

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan is already in operation since 1963. Now, management is intended to install waste water treatment plant within existing sugar mills campus.

The waste water treatment plant will be installed for treatment of m^3 / hour of waste water, capacity can be extendible to m^3 / hour at later stage. It will be designed for treatment of waste water generated from existing sugar mills. The primary objective of the management is to reduce the pollution load by treating the wastewater by using DAF Technique. In addition, the wastewater generated from the manufacturing of sugar will be treated before disposal.

The proposed site for waste water treatment plant is located at Jetha Bhuta Khan pur, Rahim yar khan. The site was selected due to certain factors such as land availability which is proximity to market at the surrounding location of industries and easily availability of transport at cheaper cost. The management will purchase high quality machinery / equipment for waste water treatment plant project.

ES.2 TITLE OF REPORT

Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan
WASTE WATER TREATMENT PLANT PROJECT

Management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan intends to add a waste water treatment plant. This is Environmental Impact Assessment (EIA) Report along with an Environmental, Social and Risk Management and Monitoring Plan (ESRMP).

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ES.3 PROJECT'S LOCATION

The waste water treatment plant project is proposed to be installed at Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and at the surrounding atmosphere of industries of national importance.

Sugar Mill was established in an economically and industrially backward area of Pakistan to endow with employment opportunities to local population.

Proposed Layout and Google imagery of the project is annexed at the end of the report.

ES.4 NAME OF THE PROPONENT

Sikander Zulqernain

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Askri-11-B, Lahore

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Brief Activities

The management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan will be adding a waste water treatment plant in District RYK for waste water treatment of sugar mills. The pollution load will be reduced significantly by installing proposed project. The site selected site is under the ownership of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.

It contained mainly the suspended and dissolved inorganic or organic solids which are insignificant. Wastewater from induction furnaces is likely to contain suspended solids and oil & grease. Waste waters from continuous casting operations result from spraying scale from the surface of the steel. As a result, effluent may contain suspended matter and oil.

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Water borne wastes from steel manufacturing result from scrubbing of the gas stream to prevent air pollution and from non-contact cooling.

Effluent obtained from steel division contains high level of total dissolved solids and COD. Moreover, heavy metals and ammonical nitrogen and traces of phenological compounds and cyanides may also be present in the wastewater.

The list of water pollutants due to steel production are:

- Classical pollutants (Suspended particulate matter & oxidizable substance) \ metalloids
- Metal oxides i.e. iron oxide
- Salts
- Hydraulic or lubricants
- Oil and grease
- Heavy metals

The liquid pollutants generated in the proposed Rolling Mill are described below:

- Process wastewater generation
- Oil and grease from the oil skimmer in the scale pit and settling tank
- Blow down from contact water system

5. CCM's water, power and medium consumption and requirement

5.1 Water quality requirement

Table 1: water quality requirement

Water quality requirement	Unit	Clean recycling water	Muddy recycling water
Carbonate rigidity (CaCO_3)	mg/l	≤ 150	≤ 280
PH		7~9	7~9
Suspension matters	mg/l	≤ 50	≤ 50
Dia of Max granule in Suspension obstacles	mm	≤ 0.2	≤ 0.2
Total salt content	mg/l	≤ 400	≤ 400
Sulphate (SO_4^{2-})	mg/l	≤ 200	≤ 600
chlorid (Cl^-)	mg/l	≤ 200	
silicate (SiO_2)	mg/l	≤ 40	≤ 200
Total iron	mg/l	0.5~3	
Oil	mg/l	≤ 2	≤ 15

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5.2 Requirement on water supply

Table 2: Requirement on water supply for 2 strands

Equipment name	Water consumption (m ³ /h)	Water temperature °C		Pressure at using point (MPa)		Using method	Consumption %
		Inlet water	Outlet water	Inlet water	Outlet water		
Mould's cooling water (clean recycling water)	360	≤35	≤45	≥0.8	0.25~0.35	Enclosed loop	2
Equipment's cooling water (muddy recycling water)	180	≤40	≤55	≥0.3		Open loop	5~10
Secondary cooling spraying water (muddy recycling water)	180	≤40		≥0.8		Open loop	5~10

We have improved our water treatment systems. We have installed DAF system which reduces COD/BOD, and other toxic effluent levels in the water. We have also installed skimmers to remove oil contents from water. The state of the art pipes has been laid to carry water into concrete ponds from DAF system. Here chemical treatment is rendered to the water in different concrete ponds laid all along for the flow of water.

Details where it is finally disposed of after treatment.

It goes to SCRAP-VI Drain, under control of HQs Engineers 5 Corps. Secondly, as the water is cleaned to the extent that different farmers along the water channel use the treated water to irrigate the crops, animal and domestic use.

ES.5 NAME OF THE ORGANIZATION PREPARING REPORT

In keeping view with the regulatory requirement of the country, management engaged **Environmental and Social Technical Services (ESTS)** to undertake an Environmental Impact Assessment (EIA).

ES.6 A BRIEF OUT LINE OF THE PROPOSAL

The waste water treatment plant project is designed to meet Punjab Environmental Quality Standards (PEQS) along with all other requirements as imposed by the Environmental laws and regulations of local bodies.

Thus, the proposed project will operate in compliance with Punjab Environmental Quality Standards (PEQS).

- All workers will be provided with Personal Protective Equipment's (PPEs) e.g. ear covering and wear glasses while working on waste water treatment plant project.
- Medical checkup of all workers will be done after a specific time period (may be quarterly).
- Plantation will be carried out in the surrounding area as it can absorb noise and air pollution and improve environment.
- Noise pollution from machinery will be controlled or managed properly.
- Extensive plantation shall be done to improve/enhance the environmental scenario of the waste water treatment plant project.

