0.07
12.	Arsenic	APHA-3500As B	mg/L	≤0.05	N.D
13.	Antimony	APHA-3500Sb B	mg/L	<0.005	N.D
14.	Barium	APHA-3500Ba-B	mg/L	0.7	N.D
15.	Chloride	APHA-4500Cl- B	mg/L	<250	98
16.	Fluoride	APHA-4500F- C	mg/L	≤1.5	0.95
17.	Aluminum	APHA-3500 Al	mg/L	≤0.2	N.D
18.	Manganese	APHA-3500 MN-B	mg/L	≤0.5	N.D
19.	Mercury	APHA-3500 Hg-B	mg/L	≤0.001	N.D
20.	Iodine	-----	mg/L	-----	0.07
21.	Zinc	APHA- 3500 Zn B	mg/L	5.0	1.05
22.	Boron	APHA 4500 B- C	mg/L	0.3	0.001
23.	Chromium	APHA 3500 cr B	mg/L	≤0.05	N.D
24.	Selenium	APHA- 3500 Se C	mg/L	0.01	N.D

NDWQS: National Drinking Water Quality Standards

Note:

- Selected measurement units were mg/l otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
Signature of Analyst:*[Signature]*
Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Creative House, 3rd Floor, Office # 302, Phase III Chowk, Hayatabad, Peshawar, Pakistan
Tel: 091-5952012 Fax: +92 302 8462112 Email: info@consultants.com www.icee-consultants.com

Annexure E

Occupational Health and Safety Plan

General

Occupational Health and Safety covers all personnel working under the project and will be in line with the World Bank/IFC EHS guidelines on health and safety.

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects of those hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces.

Some of the risks/hazards associated with workplaces are due to working close to or at sites associated with the various project construction activities. Other risks associated with the project construction phase include risk of increase of vector borne and other different diseases.

The following sections will be implemented during the construction phase to address and ensure workers' health and safety.

a. Screening and regular unannounced checking of workers

As per the procedure for hiring workers, all contractors and labor agencies are required to make all prospective workers undergo medical tests to screen for diseases and sicknesses, prior to selection and employment of any worker. The contractor is also responsible for ensuring that no worker who has a criminal record is employed at the project site. It will be ensured that all workers undergo medical tests to screen diseases at source and at sites in consultation with the designated Health Officer.

In addition to this, the Project Management will also undertake sudden, unannounced checks on workers to look for diseases such as HIV, STDs, and hepatitis and take necessary steps as mandated by the Contractual agreement between the Contractor and the Worker(s).

b. Minimizing hazards and risks at the workplace.

To ensure safety at all work sites, the following will be carried out:

- i. Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful.
- ii. Construction of barricades around construction sites and deep excavated pits, to cordon off and deter entry of unauthorized personnel and workers into these areas.
- iii. Providing a safe storage site/area for large equipment such as power tools and chains, to prevent misuse and loss.
- iv. Proper Housekeeping: Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse. Brick stacks will not be more than 7 feet in height and for concrete blocks they will not be more than 6 feet high.
- v. Removing all scrap timber, waste material and rubbish from the immediate work area as the work progresses.

vi. Where scaffolds are required, ensuring that each scaffold or its components shall be capable of supporting its own weight and at least 4 times the maximum intended load applied or transmitted to it. The platform/scaffold plank shall be at least 15 inches wide and 1.5 inches thick. The rope should be capable of supporting at least 6 times the maximum intended load applied or transmitted to that rope. Pole scaffolds over 60 feet in height shall be designed by a registered professional engineer and shall be constructed and loaded in accordance with that design. Where scaffolds are not provided, safety belts/safety nets shall be provided;

vii. Ensure that all ramps or walkways are at least 6 feet wide, having slip resistance threads and not inclined at more than a slope of 1 vertical and 3 horizontals.

viii. Stacking away all excavated earth at least 2 feet from the pit to avoid material such as loose rocks from falling back into the excavated area and injuring those working inside excavated sites.

ix. Constructing support systems, such as bracing to adjoining structures that may be endangered by excavation works nearby.

x. Only a trained electrician to construct, install and repair all electrical equipment to prevent risks of electrical shocks and electrocution.

xi. Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.

c. Provision of Personal Protective Equipment

Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. This will be included in the construction cost for each Contractor. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment:

i. High visibility clothing for all personnel during road works must be mandatory.

ii. Helmet shall be provided to all workers, or visitors visiting the site, for protection of the head against impact or penetration of falling or flying objects.

iii. Safety belt shall be provided to workers working at heights (more than 20 ft.) such as roofing, painting, and plastering.

iv. Safety boots shall be provided to all workers for protection of feet from impact or penetration of falling objects on feet.

v. Ear protecting devices shall be provided to all workers and will be used during the occurrence of extensive noise.

vi. Eye and face protection equipment shall be provided to all welders to protect against sparks.

vii. Respiratory protection devices shall be provided to all workers during occurrence of fumes, dusts, or toxic gas/vapor.

viii. Safety nets shall be provided when workplaces are more than 25 feet (7.5 m) above the ground or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors or safety belts is impractical.

The specific PPE requirements for each type of work are summarized below.

Table E.1 PPE Requirement List

Type of Work	PPE
Elevated work	Safety helmet, safety belt (height greater than 20 ft.), footwear for elevated work.
Handling work safety	Helmet, leather safety shoes, work gloves.
Welding and cutting work	Eye protectors, shield and helmet, protective gloves.
Grinding work	Dust respirator, earplugs, eye protectors.
Work involving handling of chemical substances	Dust respirator, gas mask, chemical-proof gloves. Chemical proof clothing, air-lined mask, eye protectors.
Wood working	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Blasting	Hard hat, eye and hearing protection.
Concrete and masonry work	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.
Excavation, heavy equipment, motor graders, and bulldozer operation	Hard hat, safety boots, gloves, hearing protection.
Quarries	Hard hat, eye protectors, hearing protection, safety footwear, leather gloves and dust respirator.

d. Procedures to Deal with Emergencies such as Accidents, Sudden Illness and Death of Workers

First aid kits will be made available at all times throughout the entire construction period by the respective contractors. This is very important, because most work sites will be at some distance from the nearest hospital. In addition to the first aid kits, the following measures shall be in place:

i. Provision of dispensaries by the individual EPC contractor.

ii. A vehicle shall be on standby from the Project Office so that emergency transportation can be arranged to take severely injured/sick workers to the nearest hospital for immediate medical attention.

iii. A designated Health Officer/worker for the Project will be identified as a focal person to attend to all health and safety related issues. This employee's contact number will be posted at all work sites for speedy delivery of emergency services. The focal person shall be well versed with the medical system and facilities available at the hospital.

iv. Communication arrangements, such a provision of radios or mobile communication for all work sites, for efficient handling of emergencies, will be made.

e. Record Maintenance and Remedial action

The Project Management will maintain a record of all accidents and injuries that occur at the work site. This work will be delegated by the contractor to the site supervisor and regularly reviewed every quarter by project management. Reports prepared by the contractor shall include information on the place, date and time of the incident, name of persons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigate actions to change any unsafe or harmful conditions.

f. Compensation for Injuries and Death

Any casualty or injury resulting from occupational activities shall be compensated as per the local labor laws. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

g. Awareness Programs

The Project management will undertake awareness programs through posters, talks, and meetings with the contractors to undertake the following activities:

i. Dissemination sessions will clarify the rights and responsibilities of the workers regarding interactions with local people (including communicable disease risks, such as HIV/AIDS), work site health and safety, waste management (waste separation, recycling, and composting), and the illegality of poaching.

ii. Make workers aware of procedures to be followed in case of emergencies such as informing the focal health person who in turn will arrange the necessary emergency transportation or treatment.

h. Nomination of a Health and Safety Focal Person

Within each site (especially if different sites are being implemented by different contractors), a Health and Safety Focal Person will be appointed. The Terms of Reference for the focal person will mainly be as follows:

- i. Function as the focal person/representative for all health and safety matters at the workplace;
- ii. Responsible for maintaining records of all accidents and all health and safety issues at each site, the number of accidents and its cause, actions taken and remedial measures undertaken in case of safety issues;
- iii. Be the link between the contractor and all workers and submit grievances of the workers to the contractor and instructions/directives on proper health care and safety from the contractors back to the workers;
- iv. Ensure that all workers are adequately informed on the requirement to use Personal Protective Equipment and its correct use;
- v. Also responsible for the first aid kit and making sure that the basic immediate medicines are readily available.

Annexure F

Emergency Response Plan

F.1 PURPOSE

The purpose of this Emergency Response Procedure is to provide measures and guidance for the establishment and implementation of emergency preparedness plans for the project. The aim of the Emergency Response Procedure is to:

- (i) Ensure all personnel and visitors to the office/job sites are given the maximum protection from unforeseen events.
- (ii) Ensure all personnel are aware of the importance of this procedure to protection of life and property.

F.2 EMERGENCY PREPARATION AND RESPONSE MEASURE SCOPE

The emergency management program is applied to all Project elements and intended for use throughout the Project life cycle. The following are some emergencies that may require coordinated response.

- (i) Construction Accident
- (ii) Road & Traffic Accident
- (iii) Hazardous material spills
- (iv) Structure collapse or failure
- (v) Trauma or serious illness
- (vi) Sabotage
- (vii) Fire
- (viii) Environmental Pollution
- (ix) Loss of person
- (x) Community Accident

F.3 RESPONSIBILITIES

The detailed roles and responsibilities of certain key members of the Emergency Response team available to assist in emergency are provided in **Table F.1** below.

Table F.1 Emergency Response Team

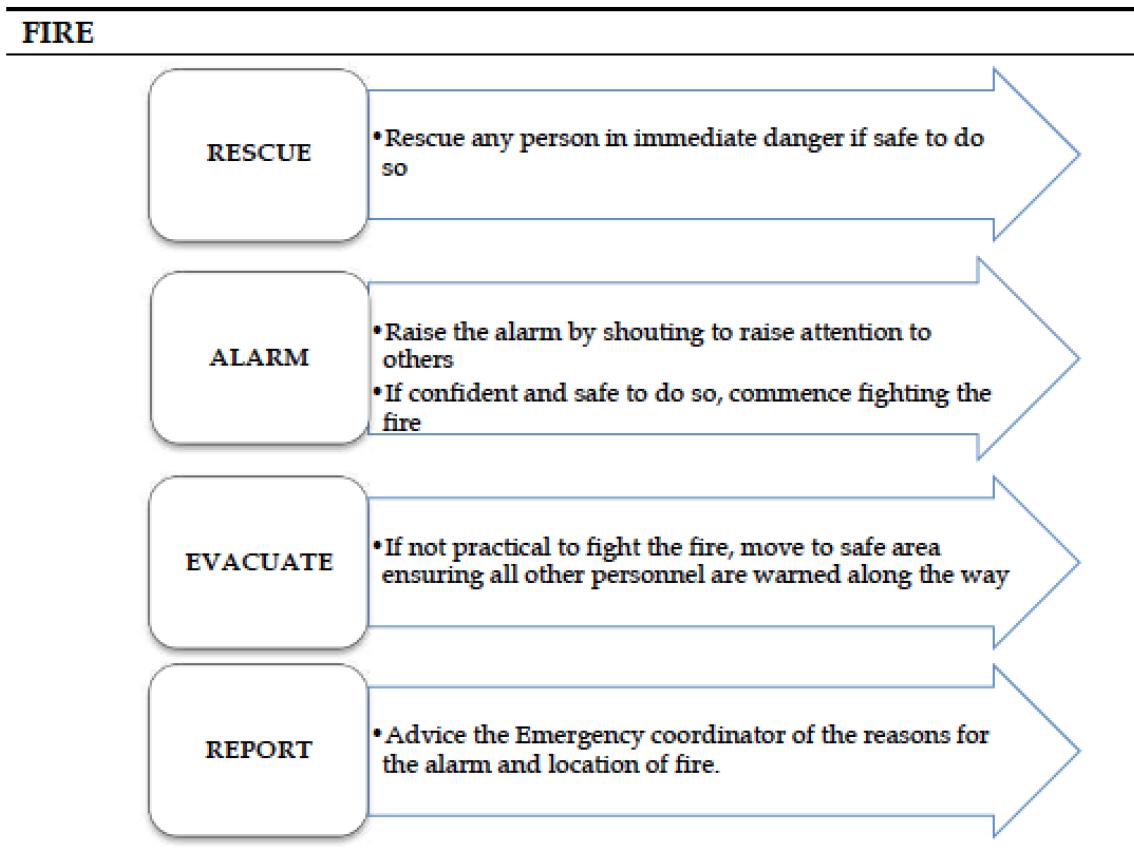
Action Group	Responsibility
Emergency Coordinator	<p>Overall control of personnel and resources.</p> <p>The Emergency Coordinator will support and advise the Site Safety Supervision as necessary.</p> <p>Serves as public relations spokes persons, or delegates to some staff member the responsibility for working with news media regarding any disaster or emergency. Also assure proper coordination of news release with appropriate corporate staff or other designated people.</p>
Site Safety Supervision (Emergency Commander)	<p>Overall responsibility for activating emergency plan and for terminating emergency actions.</p> <p>Be alternative of emergency response chairpersons.</p> <p>Disseminates warnings and information as required to ensure all people in the immediate area have been warned and evacuated either by alarms or by word of mouth.</p> <p>Supervise the actions of the Emergency Response Team to ensure all persons are safe from the danger.</p> <p>Notify outside authorities if assistance is required.</p> <p>Carries the responsibility for coordinating actions including other organizations in accordance with the needs of the situation.</p> <p>Ensure maximum co-operation and assistance is provided to any outside groups called to respond to an emergency.</p> <p>Establish and appoint all emergency organization structure and team.</p> <p>Assures adequate delegation of responsibilities for all key positions of assistants on the Project to assist with any foreseeable emergency.</p> <p>Ensure resources available to purchase needed emergency response equipment and supplies.</p> <p>Assures that all persons on the Emergency Response Team aware and fully understand their individual responsibilities for implementing and supporting the emergency plan.</p> <p>Establish the emergency drill schedule of all identified emergency scenarios, track the status and evaluate the emergency.</p>