The proposed project will involve the provision waste water treatment plant project within premises of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan to treat waste water in environmental friendly manner. It has no adverse impacts on the locality. It helps to enhance environmental friendly atmosphere.

The fire-fighting system covers fire detection and protection system for the project. The system will include the following:

- Fire-fighting water supply system
- Indoor and Outdoor hydrants system
- Fixed water spray system
- Fire Extinguishers
- Fire detection and alarm system

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According to the Environment Protection Agency, Government of the Punjab, Lahore Review of IEE and EIA Regulations 2022 “List of Projects Requiring an EIA”, **Schedule II G WATER SUPPLY AND TREATMENT (water supply and treatment plants with total cost more than 50 million)** said project under consideration falls in the category of the projects requiring Environmental Impact Assessment (EIA). Further, the client is required to fulfill the legal requirements of the Section-12 of the Pakistan Environmental Protection Act 1997.

ES.7 THE MAJOR IMPACTS

The overall impacts of the proposed project can be considered positive. However, it may pose some minor and moderate negative social and environmental impacts which will require proper mitigation measures during treatment.

Therefore, the intended measures are directed towards the mitigation of the identified adverse impacts. Some of the impacts are listed below:

- Likelihood of backend impacts relating to consumption of natural resources including water for various process and non-process operations.
- Likelihood of impacts relating to generation of sanitation wastewater from toilets and washrooms at the proposed project site if disposal will be improper.
- Likelihood of impacts relating to occupational health, worksite safety and non-insurance of the workers against the risks of job injury and resultant consequences.

There will be some generation of the ordinary food-based wastes and food residues resulting from consumption of food and eatables by the site workers taking their meals at the project site. Additionally, there will be generation of sanitation wastewater from the worksite toilets at the project premises.

A brief description of the various likely impacts follows hereunder:

- **Impacts of Land Use Change:** The proposed site for treatment plant is owned by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. Thus, no

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permanent impacts of land use change are expected, as the land surrounding the project site is not under any productive agricultural usage. Therefore, it would not involve any land use change. (*Activity devoid of any environmental or social impact*).

- **Impacts on Local Ecology, Biodiversity and the Habitat:** No Impacts as this aspect will be totally irrelevant to the proposed site for waste water treatment plant and due of its geophysical location; there will be no likelihood of damage to the local flora and fauna. (*Aspect/Activity devoid of any adverse environmental or social impact*).
- **Likelihood of Worksite Risks and Personal Injuries:** Non-observance of the standard procedures and non-compliance of the precautionary measures (like smoking on worksite, wearing loose cloths and avoiding the safety equipments) may render the workers prone to higher chances of emergency accidents. (*Aspect/Activity devoid of any adverse environmental or social impact*).
- **Loss of Livelihood and Structural Damages:** No impacts are related to loss of livelihoods of the neighboring residents, landowners or farmers or any structural damage. As the proposed site is adjacent to Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan, therefore there is neither any human population nor any built-up sites upto considerable distance from the proposed project site. (*Activity devoid of any environmental or social impact*).
- **Impacts of Inadequate Disposal of the MSW:** No impacts related to generation and disposal of municipal solid wastes (MSW). The main solid pollutants within the proposed waste water treatment plant (sludge) will be collected and dispose off properly. Therefore, there will be not any adverse environmental impact. (*Aspect/Activity devoid of any adverse environmental or social impact*).
- **Impacts on Groundwater:** Very minimal impacts relating to abstraction and consumption of groundwater. Additionally, small amount of freshwater will be

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required for drinking by the staff employed at the proposed project site premises or sanitation needs. (*Aspect/Activity devoid of any adverse environmental or social impact*)

- **Impacts on Surface Water:** No impacts on the nearby surface water as the waste water treatment plant will be devoid of any interaction with the surface waters of the proposed area. (*Aspect/Activity devoid of any adverse environmental or social impact*).
- **Impacts of Inadequate Treatment and Disposal of Wastewaters:** No impacts are related to generation, inadequate disposal and treatment of the wastewater as the effluent obtained from waste water treatment plant will be used to irrigate grassy lawns. (*Aspect/Activity devoid of any adverse environmental or social impact*).
- **Cutting and Removal of Trees and Crops:** No impacts relating to cutting or removal of trees and crops. There are no standing crops or trees at the project site. However, the management will intend to plant large number of trees at the proposed area as a part of external development and landscaping of the surroundings of project area. (*Aspect / Activity devoid of any adverse environmental or social impact*).
- **Likelihood of Land Instability:** Addition of proposed waste water treatment plant by already existing Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan will not cause any impact on soil instability from any of its activities, also this aspect is totally irrelevant to the project's geographical setting. (*Aspect/Activity devoid of any adverse environmental or social impact*).

A detailed account of the genesis of the above-referred adverse impacts, their potentiality to affect the ambient environment and the measures for their mitigations has been presented in this EIA Report. However, it would be suffice here to state that if the project activities at the site are carried out in a sustainable manner and in

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accordance with recommendations of the EMP and other relevant mitigation measures, as are given in this EIA study; then the majority of these adverse impacts would become insignificant and of no relevance at all.

The above-mentioned environmental impacts are of no significance and therefore not alarming in any way. Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan has already implemented all the suggested mitigation measures and directions of the EPA-Pb.