Action Group	Responsibility
	The Emergency Commander shall ensure that senior management personnel have been reported of the emergency as soon as practical after the event.
Security Team	<p>Ensure that the exit route is regularly tested and maintained in good working order.</p> <p>Maintain station at the security gate or most suitable location to secure the area during any emergency such that only authorized personnel and equipment may enter, prevent access to the site of unauthorized personnel.</p> <p>Assist with strong/activation of services during an emergency.</p> <p>Ensure vehicles and obstructions are moved to give incoming emergency vehicles access to the scene, if ambulance or emergency services are attending the site, ensure clear access and personnel are located to direct any incoming emergency service to the site of emergency.</p>
Rescue & Medical Team	<p>Protect the injured from further danger and weather.</p> <p>Provide treatment to the victim(s) to the best of their ability by first aid and then transfer to hospital.</p> <p>Remain familiar with the rescue activities and rescue apparatus.</p> <p>Assist outside medical services personnel when they arrive</p>
General Administration Team	Response to support any requested general facilities for assisting Emergency Response Team in their work.
Government Relation Team	<p>Coordinate with local government on a matter of concerned in the emergency response plan to liaise with local officers in their affair for support Emergency Response Team.</p> <p>Coordinate emergency plan with the government authorities, local community.</p>
Environment Team	In case of emergency related to the environmental pollution such as the chemical spill, oil spill into the ambient, the environment team will support the technical advice to control and mitigate the pollution until return to the normal situation.
Department Heads	Call up of personnel into the safe location for protective life and property.

Action Group	Responsibility
	<p>Take immediate and appropriate action while Emergency Response Team is being mobilized.</p> <p>Keep in touch with the Emergency Commander</p> <p>Control and supervise operators and contractors on the implementation of this procedure, with consultation with Safety Team as necessary.</p> <p>Provide and maintain emergency equipment of their responsible areas.</p>
Other Staff and Employees	<p>All other staff and employees will remain at their workstations or assembly point unless directed otherwise from Emergency Response Team.</p> <p>Each supervisor will ensure that all members of his work group are accounted for and keep in touch with each of their Department Head.</p>

F.4 PROCEDURE

Emergency situation and injuries to person can occur at any time or place either on Project site or elsewhere. The most two common types of emergencies on site are fire and serious accident.

Figure F.1 Emergency Procedure for FireFig
—
A

take the following action:

- If a hazard exists consider your own safety then if possible remove the hazard or the injured person.
- Assess the patient by checking for Airway, Breathing, Pulse and obvious
- Report directly to First Aid or Security Centers, when raising the alarm you must clearly give the following information;
 - Your name and the detail of accident
 - The location of the injured person(s)
 - The number of persons injured
 - The extent of the injuries, if known
 - What known hazards are in the area
- Make the injured person as comfortable as possible
- Treat the obvious injuries
- Reassure the injured person

F.5 COMMUNICATION WITH AUTHORITIES / PRESS AT SITE

In the event of an accident or incident, only senior staff is permitted to give factual information to the authorities for resource of liability exposure. The press must be avoiding politely, at all costs, with the terse comment that “the matter is under investigation and relevant information when available will be provided by our Head Office” Do not ever give your opinion or story.

First Aid Persons

Upon advice of medical emergency, make immediate assessment to response required and if necessary, advise security to summon ambulance or medical assistance, the qualified first aid attendant shall also,

Provide treatment to the victim(s) to the best of his/her ability.

Ensure the safety of victims by ceasing any work activity in the area.

Protect the injured from further danger and weather.

Assist medical services personnel when they arrive.

General Administration Team

Upon advice of medical emergency, maintain contact with first aid personnel and summon ambulance if required.

Security Team

If ambulance or emergency services are attending the site, ensure clear access and personnel are located to direct vehicle closest to the scene.

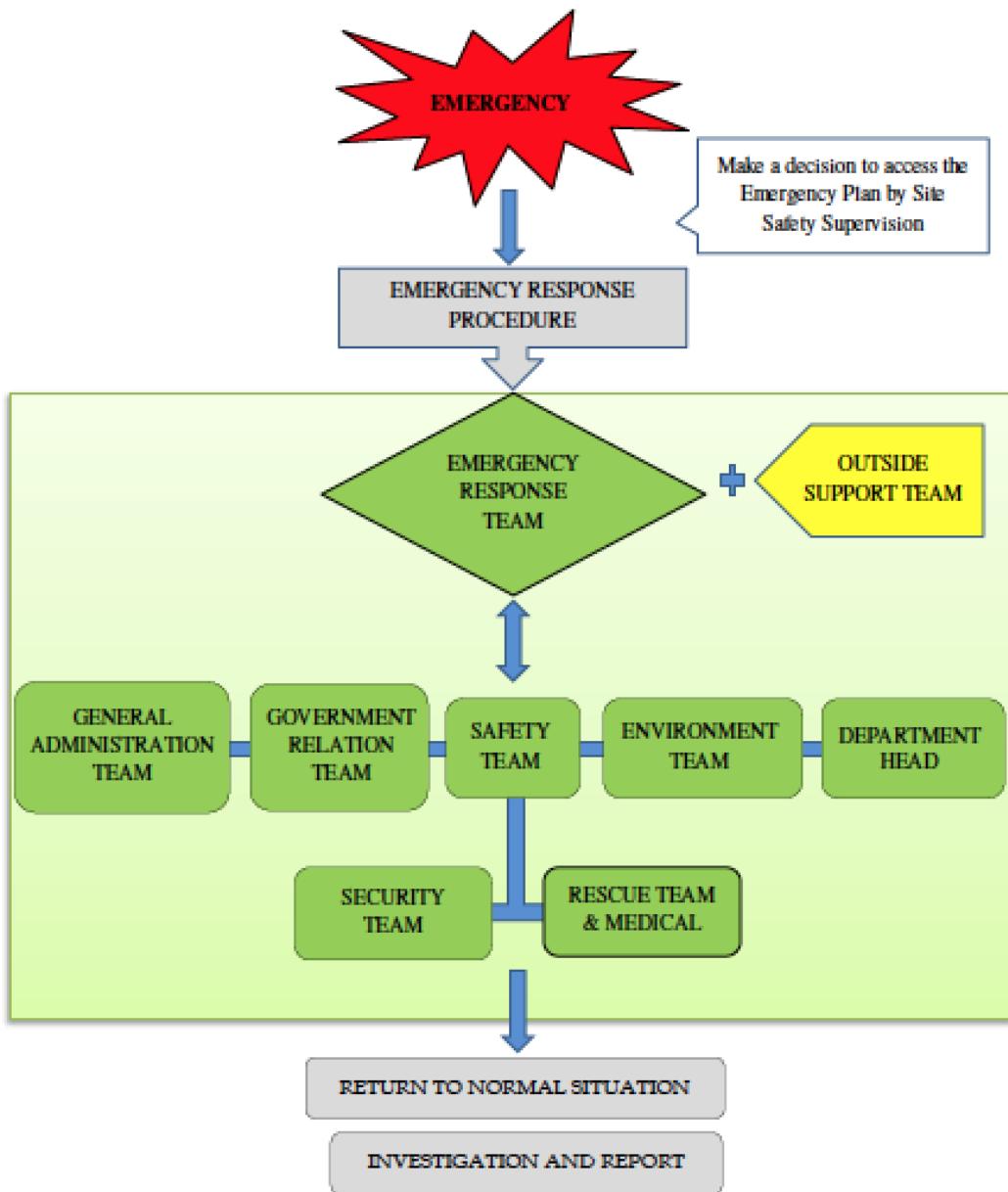
Prevent access to the site of unauthorized personnel (press, etc.).

Emergency Coordinator

The Emergency Coordinator shall assist emergency personnel at the scene as required through allocation of company resources.

The Emergency Coordinator shall ensure next-of-kin are properly notified as soon as possible and give whatever company support and assistance is necessary to assist them bundle the situation

The Emergency Coordinator shall ensure that senior management personnel are advised of the emergency as soon as practical after the event.



Note: Name of contact person and call number from Owner/ Contractor to be determined.

F.5 INCIDENT AND ACCIDENT REPORT

Section A: Identification Data								
Report No:	Date of Reported:			Reporter:	Sign:			
Job Title:			Company Name:					
Section B: Violence Rate								
Accident Violence: <input type="checkbox"/> 01-Death <input type="checkbox"/> 02-Serious Injury <input type="checkbox"/> 03-Lost Time Injury <input type="checkbox"/> 04-First Aid <input type="checkbox"/> 05- Not Injury <input type="checkbox"/> 06-Near Miss								
Property Damage Cost: <input type="checkbox"/> 1-2,000 USD <input type="checkbox"/> 2,001-10,000 USD <input type="checkbox"/> 10,001-50,000 <input type="checkbox"/> > 50,001								
Section C: Environmental Impact								
Affected area	<input type="checkbox"/> Construction area	<input type="checkbox"/> Public area						
Receptor	<input type="checkbox"/> None	<input type="checkbox"/> Workers	<input type="checkbox"/> Community					
Type of pollution	<input type="checkbox"/> Physical	<input type="checkbox"/> Chemical	<input type="checkbox"/> Biological					
Toxicity	<input type="checkbox"/> Non-toxic	<input type="checkbox"/> Low - toxic	<input type="checkbox"/> High - toxic					
Return to Normal	<input type="checkbox"/> 1 day	<input type="checkbox"/> 1 day to 1 week	<input type="checkbox"/> ≥ 1 week					
Cumulative impact	<input type="checkbox"/> Non-cumulative	<input type="checkbox"/> Cumulative						
Section D: Injured/Illness Employee								
1.Name:		Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female	Date of Birth:		Age:	Regular Job Title:	Experience:	
			Month	Day			Year	In this job title
Site:		Company:	Reference:			Phone No:	Social Security Number	
Part of Body Injured or Affected:				Nature of Injury or Illness:				
<input type="checkbox"/> Head <input type="checkbox"/> Hands <input type="checkbox"/> Face <input type="checkbox"/> Nose <input type="checkbox"/> Eyes <input type="checkbox"/> Legs <input type="checkbox"/> Teeth <input type="checkbox"/> Neck <input type="checkbox"/> Trunk <input type="checkbox"/> Toes <input type="checkbox"/> Elbow <input type="checkbox"/> Shoulder <input type="checkbox"/> Back <input type="checkbox"/> Ankle <input type="checkbox"/> Wrist <input type="checkbox"/> Foot <input type="checkbox"/> Arms <input type="checkbox"/> Thump <input type="checkbox"/> Fingers <input type="checkbox"/> Internal				<input type="checkbox"/> Laceration <input type="checkbox"/> Amputation <input type="checkbox"/> Puncture <input type="checkbox"/> Fracture <input type="checkbox"/> Strain & Sprain <input type="checkbox"/> Burns <input type="checkbox"/> Contusion <input type="checkbox"/> Dry Heat Friction <input type="checkbox"/> Hemia <input type="checkbox"/> Foreign Body <input type="checkbox"/> Chemical <input type="checkbox"/> Contamination <input type="checkbox"/> Skin (Occupational) <input type="checkbox"/> Rash <input type="checkbox"/> Irritation				
Remark:				Remark:				
2.Name:		Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female	Date of Birth:		Age:	Regular Job Title:	Experience:	
			Month	Day			Year	In this job title
Site:		Company:	Reference:			Phone No:	Social Security Number	
Part of Body Injured or Affected:				Nature of Injury or Illness:				
<input type="checkbox"/> Head <input type="checkbox"/> Hands <input type="checkbox"/> Face <input type="checkbox"/> Nose <input type="checkbox"/> Eyes <input type="checkbox"/> Legs <input type="checkbox"/> Teeth <input type="checkbox"/> Neck <input type="checkbox"/> Trunk <input type="checkbox"/> Toes <input type="checkbox"/> Elbow <input type="checkbox"/> Shoulder <input type="checkbox"/> Back <input type="checkbox"/> Ankle <input type="checkbox"/> Wrist <input type="checkbox"/> Foot <input type="checkbox"/> Arms <input type="checkbox"/> Thump <input type="checkbox"/> Fingers <input type="checkbox"/> Internal				<input type="checkbox"/> Laceration <input type="checkbox"/> Amputation <input type="checkbox"/> Puncture <input type="checkbox"/> Fracture <input type="checkbox"/> Strain & Sprain <input type="checkbox"/> Burns <input type="checkbox"/> Contusion <input type="checkbox"/> Dry Heat Friction <input type="checkbox"/> Hemia <input type="checkbox"/> Foreign Body <input type="checkbox"/> Contamination <input type="checkbox"/> Chemical <input type="checkbox"/> Skin (Occupational) <input type="checkbox"/> Rash <input type="checkbox"/> Irritation				
Remark:				Remark:				
Section E: Accidents/Incident Details								
Date Accident/Incident Occurred:		Time Accident/Incident Occurred:			Exact Location of the Accident / Incident:			

Details of the actual Job Being done at the time:																							
Details of Accident/Incident/ What actually happened?																							
Section F: Accident Cause (Basic cause mark X / Contributing cause, if any mark O) <table border="0"> <tr> <th>UNSAFE CONDITIONS</th> <th>UNSAFE ACTS</th> </tr> <tr> <td>1 <input type="checkbox"/> Inadequately Guarded</td> <td>1 <input type="checkbox"/> Operating Without Authority / Training</td> </tr> <tr> <td>2 <input type="checkbox"/> Unguarded</td> <td>2 <input type="checkbox"/> Operating at Unsafe Speed</td> </tr> <tr> <td>3 <input type="checkbox"/> Defective Tools, Equipment, or Substance</td> <td>3 <input type="checkbox"/> Making SHE Device Inoperative</td> </tr> <tr> <td>4 <input type="checkbox"/> Unsafe Design or Construction</td> <td>4 <input type="checkbox"/> Using Unsafe Equipment or Equipment Unsaferly</td> </tr> <tr> <td>5 <input type="checkbox"/> Hazardous Arrangement</td> <td>5 <input type="checkbox"/> Unsafe Loading, Placing, Mixing</td> </tr> <tr> <td>6 <input type="checkbox"/> Unsafe Illumination</td> <td>6 <input type="checkbox"/> Taking Unsafe Position</td> </tr> <tr> <td>7 <input type="checkbox"/> Unsafe Ventilation</td> <td>7 <input type="checkbox"/> Working on Moving or Dangerous Equipment</td> </tr> <tr> <td>8 <input type="checkbox"/> Unsafe Clothing</td> <td>8 <input type="checkbox"/> Distraction, Teasing, Horse Play</td> </tr> <tr> <td>9 <input type="checkbox"/> Insufficient Instruction</td> <td>9 <input type="checkbox"/> Failure to use Personal Protective Devices</td> </tr> <tr> <td>10 <input type="checkbox"/> Lack of system of work</td> <td>10 <input type="checkbox"/> Lack of effective instruction or supervision</td> </tr> </table> <p>Why was the unsafe act committed? _____ Why did the unsafe condition exist? _____</p>		UNSAFE CONDITIONS	UNSAFE ACTS	1 <input type="checkbox"/> Inadequately Guarded	1 <input type="checkbox"/> Operating Without Authority / Training	2 <input type="checkbox"/> Unguarded	2 <input type="checkbox"/> Operating at Unsafe Speed	3 <input type="checkbox"/> Defective Tools, Equipment, or Substance	3 <input type="checkbox"/> Making SHE Device Inoperative	4 <input type="checkbox"/> Unsafe Design or Construction	4 <input type="checkbox"/> Using Unsafe Equipment or Equipment Unsaferly	5 <input type="checkbox"/> Hazardous Arrangement	5 <input type="checkbox"/> Unsafe Loading, Placing, Mixing	6 <input type="checkbox"/> Unsafe Illumination	6 <input type="checkbox"/> Taking Unsafe Position	7 <input type="checkbox"/> Unsafe Ventilation	7 <input type="checkbox"/> Working on Moving or Dangerous Equipment	8 <input type="checkbox"/> Unsafe Clothing	8 <input type="checkbox"/> Distraction, Teasing, Horse Play	9 <input type="checkbox"/> Insufficient Instruction	9 <input type="checkbox"/> Failure to use Personal Protective Devices	10 <input type="checkbox"/> Lack of system of work	10 <input type="checkbox"/> Lack of effective instruction or supervision
UNSAFE CONDITIONS	UNSAFE ACTS																						
1 <input type="checkbox"/> Inadequately Guarded	1 <input type="checkbox"/> Operating Without Authority / Training																						
2 <input type="checkbox"/> Unguarded	2 <input type="checkbox"/> Operating at Unsafe Speed																						
3 <input type="checkbox"/> Defective Tools, Equipment, or Substance	3 <input type="checkbox"/> Making SHE Device Inoperative																						
4 <input type="checkbox"/> Unsafe Design or Construction	4 <input type="checkbox"/> Using Unsafe Equipment or Equipment Unsaferly																						
5 <input type="checkbox"/> Hazardous Arrangement	5 <input type="checkbox"/> Unsafe Loading, Placing, Mixing																						
6 <input type="checkbox"/> Unsafe Illumination	6 <input type="checkbox"/> Taking Unsafe Position																						
7 <input type="checkbox"/> Unsafe Ventilation	7 <input type="checkbox"/> Working on Moving or Dangerous Equipment																						
8 <input type="checkbox"/> Unsafe Clothing	8 <input type="checkbox"/> Distraction, Teasing, Horse Play																						
9 <input type="checkbox"/> Insufficient Instruction	9 <input type="checkbox"/> Failure to use Personal Protective Devices																						
10 <input type="checkbox"/> Lack of system of work	10 <input type="checkbox"/> Lack of effective instruction or supervision																						
Section G: Guide to Corrective Action (Base on the cause checked above, I am taking the following corrective action) <table border="0"> <thead> <tr> <th>UNSAFE ACT</th> <th>UNSAFE CONDITION</th> <th>If Supervisor can't handle, then recommend to</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Stop the Behaviour</td> <td><input type="checkbox"/> Remove</td> <td><input type="checkbox"/> Site Engineer, or</td> </tr> <tr> <td><input type="checkbox"/> Study the job</td> <td><input type="checkbox"/> Guard</td> <td><input type="checkbox"/> Site Manager, or</td> </tr> <tr> <td><input type="checkbox"/> Instruct (tell-show-try-check)</td> <td><input type="checkbox"/> Warn</td> <td><input type="checkbox"/> Project Manager, or</td> </tr> <tr> <td><input type="checkbox"/> Follow Up</td> <td><input type="checkbox"/> Supervisory Training</td> <td><input type="checkbox"/> Safety Committee</td> </tr> <tr> <td><input type="checkbox"/> Enforce</td> <td></td> <td></td> </tr> </tbody> </table> <p>Detail below any immediate remedial actions that have been taken:</p>		UNSAFE ACT	UNSAFE CONDITION	If Supervisor can't handle, then recommend to	<input type="checkbox"/> Stop the Behaviour	<input type="checkbox"/> Remove	<input type="checkbox"/> Site Engineer, or	<input type="checkbox"/> Study the job	<input type="checkbox"/> Guard	<input type="checkbox"/> Site Manager, or	<input type="checkbox"/> Instruct (tell-show-try-check)	<input type="checkbox"/> Warn	<input type="checkbox"/> Project Manager, or	<input type="checkbox"/> Follow Up	<input type="checkbox"/> Supervisory Training	<input type="checkbox"/> Safety Committee	<input type="checkbox"/> Enforce						
UNSAFE ACT	UNSAFE CONDITION	If Supervisor can't handle, then recommend to																					
<input type="checkbox"/> Stop the Behaviour	<input type="checkbox"/> Remove	<input type="checkbox"/> Site Engineer, or																					
<input type="checkbox"/> Study the job	<input type="checkbox"/> Guard	<input type="checkbox"/> Site Manager, or																					
<input type="checkbox"/> Instruct (tell-show-try-check)	<input type="checkbox"/> Warn	<input type="checkbox"/> Project Manager, or																					
<input type="checkbox"/> Follow Up	<input type="checkbox"/> Supervisory Training	<input type="checkbox"/> Safety Committee																					
<input type="checkbox"/> Enforce																							
<p>Detail below any corrective and preventative actions that could be taken to prevent future re-occurrence:</p>																							
	Responsible	Completion Date																					

Section H: Witness Statement			
Witness Name		Interviewer Name	
Section I: Reviewed & Recommend by			
Recommendation:			
Reviewed By:	Position:	Signature:	Date:
Remarks : If Accident or Incident happened with lost time injury and affected to the publicity must further report to Safety Department; : First Aid Cases will not applicable to this form; : The accident report shall submit to Safety Department within 3 days : Attached the photograph or sketch the location of accident / incident;			

Annexure G

Archaeological ‘Chance Find’ procedure

Background

The purpose of this document is to address the possibility of archaeological deposits becoming exposed during ground altering activities within the project area and to provide protocols to follow in the case of a chance archaeological find to ensure that archaeological sites are documented and protected as required.

Archaeological sites are an important resource that is protected for their historical, cultural, scientific and educational value to the general public and local communities. Impacts to archaeological sites must be avoided or managed by development proponents. The objectives of this ‘Archaeological Chance Find Procedure’ are to promote preservation of archaeological data while minimizing disruption of construction scheduling/ It is recommended that due to the moderate to high archaeological potential of some areas within the project area, all on site personnel and contractors be informed of the Archaeological Chance Find Procedure and have access to a copy while on site.

Potential Impacts to Archaeological Sites

Developments that involve excavation, movement, or disturbance of soils have the potential to impact archaeological materials, if present. Activities such as road construction, land clearing, and excavation are all examples of activities that may adversely affect archaeological deposits.