ES.8 RECOMMENDATIONS FOR MITIGATION MEASURES

The report details a set of comprehensive mitigation measures and strategies for avoiding and countering the adverse environmental and social impacts of the project. In addition to the preventive measures for warding off the adverse impacts, corrective measures have also been suggested for all and various project activities at the proposed project area to address the adverse impacts. The majority of the mitigation measures, as suggested in the EIA report. The report contains a set of comprehensive mitigation measures and the strategies for avoiding or addressing the adverse environmental impacts of the project's construction and subsequent operation phase. Unwanted water usage during construction can be avoided by relying on conservation practices of water use, such as curing the masonry and concrete structures with wet gunny wraps instead of direct showering of water streams on them. Impacts on surface-water and ground-water quality can be mitigated by avoiding direct discharge of the untreated sanitation effluents onto lands or into freshwater channels.

The mitigations relating to construction stage of the project at its former site included the following:

- Preparation of the tailored checklists for checking propriety of each and every activity in a systematic manner.
- Identification of alternate routes in case of temporary blockade of the approach road.

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- Preferring to carrying out noisy activities at the proposed waste water treatment plant during daytime hours, and
- Isolating the worksite with some dense material.
- Plantation will be taken up along the approach roads and vicinity of proposed project site.

The management will be taken appropriate measures for the worksite safety, and therefore, no impacts relating to construction of project and consequently no mitigations measures required.

ES.9 ENVIRONMENTAL, SOCIAL & DISASTER MANAGEMENT PLAN (ESDMP)

The environmental management plan (EMP), as given in this report, provides a mechanism for implementing the preventive and the corrective mitigation measures along with list of the authorities and the focal persons responsible for their implementation. The mitigation guidelines are the result of lengthy deliberations over various issues made with the relevant stakeholders and the regulatory agencies. The primary objective of the EMP is to prevent and attenuate the adverse impacts to an acceptable level by adopting suitable administrative or technical options.

ES.10 PROPOSED MONITORING

The environmental monitoring is an essential tool for testing environmental performance of the proposed project and ascertaining whether environmental mitigation recommendations are meeting their goals. The prime objectives of the environmental monitoring are:

- To check whether mitigation and environmental enhancement measures are adequate, effective and are actually implemented.
- To ensure compliance with legal and community obligations including observance of safety procedures at the construction sites.

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- To provide the means whereby impacts which were uncertain at the time of preparation of the report, or which could not be assessed, can be identified and steps taken to adopt appropriate corrective measures.
- To improve the approach for alike projects, i.e. to provide information on the actual nature and extent of the key impacts and effectiveness on mitigation and enhancement measures in order to improve the planning and execution of similar projects in the future.

The implementation and success of the EMMP will be verified through compliance monitoring of the various proposed project activities and the recommendations of the monitoring plan. The primary purpose of the environmental compliance monitoring or the post project auditing is to ensure that the process operations follow conditions of the Environmental Approval issued by the EPA-Pb.

ES.11 PROPOSED IMPACTS AND THEIR MITIGATION MEASURES

Environmental Aspects	Impacts and Mitigation Measures	
	Impacts	Mitigation Measures
Environmental Aspects	During construction Phase, through the use of locally available materials including cement, building blocks, metals, concrete, electrical cables, etc. The project continues towards the growth of economy by contributing to the gross domestic product.	• No mitigation measures required.
Employment Opportunities	• With the implementation of the project, there are employment opportunities for casual workers from the local community. The exact number of workers to	• No mitigation measures required.

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	be hired will depend on the magnitude of construction activities. • Unskilled workers also gain some skills that will help them in the future.	
Relocation of Utilities	The construction of the project will not relocate the existing public utilities. Hence, no rehabilitation or site restoration will be required.	• No mitigation measures required.
Noise Pollution	The construction works, delivering building materials by heavy trucks and the use of machines and equipment such as concrete mixers will contribute to high level of noise within the construction site and the surrounding area.	• Regular maintenance of the electric parts will be carried out • Unnecessary blowing of horns will be strictly prohibited. • Workers will be provided with personal protective equipment in areas of high noise levels.
Sludge Management	From WWTP, sludge will be generated which will be dried before its final disposal. The foul smell will be generated during the drying process which may cause nuisance from surrounding community.	• Proper sludge disposal measures such as from existing established methods and standards should be adopted. • Aerobic decomposition will be carried out which will prevent production of H₂S gas. • To control foul smell, thin layering (2-3 cm) for sludge will be dried this will promote aerobic condition. • During drying sludge aeration can be done regularly to control foul smell. • Trees will be planted along the project area boundary to mitigate odor. • After secondary treatment sulfur compounds will be reduced significantly. This will reduce the smell.

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		• Establishing and enforcing environmental, safety and health procedures for the construction and operation of the sludge facilities. • Regularly updating of the plan to reflect upon the current situation at the treatment plant, its characteristics and revised disposal strategies.
Odor	The treatment technology adopted has been designed to prevent the production of any foul gases (i.e. hydrogen sulfide) due to the chemical and biological reactions taking place. Thus, there will be no significant generation of odor.	• An appropriate action plan should be devised to deal with blockages or leaks as quickly as possible. • It must be ensured that appropriate spares, in terms of fittings and other mechanical components are available at all times. • Regular maintenance should be carried out. • Tankers should be well equipped with efficient extraction capacity such that the sludge hauling process should be done as quickly as possible. • Dewatering of sludge should be done • The sludge hauling process should not be carried out during peak hours, week days and on windy days. • Different species of trees should be planted in the vicinity of the treatment plant. They will act as buffer zones.

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ES.12 CONCLUSION

In conclusion, EIA of proposed project shows that with adoption of the proper environmental management and mitigation measures, the project will not have any adverse impact on any element of environment or the surrounding communities.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This report presents the Environmental Impact Assessment (EIA) Study titled as Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan (Addition of waste water treatment plant). The proposed project site is situated at Jetha Bhuta Khan pur, Rahim yar khan. This study has been carried out to estimate the likely environmental and social impacts during construction and operational phase and identify proper mitigation measures for reducing the adverse impacts on environment.