Archaeological ‘Chance Find’ Procedure

If you believe that you may have encountered any archaeological materials, stop work in the area and follow the procedure below:

The following ‘chance-find’ principles will be implemented by the contractor throughout the construction works to account for any undiscovered items identified during construction works:

- (i) Workers will be trained in the location of heritage zones within the construction area and in the identification of potential items of heritage significance.
- (ii) Should any potential items be located, the site supervisor will be immediately contacted and work will be temporarily stopped in that area.
- (iii) If the site supervisor determines that the item is of potential significance, an officer from the department of Archaeology (DoA) will be invited to inspect the site and work will be stopped until DoA has responded to this invitation.
- (iv) Work will not re-commence in this location until agreement has been reached between DoA and proponent as to any required mitigation measures, which may include excavation and recovery of the item.
- (v) A precautionary approach will be adopted in the application of these procedures.

Detailed Procedural Steps

If the Director, department of Archaeology receives any information or otherwise has the knowledge of the discovery or existence of an antiquity of which there is no owner, he shall, after satisfying himself as to the correctness of the information or knowledge, take such steps with the

approval of the Government, as he may consider necessary for the custody, preservation and protection of the antiquity.

Whoever discovers, or finds accidentally, any movable antiquity shall inform forth with the Directorate within seven days of its being discovered or found.

If, within seven days of his being informed, the Director decides to take over the antiquity for purposes of custody, preservation and protection, the person discovering or finding it shall hand it over to the Director or a person authorized by him in writing.

Where the Director decides to take over an antiquity, he may pay to the person by whom it is handed over to him such cash reward as may be decided in consultation with the Advisory Committee.

The Director or any officer authorized by him with police assistance may, after giving reasonable notice, enter into, inspect and examine any premises, place or area which or the sub-soil of which he may have reason to believe to be, or to contain an antiquity and may cause any site, building, object or any antiquity or the remains of any antiquity in such premises, place or area to be photographed, copied or reproduced by any process suitable for the purpose.

The owner or occupier of the premises, place or area shall afford all reasonable opportunity and assistance to the Director.

No photograph, copy or reproduction taken or made shall be sold or offered for sale except by or with the consent of the owner of the object of which the photograph, copy or the reproduction has been taken or made.

Where substantial damage is caused to any property as a result of the inspection, the Director shall pay to the owner thereof reasonable compensation for the damage in consultation with the Advisory Committee.

If the Director after conducting an inquiry, has reasonable grounds to believe that any land contains any antiquity, he may approach the Government to direct the Revenue Department to acquire such land or any part thereof and the Revenue Department shall thereupon acquire such land or part as for a public purpose.

Annexure H

Dust Management Plan

General

The purpose of this plan is to describe the measures that the project shall take to ensure that the risk of emissions from dust generated by site operations during construction are minimized and that best practice measures are implemented.

Dust emissions from construction can cause ill health effects to Contractor staff along with nuisance and annoyance to members of the local community. Dust will be controlled through:

- Elimination
- Reduction/Minimization
- Control

This dust management plan shall be implemented based on the measures already provided in the Environmental Management Plan (EMP) relating to controlling dust emissions.

Methodology

The following methodology will be undertaken for each project section:

Step 1 – Identify the dust generating activities

Construction activities that are likely to produce dust will be identified. The activities that will be taken into account are:

Haulage Routes, Vehicles and Asphalt/Concrete Batching Plant

Roads, surfaces and public highways

Static and mobile combustion plant emissions

Tarmac laying, bitumen surfacing and coating

Materials Handling, Storage, Spillage and Disposal

Storage of material

Stockpiles

Spillages

Storage of Waste

Site Preparation and Restoration after Completion

Earthworks, excavation and digging

Storage of spoil and topsoil

Demolition

Construction and Fabrication Processes

Step 2 – Identify Sensitive Receptors

Sensitive receptors have already been identified. The nature and location of the sensitive receptors will be taken into account when implementing control measures.

Step 3 – Implement Best Practice Measures to Control
Based on the nature of the activity producing the dust, the likelihood of dust being produced and the possible consequence of dust based on the sensitive receptors, the most effective control measure will be identified and implemented.

Step 4 – Monitor effectiveness of control

Construction Supervision Staff (CSC) will have the responsibility to ensure that dust control measures are being implemented and are effective.

Step 5 – Record and report result of monitoring

All inspections, audits and results of monitoring will be recorded and kept as part of the site filing system.

Method Statements and Risk Assessments

The Contractor's Risk Assessments and Method Statements will be required to be approved by the CSC prior to commencing work and will be required to contain environmental aspects of the task, including dust control measures where required.

Where dust has been identified within the risk assessment as a significant issue, the method statement will be required to cover the following:

Methods and materials that will be used to ensure that dust generation is minimized.

The use of pre-fabricated materials where possible.

Optimum site layout:

Dust generating activities to be conducted away from sensitive receptors

Supply of water for damping down.

Good housekeeping and management

All employees will be briefed on the Risk Assessment and Method Statement before starting work.

Training

All Contractor staff will be required to attend training seminars as already mentioned in the EMP document. A site-specific induction will also be required before being allowed to work on site. These will include site-specific sensitive receptors and details regarding dust control measures to be taken.

Toolbox talks on air pollution and minimizing dust emissions will be provided on a regular basis to Contractor staff.

Identification of Dust Generating Sources and Control Methods

Haulage Routes, Vehicles and Asphalt/Concrete Batching Plant	
Dust Source	Dust Control Methods
Major haul roads and traffic routes	Haul roads will be dampened down via a mobile bowser, as required.
Public Roads	Road sweeper will be used to clean public roads as required.
Site traffic management	Site traffic will be restricted to constructed access roads as far as possible. Site speed limit will be set at 10 mph as this will minimize the production of dust.
Road Cleaning	A mechanical road sweeper will be readily available and used.
Handling, Storage, Stockpiling and Spillage of Dusty materials	
Material handling operations	The number of times a material will have to be handled will be kept to a minimum to prevent double handling and ensure dusty materials are not handled unnecessarily.
Transport of fine dusty materials and aggregates.	Closed tankers will be used or sheeted vehicles.
Vehicle loading/unloading materials on to vehicles and conveyors.	Dusty materials will be dampened down Drop heights will be kept to a minimum and enclosed where possible.
Storage of Materials	
Bulk cement, bentonite etc.	Bentonite will be delivered in tankers and stored in dedicated enclosed areas. Bulk cement will be transported through tractor trollies or trailers.
Fine dry materials	These will be protected from the weather and by storing in appropriate containers and indoors, where necessary.
Storage location	Material will be stored in dedicated lay-down areas.

Storage of Stockpiles	
Stockpile location	Stockpiles will be placed so as to minimize double handling and facilitate the site restoration.
Building stockpiles	Stockpiles, tips and mounds will not be stored at an angle greater than an angle of repose of the material.
Small and temporary stockpiles	<p>Where possible, stockpiles will be placed under sheeting.</p> <p>Dusty material will be damped down.</p> <p>Wind barriers (protective fences) of a similar height to the stockpile will be erected, if required.</p>
Large and long term stockpiles	<p>Long-term stockpiles will be vegetated and stabilized as soon as possible.</p> <p>Stock piles will be dampened down until stabilized, where necessary.</p> <p>Wind barriers (protective fences) of a similar height to the stockpile will be erected, if required.</p>
Waste Material from Construction	
Disposal method	<p>A dedicated lay-down area will be available for waste.</p> <p>Waste will not be allowed to build up and will be disposed off at the designated locations as per EMP.</p>
Site Preparation and Restoration	
Earthworks, excavation and digging	These activity areas will be kept damp where required and if possible, will be avoided during dry and windy periods.
Completed earthworks	Surfaces will be stabilized by re-vegetation as soon as possible, where applicable.
Construction and Fabrication Process	
Crushing of material for reuse, transportation and disposal	Authorization will be obtained from PMU and ADB before using any mobile plant on site for activities such as crushing and screening.

	Any crushing or screening activities will be located away from sensitive receptors.
Cutting, grinding, drilling, sawing, trimming, planning, sanding	These activities will be avoided wherever possible. Equipment and techniques that minimize dust will be implemented. Water will be used to minimize dust.
Cutting roadways, pavements, blocks	Water sprinkling to be used.
Angle grinders and disk cutters	Best practice measures will be used such as dust extraction.

Monitoring Arrangements

Monitoring will be conducted at sensitive receptor locations in the project area as provided in the EMP. Furthermore, at locations where PM levels are exceeding applicable guidelines, additional stringent measures will be implemented at the respective location(s) in the project area to ensure dust levels are controlled as far as possible.

ANNEXURE I

Site Specific EMP (SSEMP) Guide & Template for Guidance to Contractor

Guide for Development of SSEMP

- Step 1: Define Boundaries
- Step 2: Identify Sensitive Receptors
- Step 3: Specify construction activities
- Step 4: Conduct Risk Assessment
- Step 5: Assign Environment Management measures
- Step 6: Prepare Site Plans
- Step 7: Prepare Environment Work Plans (if required)
- Step 8: Monitoring

Step 1: The project area needs to be clearly defined.

Step 2: The mapping of sensitive receptors has already been conducted and needs to be presented clearly in a map.

Step 3: The tentative construction activities to be conducted are as follows:

Site Surveying and Vegetation (Trees and plants) Clearance

Establishment of Work Camp, Batching and Asphalt plant and access roads

Dismantling of Asphalt and existing structures including Utilities

Preparation of ground for Asphalting

Asphalting

Landscaping

Step 4: The Risk Assessment matrix template is provided in the table below.

Risk is assessed as the likelihood that the activity will have an effect on the environment as well as the consequence of the effect occurring. It is often described like this:

Risk = Likelihood × Consequence

Likelihood Scale

Likelihood	Definition	Scale
Certain	Will certainly occur during the activity at a frequency greater than every week if preventative measures are not applied	5
Likely	Will occur more than once or twice during the activity but less than weekly if preventative measures are not applied	3
Unlikely	May occur once or twice during the activity if preventative measures are not applied	2
Rare	Unlikely to occur during the project	1

Consequence Scale

Consequence	Definition	Score
Catastrophic	The action will cause unprecedented damage or impacts on the environment or surrounding community e.g. extreme loss of soil and water resources and quality from storm water runoff extreme pollution of soil and water resources including major contamination from hazardous materials widespread effects on ecosystems with deaths of fauna/flora widespread community impacts resulting in illness, injury or inconvenience loss or destruction of archaeological or historical sites Occurrence will almost certainly result in the work being halted and a significant fine.	5
Major	The action will cause major adverse damage on the environment or surrounding communities e.g. major loss of soil and water resources and quality from storm water runoff major pollution of soil and water resources including contamination from hazardous materials significant effects on ecosystems with isolated deaths of non-vulnerable flora and fauna significant annoyance or nuisance to communities major damage to or movement required to archaeological or historical sites	3

Consequence	Definition	Score
	Occurrence may result in work being halted and a fine	
Moderate	<p>No or minimal adverse environmental or social impacts e.g.</p> <p>no measurable or noticeable changes in storm water quality. Water quality remains within tolerable limits</p> <p>little noticeable effect on ecosystems</p> <p>no or isolated community complaints</p> <p>no or unlikely damage to archaeological or historical sites</p> <p>no likelihood of being fined</p>	2
Minor	<p>No or minimal adverse environmental or social impacts e.g.</p> <p>no measurable or noticeable changes in storm water quality. Water quality remains within tolerable limits</p> <p>little noticeable effect on ecosystems</p> <p>no or isolated community complaints</p> <p>no or unlikely damage to archaeological or historical sites</p> <p>no likelihood of being fined</p>	1

Risk Score Table

Likelihood	Consequence				
		Catastrophic	Major	Moderate	Minor
Certain	25	15	10	5	
Likely	15	9	6	3	
Unlikely	10	6	4	2	
Rare	5	3	2	1	

Risk: Significant: 15-25

Medium: 6-10

Low 1-5

Any Medium to Significant risk requires an environmental management measure to manage the potential environmental risk. Judgement will be required concerning the application of an environmental management measure to mitigate low risk situations.

The higher the risk the more intensive the required mitigation measure will need to be; e.g. where site sedimentation is deemed to be low risk, then silt fences may be needed but as the risk increases, then sediment traps may be required. The selection of the appropriate mitigation measure will require judgment based on the level of risk and the specific site parameters.