1.2 PURPOSE OF REPORT

The main objectives of this Environmental Impact Assessment (EIA) Report are to identify the baseline environmental, biophysical and socio-economic conditions, to examine project alternatives including alternate sites, and to study the potential impacts along with formulation of suitable mitigation measures for an environment friendly implementation of the proposed project and around the project area. The purpose of the EIA study is to identify the possible beneficial and adverse environmental impacts as presently envisaged and propose practical mitigation measures to be implemented during installation of the project to minimize the negative impacts of the waste water treatment plant. The specific stages and purpose of EIA are:

- Review of available documents;
- Collection of baseline data related to physical, ecological and social domains of environment;
- Overview of different Project Alternatives;
- Evaluation of project impacts on environment and social settings; Suggesting mitigation measures for adverse impacts;

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- Preparation of Environmental Management Plan (EMP); and preparation of Environmental Impact Assessment (EIA) Report.
- Guidelines for public participation.

The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing the Environmental Approval.

1.3 IDENTIFICATION OF PROJECT AND PROPONENT

a. CONTACT PERSON

Sikander Zulqernain

CNIC No. 35201-9032578-3

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0331-6583807

b. DETAILS OF CONSULTANT

Name of Organization	Environmental and Social Technical Services (ESTS)
Email	<u>hsb.obaid@gmail.com</u>
Address	215, B-Block, Faisal Town, Lahore Pakistan

List of team is annexed.

1.4 PROJECT LOCATION

Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan is already working since 1963. Now, the management has proposed to set a waste water treatment plant at Jetha Bhuta Khan pur, Rahim yar khan. It is well-connected to Shahi Road, District Rahim yar Khan.

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The proposed project site for waste water treatment plant is adjacent to Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and surrounded by many industries of national importance.

1.5 BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF PROJECT

The management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan intends to set up a new integrated state of the art waste water treatment facility.

The pollution load will be reduced significantly by installing proposed project. The site selected site is under the ownership of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. The total project cost is PKR _____ Million (cost undertaking is annexed).

1.6 NEED FOR ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Pakistan Environmental Protection Act 1997 (PEPA-97) Clause 12, stipulates that the “Proponent of any development Project will have to submit Environmental Assessment Report (EIA or IEE, whichever is applicable) to the concerned Environmental Protection Agency to obtain its approval prior to start of construction and operation of the Project”.

Construction of this project has been judged to fall under Schedule II of IEE/EIA Regulations 2022 and requires submission of EIA report prior to construction. To ensure compliance with the lawful provisions of section 12 of PEPA 1997, rules and regulations made there under, this EIA report has been prepared for obtaining environmental approval under section 12 of PEPA 1997 from EPA Punjab.

1.7 OBJECTIVES AND SCOPE OF WORK

The main objectives of the study are to identify the environmental impacts due to the construction of the project and to suggest appropriate measures to mitigate the adverse

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impacts of this proposed project. The primary objective of this environmental and social impact study relating to the proposed waste water treatment plant is to examine, compare, review and analyze the parameters. Another objective is to review the mitigation measures with respect to their relevance, efficacy and adequacy in addressing the identified impacts of the project and to suggest appropriate modifications therein, if so warranted.

Another objective is to carry out a comprehensive and all-encompassing review of the Mitigation Guidelines and the Environmental and Social Management and Monitoring Plan (ESMMP).

The scope of the work for the EIA study can be summarized as under: Identification of the existing physical, biological and socio-economic aspects. Identification of probable impacts of the project:

- Determination of the significant impacts during construction.
- Recommendations for the implementation of mitigation measures.
- Development of a detailed Environmental Management Plan (EMP)

It is hoped that findings of the instant study will help in avoiding and averting the negative impacts of the project to render it an environment friendly and environmentally compliant facility.

1.8 APPROACH AND METHODOLOGY OF EIA STUDY

Environmental Impact Assessment (EIA) is conducted under the legal framework of Pakistan Environmental Protection Agency (PEPA). As per legal requirements, the project will be reviewed in the light of the provisions of Pakistan Environmental Protection Act, 1997 and Pakistan Environmental Assessment Procedures, issued by Pakistan Environmental Protection Agency (Pak-EPA).

Secondary information for this EIA Study was collected from relevant departments/personals and literature to establish physical, socio-economic and environmental profile of the project area. Relevant secondary information available

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with the proponent on the physical, technical and institutional aspects of the proposed project was also utilized. Architect and Engineers of the project were also consulted for obtaining information about various features of the project. Interviews and direct consultations with the stakeholders were held. The secondary sources of data and information included the office record of the proponent, information on the project as available with the EPA-Pb, relevant websites and a few other similar sources of information.

1.9 ENVIRONMENTAL, SOCIAL & DISASTER MANAGEMENT & MONITORING PLAN (ESDMP)

The Environmental, Social & Disaster Management & Monitoring Plan (ESDMP) provides a mechanism for implementing the preventive and mitigatory measures in the form of suitable environmental guidelines. The main objectives of the ESDMP are firstly to prevent and wherever it is not possible, to attenuate the adverse impacts to an acceptable level by adopting suitable administrative and technical options. The key components of the ESDMP include the environmental and social guidelines to be implemented by the project authorities, the construction contractor and all other concerned. The ESDMP also outlines the institutional setup for implementing the mitigation guidelines i.e., designating a focal person by the proponent (usually the project's Environmental Manager) for managing environmental and social impacts of the various project activities at the appropriate managerial levels.

1.10 ESDMP'S IMPLEMENTATION COSTS

Costs involved in implementing the ESDMP will pertain mainly to expenses on training and external monitoring of the project's environmental and social performance. Because of involvement of number of variables, it is not possible at this stage to work out the exact financial outlay of these activities. However, as a tentative estimate, it is expected that holding of a single 1-day workshop will cost about Rs. 0.11 million. Since, two such works are required.

CHAPTER – 2

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

This section provides an overview of the policy framework and national legislation that applies to the project. The project is expected to comply with all national legislation relating to environment in Pakistan, and to obtain all the regulatory clearances required.

2.2 NATIONAL POLICY AND ADMINISTRATIVE FRAMEWORK

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.

The core areas that are relevant in the context of the project are pollution control, prevention and abatement, increasing energy efficiency, conserving biodiversity, supporting forestry and plantations, and the preservation of cultural heritage.

Two organizations, the Pakistan Environmental Protection Council (PEPC) and the Pakistan Environmental Protection Agency (Pak-EPA), are primarily responsible for administering the provisions of the Pakistan Environmental Protection Act, promulgated by the Government of Pakistan in 1997. The PEPC oversees the functioning of the Pak-EPA. Its members include representatives of the government, industry, non-governmental organizations, and the private sector. The Pak-EPA is required to ensure compliance with the PEQS and establish monitoring and evaluation

systems. As the primary implementing agency in the hierarchy, it is responsible for identifying the need for, as well as initiating legislation whenever necessary. The Pak-EPA is also authorized to delegate powers to its provincial counterparts, the provincial EPAs (Environmental Protection Agencies). One of the functions delegated by the Pak-EPA to provincial EPAs is the review and approval of environmental assessment reports of projects undertaken in their respective jurisdictions.

2.2.1 Pakistan Environmental Protection Act, 1997

The Pakistan Environmental Protection Act, 1997 (1997 Act) empowers the Pak-EPA to:

- Delegate powers, including those of environmental assessment, to the provincial EPAs.
- Identify categories of projects to which the IEE/EIA provision will apply.
- Develop guidelines for conducting initial environmental examinations (IEE) and EIAs and procedures for the submission, review and approval of the same.
- Develop environmental emission standards for parameters such as air, water and noise.
- Enforce the provisions of the Act through environmental protection orders and environmental tribunals headed by magistrates with wide-ranging powers, including the right to fine violators of the Act.

Under the provisions of the 1997 Act, the Pak-EPA has empowered four provincial EPAs to manage the environmental concerns of their respective provinces. The provincial EPAs can frame environmental regulations tailored to the requirements of their province, provided these regulations meet or exceed the minimum standards set by the Pak-EPA. Provincial EPAs are required to review and approve EIAs of all development projects undertaken in their respective provinces, including those projects implemented by federal agencies.

2.2.2 Regulations for Environmental Assessment

Under Section 12 (and subsequent amendment) of the 1997 Act, a project falling under any category specified in Schedule I (SRO 339 (10/2000)), requires the proponent to file an EIA with the federal agency concerned (the Pak-EPA). Projects falling under any category specified in Schedule II require the proponent to file an EIA with the federal agency. Within ten working days of the IEE or EIA having been deposited, the federal agency will confirm that the document submitted is complete for the purpose of review. During this time, should the federal agency require the proponent to submit any additional information, it will return the IEE or EIA to the proponent for revision, clearly listing those aspects that need further discussion. Subsequently, the federal agency shall make every effort to complete an IEE review within 45 days and an EIA review within 90 days of filing.

Recognizing that the Pak-EPA has delegated powers to the provincial EPAs to enforce the provisions of the 1997 Act, an EIA must be submitted to one of the relevant Provincial EPA based on the location of the project.

At the time of application, the project proponent is also required to pay a specified fee to the EPAs concerned.

2.2.3 Guidelines for Environmental Assessment

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 project are listed below, followed by comments on their relevance to the project:

Guidelines for the Preparation and Review of Environmental Reports, Pakistan Environmental Protection Agency, 1997

The guidelines on the preparation and review of environmental reports target the project proponents, and specify:

- ✓ The nature of the information to be included in environmental reports

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- ✓ The minimum qualifications of the IEE/EIA conductors appointed
- ✓ The need to incorporate suitable mitigation measures at every stage of project implementation
- ✓ The need to specify monitoring procedures.

The terms of reference for the reports are to be prepared by the project proponents themselves. The report must contain baseline data on the project area, a detailed assessment thereof, and mitigation measures.

Guidelines for Public Consultation, Pakistan Environmental Protection Agency, May 1997

These guidelines deal with possible approaches to public consultation and techniques for designing an effective program of consultation that reaches out to all major stakeholders and ensures that their concerns are incorporated in any impact assessment study.

Sectoral Guidelines Pakistan Environmental Assessment Procedures, Pakistan Environmental Protection Agency, October 1997

The guidelines for 'Major Chemical and Manufacturing plants' are structured to assist in identifying key environmental issues related to various Chemical and Manufacturing Plant, as well as the various mitigation measures and alternatives that should be considered and applied accordingly.

2.2.4 Punjab Environmental Quality Standards

The Punjab Environmental Quality Standards (PEQS), specify the following standards:

- Maximum allowable concentration of pollutants (32 parameters) in municipal and liquid industrial effluents discharged into inland waters, sewage treatment facilities, and the sea (three separate sets of numbers)
- Maximum allowable noise levels from vehicles.

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- 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.

These standards also apply to the gaseous emissions and liquid effluents generated by generator, process waste etc. The standards for vehicles will apply during the construction as well as operation phase of the project. Standards for air quality have not been prescribed as yet.

2.2.5 National Resettlement Policy and Ordinance

There is no such kind of land acquisition. Therefore, no further details have been discussed.