Step 5: The Environmental Management measures are to be extracted from the IEE study for the project and should be added in the last column of the table below.

No.	Construction Activity	Hazards to Consider	Likelihood That the site or sensitive receptors will be affected?	Consequence of the site or sensitive receptors being affected?	Risk Score (consequence x likelihood)	Environmental Management Measures
i	Site Surveying & vegetation clearance	Damage to vegetation beyond project footprint				These can be taken from the EMP provided in the IEE report (If Risk Score is 6 or more)
		Erosion of exposed areas and sediment				
		Loss of topsoil				
		Dust generation				
		Noise				
ii	Establishment of Work Camp, Batching plant etc.	Soil deposited onto roads from tires				
		Stockpile erosion				
		Noise & Vibration				
		Traffic congestion				
		Fuel spills				

No.	Construction Activity	Hazards to Consider	Likelihood That the site or sensitive receptors will be affected?	Consequence of the site or sensitive receptors being affected?	Risk Score (consequence x likelihood)	Environmental Management Measures
iii	Dismantling of Asphalt and existing structures including Utilities	Noise and vibration				
		Dust generation				
		Community safety				
		Worker safety				
		Traffic Congestion				
iv	Preparation of Sub-Base	Noise and vibration				
		Dust generation				
		Traffic Congestion				
v	Asphalting	Noise and vibration				
		Dust generation				

No.	Construction Activity	Hazards to Consider	Likelihood That the site or sensitive receptors will be affected?	Consequence of the site or sensitive receptors being affected?	Risk Score (consequence x likelihood)	Environmental Management Measures
		Traffic Congestion				
		Community safety				
		Labor safety (PPEs)				
vi	Landscaping	Dust generation				
		Sediment runoff				
		Failure of vegetation to take root				
vii	Implementation of COVID-19 SOPs	Worker Health Risk				These can be taken from the EMP provided in the IEE report
		Public Health Risk				

Step 6: The Site plans are a critical part of the SSEMP and will need to be prepared, otherwise the ADB will consider the document as incomplete.

The site plan will need to provide the following:

Indication of North and scale

Existing and planned supporting infrastructure (e.g. access roads, water supplies and electricity supplies)

Location of planned work

Contours

Drainage systems

Locations of sensitive receptors

Step 7 (if required)²⁴: The completed SSEMP provides details of all the environmental management requirements for all stages of the construction process. For individual work teams who are responsible for only a small part of the overall construction works it can be confusing as to what is required for their particular work component. For example, the work team responsible for stripping soil for the construction areas are not going to be interested in the requirements for pouring concrete for footings and foundations. However, it is essential that the soil stripping team knows exactly what to clear and what to leave and where to put stockpiles of soil for later use.

In situations where different work activities are required at different times or at different locations, environmental work plans can be prepared. These are similar to the work method statements that are often produced for major construction projects.

Step 8: A detailed monitoring plan will be provided along with frequency and responsibilities to ensure all key environmental parameters are monitored to ensure compliance with both national and ADB requirements.

Template for SSEMP

Introduction

Project Overview

Scope of SSEMP

Objectives of SSEMP

Map of Sensitive Receptors

Construction Activities

²⁴ ADB, Safeguards Unit for Central & West Asia Department, *Environmental Management for Construction Handbook*.

Activities

Risk Assessment

Risk Assessment Matrix & Mitigation Measures

Site Plan(s)

Environmental Monitoring Plan

Instrumental Monitoring of Environmental Parameters by Contractor as per EMP

In-house monitoring

Third Party environmental monitoring

Visual monitoring of Environmental Parameters by Contractor as per EMP

Responsibilities

Organizational Responsibilities and Communication

Responsibility of EA

Responsibility of Construction Supervision Consultant (CSC)

Responsibility of Contractor

Responsibility of EPA

ANNEXURE J

Traffic Management Plan

J.1 Need for Plan

The construction of the park and laying/replacement of distribution networks will take over 24 months and in this period, huge vehicular movement carrying large amount of material and machinery is expected. This will definitely interrupt the local traffic and is therefore important to manage the traffic to avoid the nuisance to local residents in terms of noise, dust, congestion and inconvenience.

J.2 The plan

The Objective of Traffic Management Plan (TMP) is to define the requirements that shall be implemented to mitigate any potential negative risks to the environment, workers or the community resulting from construction traffic.

The TMP will advise and inform site Contractors and external suppliers of equipment and materials of access and entry points along with other key information such tipping areas and wash-out areas. It is intended to compliment and work alongside relevant ESMMP. The TMP will be classed as “live” and therefore be subjected to updates as required.

Contractor, at the time of the execution of the project will prepare a comprehensive TMP in coordination with local traffic police department, PMU, emergency services and local administrative department. The PMU and CSC will review and approve contractors TMP. The contractor's TMP shall include following mitigation measures during its preparation:

Undertake a road conditions assessment prior to and following the peak construction period, to assess any damage to road infrastructure that can be attributed to Project construction.

Repair damage as appropriate or enter into a voluntary agreement with the relevant roads authority to reimburse the cost of any repairs required to the public road network as a result of the Project.

Spoil dumpsites located close to Project site to minimize journey distance and limit movements to site access roads.

Concrete mixing plant located at Project site limiting traffic movements associated with concrete delivery to site access roads

Construction of worker accommodation on site to reduce light vehicle movements relating to travel to/ from the site

Provision of bus/minibus services for personnel living in nearby settlements

Movements of construction workers will be planned to avoid the busiest roads and times of day when traffic is at its greatest.

Schedule deliveries and road movements to avoid peak periods

Road maintenance fund to leave a useful asset for communities after the construction phase.

Driver training for HGV drivers and refresher course every six months for Project drivers

Speed restrictions for project traffic travelling through communities (to be agreed with Traffic Management Authority)

Run a safety campaign to improve the people's knowledge of the traffic hazard on their roads, public information and other activities to address the issues.

Run a pedestrian awareness programme

Temporary signage

The traffic management plan is provided below.

J.3 Other Recommendations

It is important to manage public access routes during construction because it can cause delay to local traffic and create a safety hazard both on and offsite. People working and living near the project site would be annoyed by the emissions, noise and visual intrusion of queuing vehicles. Some important factors involved in access routes and site traffic are as follows:

J.3.1 Public Access Routes

The use of public road for site access may be restricted in terms of:

Vehicle size, width and type of load

Time limits

Parking

Pedestrian conflicts

Contractor shall have consultation with the local police or local authority to address these issues and to effectively manage them before the beginning of the construction.

J.3.2 Site Workers Traffic

Site personnel shall not be permitted to park vehicles near the site boundary; this will lead to disruption in material deliveries. Designated parking area with appropriate parking space will be needed for this purpose; any plain area near construction site can be used for this purpose.

J.3.3 Site Rules

Access to and from the site must be only via the specified entrance.

On leaving the site, vehicles must be directed to follow the directions given.

Drivers must adhere to the site speed limits.

All material deliveries to site must keep allocated time limits.

No material or rubbish shall be left in the loading-unloading area.

Develop a map for alternate routes showing material delivery services.

Assign designated personnel on site to receive deliveries and to direct the vehicles.

Monitor vehicle movement to reduce the likelihood of queuing or causing congestion in and around the area.

Project vehicles shall have a unanimous badge or logo on windscreens displaying that they belong to the Salhad park project.

J.4 Contractor's Obligation

The traffic management plan of the Contractor shall be safe enough and widening of access roads and construction of the detours must be completed before start of project construction activities so that heavy vehicular transportation for construction activities do not hinder the normal course of traffic lanes. While widening the access roads, the safe movement of the vehicles, people, animals and wildlife must be ensured. It will be sole responsibility of Contractor. The roads widening shall be designed on the basis of the traffic survey, summarized and estimated site traffic. Contractor must ensure that road closures are carried out by a competent person. The Contractor obligation must include the display of traffic signs according to the need to divert the traffic volume and to guide the road users in advance. The traffic sign, traffic light shall be placed from any diverting route or road marking.

The Contractor shall consider the environmental and social impacts of the traffic during construction. It will be sole responsibility of the Contractor to implement a plan which produces minimum nuisance to the local people and to the environment. Safety of the people shall be given due importance. It will be under Contractor obligation to notify the traffic management plan and its later changes to CSC, PMU, emergency services and Traffic Police, and also publish weekly programmer in local newspapers.

ANNEXURE K

NEQS Guidelines

Parameter	Unit	Standards (maximum allowable limit)
Temperature increase	°C	<3
pH value (acidity / basicity)	pH	6-9
5-day biochemical oxygen demand (BOD) AT 20 °C	mg/l	80
Chemical oxygen demand (COD)	mg/l	150
Total dissolved solids	mg/l	200
Total dissolved solids	mg/l	3,500
Grease and oil	mg/l	10
Phenolic compounds (as phenol)	mg/l	0.1
Chloride (as Cl)	mg/l	1.0
Fluoride (as F)	mg/l	10
Sulfate (SO ₄)	mg/l	600
Ammonia (NH ₃)	mg/l	40
Cadmium	mg/l	0.1
Chromium (trivalent and hexavalent)	mg/l	1.0
Copper	mg/l	1.0
Lead	mg/l	0.5
Mercury	mg/l	0.01
Selenium	mg/l	0.5
Nickel	mg/l	1.0
Silver	mg/l	1.0
Total toxic metals	mg/l	2.0
Zinc	mg/l	5
Arsenic	mg/l	1.0
Barium	mg/l	1.5
Iron	mg/l	8.0
Manganese	mg/l	1.5
Boron	mg/l	6.0
Chlorine	mg/l	1.0

Notes:

1. The standard assumes that dilution of 1:10 on discharge is available. That is, for each cubic meter of treated effluent, the recipient water body should have 10 m³ of water for dilution of this effluent.
2. Toxic metals include cadmium, chromium, copper, lead, mercury, selenium, nickel and silver. The effluent should meet the individual standards for these metals as well as the standard for total toxic metal concentration.

Source: Government of Pakistan (2000) (SRO 549(I)/2000).

Pollutants	Time-Weighted Average	Concentration in Ambient Air		Method of Measurement
		Effective from 1st July 2010	Effective from 1st January 2013	
Sulfur Dioxide (SO ₂)	Annual Average *	80 µg/m ³	80 µg/m ³	Ultraviolet Fluorescence
	24 hours**	120 µg/m ³	120 µg/m ³	
Oxides of Nitrogen as (NO)	Annual Average*	40 µg/m ³	40 µg/m ³	Gas Phase Chemiluminescence
	24 hours**	80 µg/m ³	80 µg/m ³	
Ozone (O ₃)	1 hour	180 µg/m ³	130 µg/m ³	Non dispersive UV absorption
Suspended Particulate Matter (SPM)	Annual Average*	400 µg/m ³	360 µg/m ³	High Volume Sampling, (Average flow rate not less than 1.1 m ³ /minute).
	1 hour	180 µg/m ³	130 µg/m ³	
Respirable Particulate Matter. PM ₁₀	Annual Average*	200 µg/m ³	120 µg/m ³	β Ray absorption
	24 hours**	250 µg/m ³	150 µg/m ³	
Respirable Particulate Matter. PM _{2.5}	Annual Average*	25 µg/m ³	15 µg/m ³	β Ray absorption
	24 hours**	40 µg/m ³	35 µg/m ³	
	1 hour	25 µg/m ³	15 µg/m ³	
Lead (Pb)	Annual Average*	1.5 µg/m ³	1.0 µg/m ³	ASS Method after sampling using EPM 2000 or equivalent Filter paper
	24 hours**	2.0 µg/m ³	1.5 µg/m ³	
Carbon Monoxide (CO)	8 hours**	5 µg/m ³	5 µg/m ³	Non dispersive Infra-Red (NDIR)
	1 hour	10 µg/m ³	10 µg/m ³	

* Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

24 hourly / 8 hourly values should be met 98% of the time in a year. 20% of the time, it may exceed but not on two consecutive days.

Source: Government of Pakistan (2010) (SRO 1062 (I)/ 2010).