2.3 INTERACTION WITH OTHER AGENCIES

The client is responsible for ensuring that the project complies with the laws and regulations controlling the environmental concerns. This chapter describes the nature of the relationship between the client and line departments concerned.

2.3.1 Federal and Provincial EPAs

The client will be responsible for providing the complete environmental documentation required by the Pak-EPA, and Punjab Environmental Protection Department (EPD) and remain committed to the approved project design. No deviation is permitted during project implementation without the prior and explicit permission of the EPAs concerned.

2.3.2 Provincial Revenue and Other Departments

Since the issue of land acquisition and contacts with Agriculture, Horticulture and Forestry Department are not involved in this project, hence they are not elaborated.

2.3.3 Provincial Governments

The client must ensure that the project meets the criteria of the Punjab provincial government as related to the safe disposal of wastewater, solid waste, and toxic materials. The client will coordinate and monitor environment-related issues.

2.3.4 Local Government and Municipalities

The client will work with local government/administration and municipalities on the resettlement of squatters and removal of encroachments or sources of congestion if any. In such cases, the Client will frame an agreement with the municipality, local government, or other service provider concerned on the resettlement of displaced squatters.

2.4 OTHER ENVIRONMENT-RELATED STATUTES

This section outlines statutes apart from the Pakistan Environmental Protection Act, 1997, which are relevant to the project.

2.4.1 Antiquities Act, 1975

The Antiquities Act relates to the protection, preservation and conservation of archaeological/historical sites and monuments. It prohibits construction (or any other damaging) activity within 200 m of such sites unless prior permission is obtained from the Federal Department of Archaeology and Museums. The Antiquities Act also binds the project proponent to notify the department should anything of archaeological value be excavated during project construction.

2.4.2 Provincial Local Government Ordinances, 2001

These ordinances, issued following the devolution process, establish regulations for land use, the conservation of natural vegetation, air, water, and land pollution, the disposal of solid waste and wastewater effluents, as well as matters related to public health and safety.

2.4.3 Pakistan Penal Code, 1860

The Pakistan Penal Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code empowers the local authorities to control noise, noxious emissions and disposal of effluents. The PEQS enforced by the EPAs supersede the application of this legislation on industries and municipalities. The Penal Code, however, can provide a basis for the client to coordinate its activities with the local authorities to ensure that its construction activities do not become a cause of public nuisance or inconvenience.

2.4.4 The Cutting of Trees (Prohibition Act), 1975

Section 3 of this Act states “No person shall, without the prior written approval of the local formation commander or an officer authorized by him in this behalf, cut fell or damage or cause to cut, fell or damage any tree.”

2.4.5 The Protection of Trees and Bush wood Act, 1949

This Act prohibits cutting or chopping of trees and bush wood without permission of the Forest Department.

2.4.6 Labour Laws

The Constitution of Pakistan contains a range of provisions with regards to labour rights found in Part II: Fundamental Rights and Principles of Policy.

Article 11 of the Constitution prohibits all forms of slavery, forced labour and child labour;

Article 17 provides for a fundamental right to exercise the freedom of association and the right to form unions;

Article 25 lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone;

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Article 37(e) makes provision for securing just and humane conditions of work, ensuring that children and women are not employed in vocations unsuited to their age or sex, and for maternity benefits for women in employment.

Under the Factories Act, 1934 no adult employee, defined as a worker who has completed his or her 18th year of age, can be required or permitted to work in any establishment in excess of nine hours a day and 48 hours a week. Similarly, no young person, under the age of 18, can be required or permitted to work in excess of seven hours a day and 42 hours a week.

2.4.7 The Punjab Plantation and Maintenance of Trees Act, 1974

The proponent shall be responsible for protecting and maintaining the plants and trees present in the land owned by him.

2.5 INTERACTION WITH OTHER DEPARTMENTS

The Proponent is responsible for ensuring that the project complies with the laws and regulations controlling the environmental concerns of the construction and operation stages. This section describes the nature of the relationship between the Proponent and the concerned line departments.

2.5.1 Environmental Protection Department (EPD), Punjab

The Proponent will be responsible for providing the complete environmental documentation required by EPD, Punjab and remain committed to the approved project design. No deviation is permitted during the project implementation without the prior and explicit permission of the EPD, Punjab.

2.5.2 Forest and Wildlife Departments, Punjab

As the implementation of the project does not involve the clearing of vegetation and trees within the project area, and no wild life sanctuary exist in the project area, so no

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clearance from forest and wildlife departments is envisaged. However, for evaluation of trees owned by private owners may require the involvement of Forest Department.

2.5.3 Revenue Department, Punjab

Under the national law, matters relating to land use and ownership are provincial subjects, and the revenue department of the concerned province is empowered to carry out the acquisition of private land or built-up property for public purposes, including on behalf of another provincial or federal agency. For this purpose, the lead department must lodge an application with the concerned provincial government to depute a land acquisition collector (LAC) and other revenue staff, who will be responsible for handling matters related to the acquisition and disbursement of compensation.

2.5.4 District Government

The Proponent and its contractors must ensure that the project meets the criteria of district government as related to the establishment of construction camps and plants, and the safe disposal of wastewater, solid waste, and toxic materials.

2.5.5 Water and Power Development Authority (WAPDA)

In case of relocation of any EHV or HV transmission lines, distribution lines, the proponent have to apply to the WAPDA for NOC and relocation of transmission lines as per WAPDA regulations. Similarly, to get new connections for the Project to meet the electricity requirements, Proponent may also have to coordinate with WAPDA.

2.5.6 Pakistan Telecommunication Company ltd. (PTCL)

If relocation of telephone poles, optic fiber cable, co-axial cable, etc. will be involved in the project, or election of facilities will be required, Proponent have to coordinate with PTCL and fulfill the regulatory requirements.

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2.5.7 Sui Northern

In case of relocation of existing gas pipelines or to get new connection, Proponent has to coordinate with Sui Northern Department.

2.5.8 Pakistan Railway

In case project crosses the existing railway track, Proponent has to coordinate with Pakistan Railway and get NOC.

2.5.9 Public Health Department, Punjab

For proper disposal of storm as well as sewage water, the Proponent will have to coordinate with Public Health Department, Punjab.

CHAPTER 3

DESCRIPTION OF PROJECT

3.1 TYPE AND CATEGORY OF PROJECT

Proposed waste water treatment plant will be added by already existing “Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan” Project falls under the category of Review of EIA / IEE Regulations 2022, **Schedule II G WATER SUPPLY AND TREATMENT (water supply and treatment plants with total cost more than 50 million)** projects requiring an EIA Report for its Environmental Approval under section 12 of the Act.

The project falls under Schedule-II of the IEE/EIA Regulations, 2022 notified by Government of Pakistan. Thus PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (REVIEW OF IEE AND EIA) REGULATIONS, 2022, projects requiring an EIA the Regulations governing the functioning of the EPA’s with respect to the IEE and EIA reports.

The pollution load will be reduced significantly by installing proposed project. The site selected site is under the ownership of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. The total project cost is PKR ____ Million (cost undertaking is annexed).

3.2 OBJECTIVES OF PROJECT

The overall aim of proposed project is to reduce the pollution load, protect the freshwater from contamination and to promote water conservation by reusing/recycling wastewater after treatment. After proposed treatment, the water can be reused in process, domestic & horticultural activities. Moreover, following objectives will be achieved by implementing design for the treatment of wastewater;

- To treat wastewater and comply with PEQS
- To make water able to reuse after treatment
- To adopt water conservation measures
- To improve and protect the surrounding environment

3.3 ALTERNATIVES CONSIDERED REALISTICALLY AND REASONS FOR THEIR REJECTION

The consideration of alternatives to any project is one of the key aspects of an environmental study. Consideration of the alternatives provides for the examination of different options to achieve a stated objective and assist the decision makers in the choice of the best option, which has the least adverse and the greatest beneficial environmental, social and economic consequences. Different alternative sites were considered for the proposed WWTP project by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.

Keep the following points in mind while selection of project site.

- Free land availability as site is owned by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.
- Minimum environmental adverse impacts
- No resettlement and land acquisition.
- No issue regarding this project to all adjacent land owners
- Cost effective solution
- Easily approachable for prospective
- Low cost of material handling, due to straight and short route and absence of back tracking.
- Continuous flow of work

Reasons of Rejection

Such a large piece of land is not available for its project in the vicinity.

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- Such land is very costly but this land is owned by management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.
- The access to road is not easy available.
- Area falls within the residential sector.
- Area was too congested.
- Involved rehabilitation and relocation of the locals.
- Traffic jam issues during peak and rush hours.
- Suitability of land

Basis of Selection of Site

Provision of WWTP within the premises of already existing Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan is the best option for proposed project. A critical analysis based on accessibility of available site, accessibility of site, availability of water resources, less damage to existing environment and other minimum environmental problem was made. Finally selected site of project is more practicable with respect to economic, social and environmental perspective and future development. Some of the factors that were kept in mind during site selection for the project:

Sources Vulnerability

- Land availability with no cost as site is owned by the management.
- Access to an ample supply of suitable water
- Access to power supply mainline.
- Accessable all-weather roads.
- Suitability of soils and topography for construction.
- Access to main cities of the country.
- Location in relation to labor force available for WWTP.

There are no nearby settlements nor there is any issue of land compensation. Therefore, proposed site for WWTP by existing Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan has been selected.

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The selected proposed site for the project will be located along Shahi Road, RYK so it is well-connected to main road. Therefore, the land selected is best suitable for the development of project.

3.4 LOCATION AND SITE LAYOUT OF THE PROJECT

The WWTP is proposed to be added at Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan, site will be adjacent to sugar mills.

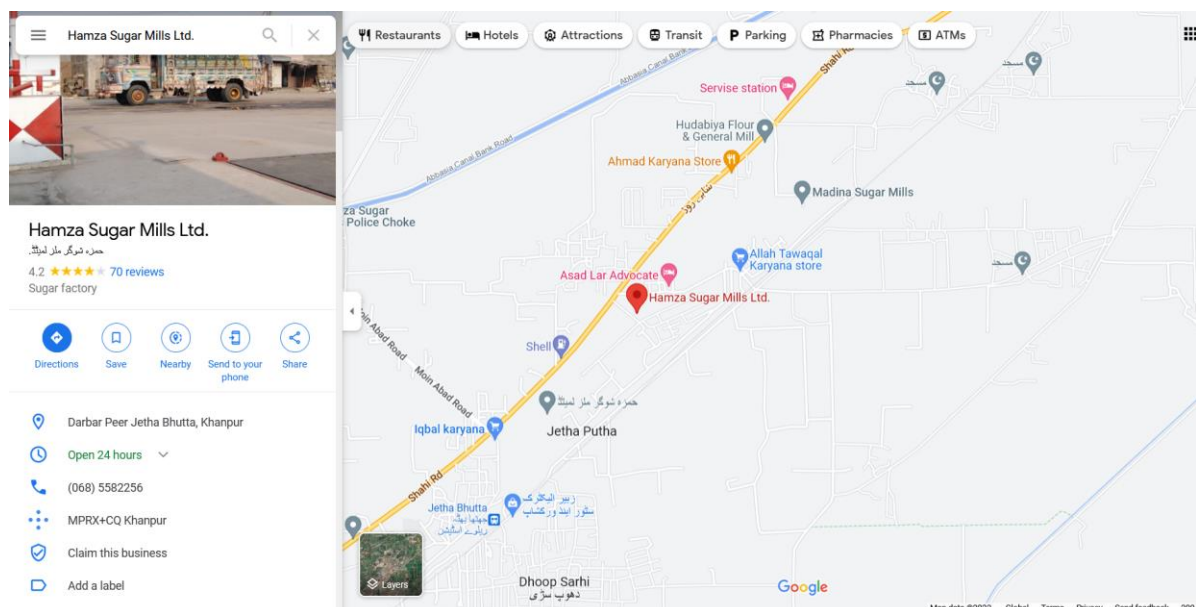
The proposed location map on Google imagery and layout site of project is annexed at the end of report.