National Environmental Quality Standards for Noise¹

S/No.	Category of Area/Zone	Limit in dB(A) Lea	
		Day Time	Night Time
1	Residential area (A)	55	45
2	Commercial area (B)	65	55
3	Industrial area (C)	75	65
4	Silence zone (D)	50	45

1: Effective from 1st July, 2012.

Note: 1. Day time hours: 6 am to 10 pm

2. Night time hours: 10 pm to 6 am

3. Silence zone: Zones that are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts.

4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

National Environmental Quality Standards for Motor Vehicle Exhaust and Noise

(A) For In-use Vehicles

Sr. No.	Parameter	Standard (Maximum permissible Limit)	Measuring Method	Applicability
1	Smoke	40% or 2 on the Ringlemann Scale during engine acceleration mode	To be compared with Ringlemann Chart at a distance 6 or more.	Immediate effect
2	Carbon Monoxide	6%	Under idling conditions: Non-dispersive infrared detection through gas analyzer.	
3	Noise	85 db (A).	Sound meter at 7.5 meters from the source.	

(B) For New Vehicles**(i) Emission Standards for Diesel Vehicles****(a) For Passenger Cars and Light Commercial Vehicles (g/Km)**

Type of Vehicle	Category/Class	Tiers	CO	HC+ NOX	PM	Measuring Method	Applicability		
Passenger Cars	M 1: with reference mass (RW) upto 2500 kg. Cars with RW over 2500 kg to meets NI category standards.	Pak-II IDI	1.00	0.70	0.08	NEDC (ECE 15+ EUDCL)	All imported and local manufactured diesel vehicles with effect from 01-07-2012		
		Pak-II DI	1.00	0.90	0.10				
Light Commercial Vehicles	NI-I (RW<1250 kg)	Pak-II IDI	1.00	0.70	0.08				
		Pak-II DI	1.00	0.90	0.10				
	NI-I (1250 kg< RW< 1700 kg)	Pak-II IDI	1.25	1.00	0.12				
		Pak-II DI	1.25	1.30	0.14				
	NI-III (RW>1700 kg)	Pak-II IDI	1.50	1.20	0.17				
		Pak-II DI	1.50	1.60	0.20				
Parameter	Standard (maximum permissible limit)			Measuring Method					
Noise	85 db (A)			Sound meter at 7.5 meters from the source.					

(ii) Emission Standards for Petrol Vehicles (g/km)

Type of Vehicle	Category/Class	Tiers	CO	HC+ NOX	Measuring Method	Applicability	
Passenger	M 1: with reference mass (RW) upto 2500 kg. Cars with RW over 2500 kg to meets NI category standards.	Pak-II	2.20	0.50	NEDC (ECE 15+ EUDCL)	All imported and new models* locally manufactured petrol vehicles with effect from 1st July, 2009**	
Light Commercial Vehicles	NI-I (RW<1250 kg)	Pak-II	2.20	0.50			
	NI-I (1250 kg> RW< 1700 kg)	Pak-II	4.00	0.65			
	NI-III (RW>1700 kg)	Pak-II	5.00	0.80			
Motor Rickshaws and motor Cycles	2.4 strokes < 150 cc	Pak-II	5.50	1.50	ECER 40		
	2.4 strokes < 150 cc	Pak-II	5.50	1.30			
Parameter	Standard (maximum permissible limit)				Measuring Method		
Noise	85 db (A)				Sound meter at 7.5 meters from the source.		

Explanations:

DI: Direct Injection

IDI: Indirect Injection

EUDCL: Extra Urban Driving Cycle

NEDC: New Urban Driving Cycle

M: Vehicles designed and constructed for the carriage of passengers and comprising no more than eight seats in addition to the driver's seat.

N: Motor vehicles with at least four wheels designed and constructed for the carriages of goods.

* New model means both model and engine type change

** The existing models of petrol driven vehicles locally manufactured will immediately switch over to Pak-II emission standards but not later than 30th June, 2012.

Source: Government of Pakistan (2009) (SRO 72 (KE)/ 2009).

National Standards for Drinking Water Quality

Properties/Parameters		Standard Values for Pakistan
Bacterial		
All water intended for drinking (E.Coli or Thermo tolerant Coliform bacteria)		Must not be detectable in any 100 ml samples
Treated water entering the distribution system (E.Coli or thermo tolerant coliform and total coliform bacteria)		Must not be detectable in any 100 ml samples
Treated water in the distribution system (E.Coli or thermo tolerant coliform and total coliform bacteria)		Must not be detectable in any 100 ml samples In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.
Physical		
Color	< 15 TCU	
Taste	Non objectionable/ Acceptable	
Odor	Non objectionable/Acceptable	
Turbidity	< 5 NTU	
Total hardness as CaCO ₃	< 500 mg/l	
TDS	< 1000	
pH	6.5-8.5	
Chemical		
Essential Inorganic		mg/Litre
Aluminum (Al)	< 0.005(P)	
Antimony	< 0.05(P)	
Arsenic (As)	< 0.05(P)	
Barium (Ba)	0.7	
Boron (B)	0.3	
Cadmium (Cd)	0.01	
Chloride (Cl)	<250	
Chromium (Cr)	< 0.05	
Copper (Cu)	2	
Toxic Inorganic		Mg/Litre
Cyanide (Cn)	< 0.05	
Fluoride (F)*	< 1.5	
Lead (Pb)	< 0.05	
Manganese (Mn)	< 0.5	
Mercury (Hg)	< 0.001	
Nickel (Ni)	< 0.02	
Nitrate (NO ₃)*	< 50	
Nitrate (NO ₂)*	< 3 (P)	
Selenium (Se)	0.01 (P)	
Residual chlorine	0.2-0.5 at consumer end; 0.5-1.5 at source	
Zinc (Zn)	5.0	
Organic		
Pesticides mg/l	PSQCA No. 4639-2004, Page No. 4 Table No. 3 Serial No. 20-58 may be consulted.**	
Phenolic compound (as phenols) mg/l	WHO standards: < 0.002	
Polynuclear Aromatic hydrocarbon (as PAH) g/L	WHO standards: < 0.01v (by GC/MS method)	
Radioactive		
Alpha Emitters bq/L or pCi	0.1	
Beta Emitters	1	

* Indicates priority health related inorganic constituents which need regular monitoring.

** PSQCA: Pakistan Standards Quality Control Authority.

Source: Government of Pakistan (2010) (SRO 1063(I)/2010).

ANNEXURE L

WHO/GoP advice on Use of Masks for the COVID-19 Virus

Advice on the use of masks in the context of COVID-19: interim guidance

masks away from those in health care who need them most, especially when masks are in short supply.

Persons with symptoms should:

- wear a medical mask, self-isolate, and seek medical advice as soon as they start to feel unwell. Symptoms can include fever, fatigue, cough, sore throat, and difficulty breathing. It is important to note that early symptoms for some people infected with COVID-19 may be very mild;
- follow instructions on how to put on, take off, and dispose of medical masks;
- follow all additional preventive measures, in particular, hand hygiene and maintaining physical distance from other persons.

All persons should:

- avoid groups of people and enclosed, crowded spaces;
- maintain physical distance of at least 1 m from other persons, in particular from those with respiratory symptoms (e.g., coughing, sneezing);
- perform hand hygiene frequently, using an alcohol-based hand rub if hands are not visibly dirty or soap and water when hands are visibly dirty;
- cover their nose and mouth with a bent elbow or paper tissue when coughing or sneezing, dispose of the tissue immediately after use, and perform hand hygiene;
- refrain from touching their mouth, nose, and eyes.

In some countries masks are worn in accordance with local customs or in accordance with advice by national authorities in the context of COVID-19. In these situations, best practices should be followed about how to wear, remove, and dispose of them, and for hand hygiene after removal.

Advice to decision makers on the use of masks for healthy people in community settings

As described above, the wide use of masks by healthy people in the community setting is not supported by current evidence and carries uncertainties and critical risks. WHO offers the following advice to decision makers so they apply a risk-based approach.

Decisions makers should consider the following:

1. **Purpose of mask use:** the rationale and reason for mask use should be clear—whether it is to be used for source control (used by infected persons) or prevention of COVID-19 (used by healthy persons)
2. **Risk of exposure** to the COVID-19 virus in the local context:
 - The population: current epidemiology about how widely the virus is circulating (e.g., clusters of cases versus community transmission), as well as local surveillance and testing capacity (e.g., contact tracing and follow up, ability to carry out testing).
 - The individual: working in close contact with public (e.g., community health worker, cashier)
3. **Vulnerability** of the person/population to develop severe disease or be at higher risk of death, e.g. people with comorbidities, such as cardiovascular disease or diabetes mellitus, and older people

refers to transmission of the virus from a person, who does not develop

4. **Setting** in which the population lives in terms of population density, the ability to carry out physical distancing (e.g. on a crowded bus), and risk of rapid spread (e.g. closed settings, slums, camps/camp-like settings).
5. **Feasibility:** availability and costs of the mask, and tolerability by individuals
6. **Type of mask:** medical mask versus nonmedical mask (see below)

In addition to these factors, potential advantages of the use of mask by healthy people in the community setting include reducing potential exposure risk from infected person during the “pre-symptomatic” period and stigmatization of individuals wearing mask for source control.

However, the following potential risks should be carefully taken into account in any decision-making process:

- self-contamination that can occur by touching and reusing contaminated mask
- depending on type of mask used, potential breathing difficulties
- false sense of security, leading to potentially less adherence to other preventive measures such as physical distancing and hand hygiene
- diversion of mask supplies and consequent shortage of mask for health care workers
- diversion of resources from effective public health measures, such as hand hygiene

Whatever approach is taken, it is important to develop a strong communication strategy to explain to the population the circumstances, criteria, and reasons for decisions. The population should receive clear instructions on what masks to wear, when and how (see mask management section), and on the importance of continuing to strictly follow all other IPC measures (e.g., hand hygiene, physical distancing, and others).

Type of Mask

WHO stresses that it is critical that medical masks and respirators be prioritized for health care workers.

The use of masks made of other materials (e.g., cotton fabric), also known as nonmedical masks, in the community setting has not been well evaluated. There is no current evidence to make a recommendation for or against their use in this setting.

WHO is collaborating with research and development partners to better understand the effectiveness and efficiency of nonmedical masks. WHO is also strongly encouraging countries that issue recommendations for the use of masks in healthy people in the community to conduct research on this critical topic. WHO will update its guidance when new evidence becomes available.

Advice on the use of masks in the context of COVID-19: interim guidance

In the interim, decision makers may be moving ahead with advising the use of nonmedical masks. Where this is the case, the following features related to nonmedical masks should be taken into consideration:

- Numbers of layers of fabric/tissue
- Breathability of material used
- Water repellence/hydrophobic qualities
- Shape of mask
- Fit of mask

Home care

For COVID-19 patients with mild illness, hospitalization may not be required. All patients cared for outside hospital (i.e. at home or non-traditional settings) should be instructed to follow local/regional public health protocols for home isolation and return to designated COVID-19 hospital if they develop any worsening of illness.⁷

Home care may also be considered when inpatient care is unavailable or unsafe (e.g. capacity is limited, and resources are unable to meet the demand for health care services). Specific IPC guidance for home care should be followed.³

Persons with suspected COVID-19 or mild symptoms should:

- Self-isolate if isolation in a medical facility is not indicated or not possible
- Perform hand hygiene frequently, using an alcohol-based hand rub if hands are not visibly dirty or soap and water when hands are visibly dirty;
- Keep a distance of at least 1 m from other people;
- Wear a medical mask as much as possible; the mask should be changed at least once daily. Persons who cannot tolerate a medical mask should rigorously apply respiratory hygiene (i.e. cover mouth and nose with a disposable paper tissue when coughing or sneezing and dispose of it immediately after use or use a bent elbow procedure and then perform hand hygiene.)
- Avoid contaminating surfaces with saliva, phlegm, or respiratory secretions.
- Improve airflow and ventilation in their living space by opening windows and doors as much as possible.

Caregivers or those sharing living space with persons suspected of COVID-19 or with mild symptoms should:

- Perform hand hygiene frequently, using an alcohol-based hand rub if hands are not visibly dirty or soap and water when hands are visibly dirty;
- Keep a distance of at least 1 meter from the affected person when possible;
- Wear a medical mask when in the same room as the affected person;
- Dispose of any material contaminated with respiratory secretions (disposable tissues) immediately after use and then perform hand hygiene.
- Improve airflow and ventilation in the living space by opening windows as much as possible.

Health care settings

WHO provides guidance for the use of PPE, including masks, by health care workers in the guidance document: Rationale use of PPE in the context of COVID-19.²⁴ Here we provide advice for people visiting a health care setting:

Symptomatic people visiting a health care setting should:

- Wear a medical mask while waiting in triage or other areas and during transportation within the facility;
- Not wear a medical mask when isolated in a single room, but cover their mouth and nose when coughing or sneezing with disposable paper tissues. Tissues must be disposed of appropriately, and hand hygiene should be performed immediately afterwards.

Health care workers should:

- Wear a medical mask when entering a room where patients with suspected or confirmed COVID-19 are admitted.
- Use a particulate respirator at least as protective as a US National Institute for Occupational Safety and Health-certified N95, European Union standard FFP2, or equivalent, when performing or working in settings where aerosol-generating procedures, such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy are performed.
- Full infection prevention and control guidance for health care workers is provided [here](#).

One study that evaluated the use of cloth masks in a health care facility found that health care workers using cotton cloth masks were at increased risk of infection compared with those who wore medical masks.²⁵ Therefore, cotton cloth masks are not considered appropriate for health care workers. As for other PPE items, if production of cloth masks for use in health care settings is proposed locally in situations of shortage or stock out, a local authority should assess the proposed PPE according to specific minimum standards and technical specifications.

Mask management

For any type of mask, appropriate use and disposal are essential to ensure that they are effective and to avoid any increase in transmission.

The following information on the correct use of masks is derived from practices in health care settings:

- Place the mask carefully, ensuring it covers the mouth and nose, and tie it securely to minimize any gaps between the face and the mask.
- Avoid touching the mask while wearing it.
- Remove the mask using the appropriate technique: do not touch the front of the mask but untie it from behind.
- After removal or whenever a used mask is inadvertently touched, clean hands using an alcohol-based hand rub or soap and water if hands are visibly dirty.
- Replace masks as soon as they become damp with a new clean, dry mask.
- Do not re-use single-use masks.
- Discard single-use masks after each use and dispose of them immediately upon removal.

Advice on the use of masks in the context of COVID-19: interim guidance

WHO continues to monitor the situation closely for any changes that may affect this interim guidance. Should any factors change, WHO will issue a further update. Otherwise, this interim guidance document will expire 2 years after the date of publication.

References

1. Water, sanitation, hygiene and waste management for COVID-19 <https://www.who.int/publications/detail/water-sanitation-hygiene-and-waste-management-for-covid-19>
2. Coronavirus disease 2019 (COVID-19) Situation Report – 73. https://www.who.int/docs/default-source/coronavirus/situation-reports/20200402-sitrept-73-covid-19.pdf?sfvrsn=5ae25bc7_6
3. Yu P, Zhu J, Zhang Z, Han Y. A familial cluster of infection associated with the 2019 novel coronavirus indicating possible person-to-person transmission during the incubation period. *J Infect* 2020 doi:10.1093/jiaa077
4. Huang R, Xia J, Chen Y, Shan C, Wu C. A family cluster of SARS-CoV-2 infection involving 11 patients in Nanjing, China *Lancet Infect Dis* 2020 doi: 10.1016/S1473-3099(20)30147-X
5. Pan X, Chen D, Xia Y et al. Asymptomatic cases in a family cluster with SARS-CoV-2 infection. *Lancet Infect Dis* 2020 doi: 10.1016/S1473-3099(20)30114-6.
6. Tong Z-D, Tang A, Li K-F, Li P, Wang H-L, Yi J-P, et al. Potential presymptomatic transmission of SARS-CoV-2, Zhejiang Province, China, 2020. *Emerg Infect Dis*. 2020 doi: 10.3201/eid2605.200198
7. Wei WE, Li Z, Chiew CJ, Yong SE, et al. Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020. *MMWR*, 1 April 2020/69.
8. Kimball A, Hatfield KM, Arons M, James A, et al. Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility — King County, Washington, March 2020. *MMWR*, 3 April 2020, 69(13);377–381.
9. WorldHealthOrganization.ReportoftheWHO-ChinaJointMissiononCoronavirusDisease2019(CO VID-19) 16-24 February 2020 [Internet]. Geneva: World Health Organization; 2020 Available from: <https://www.who.int/docs/default-source/coronavirus/who-china-joint-mission-on-covid-19-final-report.pdf>
10. Wei WE, Li Z, Chiew CJ, Yong SE, et al. Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020. *MMWR*, 1 April 2020/69.
11. World Health Organization. Infection prevention and control during health care when COVID-19 is suspected: interim guidance, (accessed 29 January 2020).
12. World Health Organization. Home care for patients with COVID-19 presenting with mild symptoms and management of contacts: interim guidance (accessed 29 January 2020)
13. Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care. Geneva; World Health Organization; 2014 (https://apps.who.int/iris/bitstream/handle/10665/112656/9789241507134_eng.pdf, accessed 17 January 2020).
14. Aiello AE, Coulborn RM, Perez V, et al. A randomized intervention trial of mask use and hand hygiene to reduce seasonal influenza-like illness and influenza infections among young adults in a university setting. *International Journal of Infectious Diseases* 2010;14:E320-E20. doi: 10.1016/j.ijid.2010.02.220
15. Cowling BJ, Fung ROP, Cheng CKY, et al. Preliminary Findings of a Randomized Trial of Non-Pharmaceutical Interventions to Prevent Influenza Transmission in Households. *Plos One* 2008;3(5) doi: 10.1371/journal.pone.0002101
16. Suess T, Remschmidt C, Schink SB, et al. The role of facemasks and hand hygiene in the prevention of influenza transmission in households: results from a cluster randomised trial; Berlin, Germany, 2009–2011. *BMC Infect Dis* 2012;12:26. doi: 10.1186/1471-2334-12-26.[published Online First: 2012/01/28]
17. Aiello AE, Perez V, Coulborn RM, et al. Facemasks, hand hygiene, and influenza among young adults: a randomized intervention trial. *PLoS One* 2012;7(1):e29744. doi:10.1371/journal.pone.0029744. Epub 2012 Jan 25. [published Online First: 2012/02/02]
18. Barasheed O, Almasri N, Badahdah AM, et al. Pilot Randomised Controlled Trial to Test Effectiveness of Facemasks in Preventing Influenza-like Illness Transmission among Australian Hajj Pilgrims in 2011. *Infect Disord Drug Targets* 2014;14(2):110-6. doi: 10.2174/1871526514666141021112855 [published Online First: 2014/10/23]
19. Canini L, Andreoletti L, Ferrari P, et al. Surgical mask to prevent influenza transmission in households: a cluster randomized trial. *PLoS One* 2010;5(11):e13998. doi:10.1371/journal.pone.0013998. [published Online First: 2010/11/26]
20. MacIntyre CR, Zhang Y, Chughtai AA, et al. Cluster randomised controlled trial to examine medical mask use as source control for people with respiratory illness. *BMJ Open* 2016;6(12):e012330. doi: 10.1136/bmjjopen-2016-012330. [published Online First: 2017/01/01]
21. Lau JT, Tsui H, Lau M, Yang X. SARS transmission, risk factors, and prevention in Hong Kong. *Emerg Infect Dis*. 2004 Apr;10(4):587-92.
22. Wu J, Xu F, Zhou W et al. Risk factors for SARS among persons without known contact with SARS patients, Beijing, China. *Emerg Infect Dis*. 2004 Feb;10(2):210-6.



Date: 11 April 2020
Document Code: 11-01
Version: 01

Guidelines

Health & Safety of Building & Construction Workers during COVID-19 Outbreak

Objective

To provide guidelines for the workers involved in building and construction work during the current epidemic of COVID-19.

Rationale

Construction processes are dynamic with significantly varying number of workers on a construction project site from day to day. The workers coming from diverse environments and working closely together increases the risk of exposure to COVID 19.

Building construction involves earth work, procurement of materials and supplies and their storage, construction work done by masons, blacksmiths, electricians, carpenters, plumbers, painters, supervisors, managers and security personnel. These guidelines provide the safety measure to be implemented at the construction site having a dusty environment, continuous flow of different materials and make-shift type of arrangements for storage, food and sanitation calls for implementation of safety precautions at the very basic level of personal hygiene only.

Advice for Site Managers:

Without prejudice to the following, all possible and prescribed actions shall be taken at the project site, as should facilitate the health of all life present at the site.

- Every construction project shall make proper arrangements for uninterrupted building services including but not restricted to, electricity, fuel, water supply, water disposal and sanitation, communication links, washrooms with hand hygiene and shower facility and with proper and adequate supply of soaps and disinfectants.
- Workers should not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site
- Ensure the availability of the thermal gun at the entry and exit of the construction site and no worker should be allowed without getting his/her temperature checked.
- Site manager must maintain a register of all contact details with NID number and addresses of all present at the site in case a follow up or tracing and tracking of contacts is required at a later stage.
- Develop the employee roaster to decrease the number of people on the site every day. Split the shifts of the workers in morning and evening with limit of each shift to 8 working hours.



- Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours end.
- In addition to all other internationally recognized safety precaution for construction workers and other staff, every individual must be provided with a face mask. It must be ensured that everyone during his or her presence at the site continues to wear the mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands.
- Non-essential work trainings must be postponed avoiding gathering of people.
- Ensure the physical distance by creating more than one route of entry and exit to the site.
- Instruct the workers to inform the construction manager (or authorities) if
 - They develop any symptoms of cough, flu or fever.
 - They have been exposed to someone suspected or confirmed with COVID 19.
 - They have met someone who has a travel history of COVID 19 endemic country
 - They have travelled in last couple of days or plan to travel soon
- All incidences of appearance of the symptoms of COVID-19 shall be immediately documented and maintained at the site and information regarding which shall be immediately communicated through e-mail or else, to the designated health facility, and the sick worker shall be transported to the health facility for further advice and action. The site manager must establish a link with a nearby healthcare facility with arrangements for quick transportation of workers in case of an emergency.
- Persuade the workers to inform the authorities for their safety and of other if they observe any signs and symptoms in a colleague
- Do not allow any worker at the construction site who has the symptoms
- Display the awareness banners about hand hygiene and physical distancing, where you can, around the work site.
- Everyone on the construction site must observe sneezing and coughing etiquettes.
- Workers shall be requested and required to wash their hands as frequently as practicable and shall also be advised not to touch their face with their hands during work.
- Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix.
- Only sanitize-able dinning surfaces shall be used, which must be cleaned before each service. Food must be heated to a temperature to no less than 70° C before consumption and shall preferably be served in disposable utensils. If reusable utensils are used, these must be washed with soap and water immediately after use and stored at a safe place.
- The lunch breaks and stretch breaks of the workers must be staggered to avoid the clustering of workers. Workers must not sit at less than 2 meters distance while having meals and while any other activity requiring interpersonal communications.
- In the wake of current restrictions on transportations site mangers will ensure safe transport arrangements for worker which should not be crowded and should have social distancing in place during the entire process from pickups till drops at destination



- In case of workers sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms
- A supply of safe drinking water must be made available at the project site and maintained.

Advice for Construction Workers:

- All possible and prescribed measures shall be taken to ensure your and others health
- Enter your contact details in the register maintained at the site, in case a follow up or tracing and tracking of contacts is required at a later stage.
- Follow hygiene practices at washrooms and shower facility with proper and adequate use of soaps and disinfectants.
- Every worker must change into standard working attire at the time of commencement of duty and change back to their regular dress after taking shower when their duty hours end.
- In addition to all other internationally recognized safety precaution for construction workers and other staff, every individual must use face mask. Face mask shall be replaced as and when soiled or otherwise removed. Outer surface of face mask must not be touched with hands.
- Workers should wash their hands as frequently as practicable and shall not touch their face with their hands during work.
- Everyone on the construction site must observe sneezing and coughing etiquettes.
- Workers must maintain no less than two arm lengths between them before, during after work at all the times. They shall not make physical contact and shall be required to maintain separate personal gears and assets which must be clearly labelled and stored without intermix.
- Sick worker should immediately inform the site manager and must get medical advice from nearby health centre.
- Only sanitizable dining surfaces shall be used. Food must be heated to a temperature to no less than 70°C before consumption and shall preferably be in disposable utensils. If reusable utensils are used, these must be washed with soap and water immediately after use and stored at a safe place.
- Do not sit at less than 2 meters distance while having meals and while any other activity requiring interpersonal communications.
- Do not use biometric attendance machines or crowd during attendance, entry or exit to the premises of the construction site.
- Use safe transport arrangements which should not be crowded and should have social distancing in place during the entire process from pickups till drops at destination.
- In case sleeping in at the site of construction, a safe distance of 2 meters must be ensured in the sleeping rooms.

Deliveries or Other Contractors Visiting the Site

- Non-essential visits to the construction sites should be cancelled or postponed.



Government of Pakistan
Ministry of National Health Services,
Regulations & Coordination

- Delivery workers or other contractors who need to visit the construction site must go through temperature check before entering and should be given clear instructions for precautions to be taken while on site.
- Designate the workers, with protective gears or at least gloved and mask, to attend to the deliveries and contractors.
- Make alcohol-based hand sanitizer (at least 70%) available for the workers handling deliveries.
- Instruct the visiting truck drivers to remain in their vehicles and whenever possible make use of contactless methods, such as mobile phones, to communicate with your workers.

Note: The above recommendations are being regularly reviewed by the Ministry of National Health Services, Regulations & Coordination and will be updated based on the international & national recommendations and best practices.

The Ministry acknowledges the contribution of Irfan Mirza, Sveva Shehriyana Akhtar and HSA/ HPSIU// NIH team to compile these guidelines.

For more information, please contact:

HSA/ HPSIU// NIH, PM National Health Complex, Islamabad

<http://covid.gov.pk/>

<http://nhsrc.gov.pk/> <https://www.facebook.com/NHSRCOfficial>

<http://www.hsa.edu.pk/> <https://twitter.com/nhsrcofficial>

<http://www.nih.org.pk/> https://www.youtube.com/channel/UCdYuzeSP4Ug1f_ZZK1

ANNEXURE M

Solid Waste Management Framework

Framework for Solid Waste Management

1. INTRODUCTION

Framework Solid Waste Management Plan for the development of Salhad Park. Construction contractors may use this framework as guiding document for preparation of site specific solid waste management plan. The purpose of this Framework Solid Waste Management Plan is to ensure that wastes arising from the proposed construction works at Salhad Park are managed, reused, recovered or disposed of by a method that ensures the provisions of the KP EPA Act, 2014 and Pakistan Environmental Protection, 1997 and ADB SPS, 2009. It also ensures that the optimum levels of waste reduction, re-use and recycling are achieved.

Waste management priorities for project are based on following waste management hierarchy.

- Prevent material wastage
- Minimize the quantity of waste
- Reuse of site materials
- Recycling of waste
- Energy recovery
- Disposal

2. WASTE MANAGEMENT

2.1 National Level

Waste management of the project will be carried as per national rules including:

- Solid Waste Management Policy, 2000
- Requirements of KP EPA, 2014
- Draft Guidelines on Solid Waste Management, 2005.
- Section 11 of PEPA, 1997 prohibits discharge of waste in amount that violates the NEQS.
- Draft Hazardous Substances rule of 1999
- Section 132 of Cantonment Act, 1942
- Provision Contains in the Local Government Ordinance, 2001

2.2 Regional Level

- Asian Development Bank (ADB) SPS, 2009
- IFC guidelines for Solid Waste Management
- Best practices of waste management on construction sites

3. DESCRIPTION OF THE PROJECT

The proposed park will be developed at Salhad, Abbottabad through remediation of a site presently being used for waste dumping.

3.1 Details of the wastes to be produced

During construction/civil works potential sources of waste will include spoils generated during excavation, concrete and construction waste, domestic wastes (solid & wastewater), fuel or oil leakages or spills, onsite effluents from vehicle wash & cleaning, and cement spills. It is the responsibility of all personnel on site including Contractors, Sub-Contractors and their Employees to ensure compliance with this Waste Management Plan.

3.2 Main Waste Categories

Contractors are required to develop inventory of main waste categories that will be generated during construction phase of the project. Anticipated main waste categories include construction debris, concrete waste, scrap wood, bricks, concrete, asphalt, plumping fixtures, piping, insulation (asbestos and non-asbestos), metal scraps, oil, electrical wiring and components, chemicals, paints, solvents.

3.3 Anticipated Hazardous Waste Arising

Fuels stored on site that will be used during the construction phase are classed as hazardous. There will be fuel stored on site for machinery and construction vehicles. All fuel tanks and draw off points will be bunded. If the fuel is correctly contained and bunded, it is not expected that there will be any fuel wastage at the site. Other sources of hazardous waste include used paints, used oil/lubricants, electrical waste and chemicals. Project contractors are required to develop SOPs for handling, storage and disposal of hazardous waste arising from the project.

4. ESTIMATED WASTE GENERATION

4.1 Construction Waste Generation

Project contractors are required to develop and maintain waste inventory clearly showing the type, amount and location of waste generated from different activities at the site. Waste record keeping is key to successful implementation of waste management plan.

4.2 Proposed Waste Management Options

Waste will be segregated on site. Contractor will ensure that sufficient number of waste drums are placed at site with appropriate color coding. All recyclable waste will be handed over to recycling contractor. The appointed waste contractor will collect and transfer the recyclable wastes as receptacles are filled. The non-recyclable waste will be transferred by an authorized waste collector to an appropriate facility. Project contractors will identify both recycling and non-recycling contractor working in the project area. Contractors through bidding documents will be bound to hire such waste contractors for efficient waste management at project sites. A successful Waste Management Plan is largely dependent on how readily it can be integrated in to normal site operations by the person responsible. It is recognized that the plan shall not be obstructive to site operations and the construction program by placing the responsibility of construction waste management with the Manager, all reuse, recycling, wastage and necessary disposal can be monitored as close to the source as possible. An Environmental Representative from each Works Sub-Contractor will also be nominated responsible for all waste management in their own operations. In this way, it is possible to identify where the greatest material wastage occurs, with a view to implementing better management.

The site Construction Manager will be designated as the Responsible Person and have overall responsibility for the implementation of the on-site Waste Management Plan. The Responsible Person will be assigned the authority to instruct all site personnel to comply with the specific provisions of the plan. At the operational level, a nominated Environmental Representative from each sub-contractor company on the site shall be assigned the direct responsibility to ensure that the discrete operations stated in this framework for solid waste management are performed on an on-going basis.

4.3 Tracking and documentation procedures for off-site waste

The site construction Manager will maintain a copy of all waste collection permits. If waste (soil & stone) is being accepted on-site, a waste docket must be issued to the collector. If the waste is being transported to another site, a copy of the waste permit for that site must be provided to the manager. Record of waste collection docket, a receipt from the final destination of the material will be kept as part of the on-site waste management records. All information will be entered in a waste management system to be maintained on-site.

4.4 Disposal Waste

Contractors are required to develop SOP for disposal of recyclable, non-recyclable and hazardous waste generated at site. Surplus excavated soil will be disposed off at designated sites. Food waste will be disposed at food waste pit which will be fenced. Recycling waste will be handed over to recycling waste contractor. Hazardous waste will be disposed through incineration facility available in close proximity of the project area. Workers on the site will be encouraged to recycle as much municipal waste as possible i.e. cardboard, plastic, metals and glass. Prior to removal, the municipal waste will be examined to determine if recyclable materials have been placed in other containers. If this is the case, effort will be made to determine the cause of the waste not being segregated correctly.

5. ESTIMATED COST OF WASTE MANAGEMENT

Contractors are required to estimate and budget cost for waste management through BOQ items. Such waste management cost shall include cost of waste drums, cost of waste handling crew, cost of waste transportation, cost of EPA approved waste contractor services and associated incineration costs if any. By reusing materials on site, there will be reduction in transport and disposal costs for a waste contractor taking the material away.

6. TRAINING PROVISIONS FOR WASTE MANAGER AND SITE CREW

A waste manager will be appointed or designated by construction contractors to ensure commitment, operational efficiency and accountability during the project execution.

6.1 Site Manager Training and Responsibility

The waste manager will be given responsibility and authority to select a waste team if required i.e. members of the site crew that will aid him in the organization, operation and recording the waste management system implemented on-site. The waste manager will have overall responsibility to oversee record and provide feedback to the CSC on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors where necessary and to co-ordinate with suppliers, service providers and sub-contractors to prioritize waste prevention and salvage. The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on-site. He will also be trained in the best method for segregation and storage of recyclable materials, have information on the materials that can be reused on-site and know how to implement this Framework for Solid Waste Management.

6.2 Site Crew Waste Management Training

Training of the site crew is the responsibility of the waste manager and as such, a waste training program shall be organized. A basic awareness course will be held for all crew to outline the construction waste management plan and to detail the segregation of waste at source. This may be incorporated with other training needs (e.g. general site induction, safety training etc.). This basic course will describe the materials to be segregated, the storage methods and the location of the waste storage areas. A subsection on hazardous wastes will be incorporated and the particular dangers of each hazardous waste will be explained.

7. RECORD KEEPING

Records will be kept for each waste material which leaves the site, either for reuse on another site, recovery, recycling or disposal. A system will be put in place to record the construction waste arising on-site. The waste manager or delegate will record the following:

- Waste taken off-site for reuse
- Waste taken off-site for recovery
- Waste taken off-site for recycling
- Waste taken off-site for disposal
- Waste (soil & stone) accepted on-site for recovery

For each movement of waste off-site, a signed waste collection docket will be obtained by the waste manager (or delegate) from the contractor. This will be carried out for each material type. This system will also be linked with the delivery records. A signed waste acceptance docket will be issued for each movement of waste on-site.

8. OUTLINE WASTE AUDIT PROCEDURE

Contractors are required to develop SOP for waste auditing at the construction sites. Such SOP shall reflect frequency and types of waste audits, audit criteria and way forward to close non-compliances.

8.1 Responsibility for Waste Audit

The appointed waste manager will be responsible for conducting a waste audit at the site during project execution.

8.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site, as well as waste accepted, shall be undertaken. If waste movements are not accounted for, the reasons for this shall be established in order to see if and why the record keeping system has not been maintained. Each material type will be examined in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved. Waste management costs will also be reviewed. Upon completion of the construction phase a final report will be prepared summarizing the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

9. CONSULTATION WITH RELEVANT BODIES

9.1 Local Authority

Project contractors are required to maintain close coordination with PMU, WSSC Abbottabad and KP EPA to ensure that all available waste reduction, re-use and recycling opportunities are identified and utilized.

9.2 EPA Approved Waste Contractors

Companies that specialize waste management will be contacted to determine their suitability for engagement. If used, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and/or license are held. In addition, information regarding individual materials will be obtained including the feasibility of recycling each material, the costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off-site.

ANNEXURE N

Species of trees to be planted

Names, appearance, character and quantities of plants proposed for the Salhad Bagh project

S.No.	Plant Name	Appearance	Character	Quantity
1	Pink Magnolia		Fruit, Ornamental, Deciduous	166
2	Bottle Brush		Fruit, Ornamental, Deciduous	160
3	Black Poplar		Deciduous Tree	201
4	Pine Tree		Shady, Ornamental, Evergreen	455

5	White Plumeira (Champa)		Ornamental, Flowers in Summer, Evergreen	82
6	Alstonia		Ornamental, Shady, Evergreen	40
7	Ficus Benjamina Hedge		Hedge, Evergreen	316
8	Rose Bushes		Flower, Evergreen	496
9	Hydrangea		Flower, Deciduous	200