3.5 LAND USE ON THE SITE

The proposed site is open land / industrial within the existing facility of M/s Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.

3.6 ROAD ACCESS OF PROJECT SITE

The proposed site for treatment plant will be adjacent to Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. It is well-connected to Shahi Road. The road access for the proposed project is given below:



3.7 VEGETATION FEATURES OF THE SITE

Once rich in natural vegetation the land use pattern of the Indus Basin and other areas has greatly been modified for want of land for cultivation. This has changed the pattern of flora wherever irrigation was possible.

After clearing the Tropical Thorn Forests, using canal water irrigation, better areas were cultivated.

The district's flora consist of jand (Prosopis spicigera), karir (Capparis aphylla), beri (Zizyphus jujuba), van (Salvadora oleoides), kikar (Acacia nilotica), shisham (Dalbergia sissoo) and aak (Calotropis spp). Various herbs are also found, including harmal, akrey and bathoo.

Main tree species grown are Shisham (Dalbergia sissoo), Morus alba (Mulberry), Populus Spp. (Poplar), and Eucalyptus camaldulensis (sufaida).

Indigenous flora includes Prosopis cineraria, Tamarix aphylla, Capparis aphylla and Salvadora oleoides with undergrowth of Chenopodium album, and Cannabis sativum.

3.8 COST AND MAGNITUDE OF OPERATION

Extent of operation will be the addition of waste water treatment plant by sugar mills. However, the cost affidavit (total cost of the project is _____million pkr) is annexed at the end of the report.

The magnitude of operation is to treat waste water of sugar industry.

3.9 SCHEDULE OF IMPLEMENTATION

The implementation stage of proposed project activity is described below:

1st Stage comprises (Completed):

- The onsite contouring studies and soil investigations.

2nd Stage comprises the following tasks: (2 years)

- Laying of foundations excavation and commencement of erection work.
- Start of civil, electrical and mechanical work.
- Electrical engineering tasks
- Development of basic infrastructure
- Refurbishing and erection of mechanical parts of the waste water treatment plant.
- Fitting of instrumentation etc.

3rd Stage comprises the following tasks: (1 year)

- Plant equipment erection completion
- Completion of basic infrastructures; electricity supply etc.

4th Stage will be the commencement of regular operation. (1 year)

3.10 DESCRIPTION OF PROJECT / FLOW CHART OF PROJECT

Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan (The Company) was established in 1963 before promulgation of Pakistan Environmental Protection Act, 1997, keeping in view the requirements as well as burning demand of peasants. It is located at Jetha Bhuta Khan pur, Rahim yar khan, absolutely in conformity with the feasibility of this plant. The primary objective of the proposed project is that Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan is going to set up a new integrated state of the art waste water treatment facility. The management is conscious of its obligations for protecting the environment and has taken various measures for this purpose.

About Shandong Innovation Huayi

Shandong Innovation Huayi Environmental Engineering Co, Ltd. Is a new and high-tech enterprise specialized in environmental protection equipment, which is involved development, manufacturing, technological design, technical services. We specialized in more than 50 series of specifications of Environmental protection

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equipments, which contains Membrane bio-reactor Dissolved air flotation machine, domestic sewage treatment plant, sludge dewatering machine series, vacuum filter, belt filter press, sludge scraper garbage and incinerator etc. environmental equipments. Products passed ISO9001:2008 certificates. It is one of the key enterprises in Shandong environmental protection industry. The company brought in advanced technology and processing from VOITH, Finland parker etc international class enterprise. We pursue excellence for the quality of the products and the services, win together with customer, achieve continuous, fast and harmonious development. The Products was sold well throughout 29 cities, exported to many countries such as Indonesia, Malaysia, Vietnam, Bangladesh, Nigeria, Pakistan, Mexico, Venezuela etc. Advanced technology, Scientific and standardized management, Professional marketing team, which make your choices without worries.

Description of DAF

Dissolved Air Flotation (DAF) is a water treatment process that clarifies wastewater through the removal of suspended matter such as oil, greases, or solids. Removal is achieved by injecting pressurized air into the wastewater where micro-bubbles then interact with the suspended solid particles. This interaction causes these particles to float to the surface of the DAF where they are then scraped and separated.

Working Principles of DAF

The waste water feed into air flotation tank of tank is dosed with a coagulant (such as PAC, PAM) to coagulate the colloidal particles and/or flocculants to conglomerate the particles into bigger clusters.

A portion of clarified effluent water leaving the DAF tank is pumped into dissolved air tank which compressed air is also introduced. This process saturates pressurized effluent water with air under pressure. The wastewater with dosing mixing with gas solubilized water in mixing zone of DAF, the flocculate adhere the tiny air bubbles, and then flow into the air flotation tank. The flocculate form scum and rise to the surface, the scum will be scraped into sludge zone of DAF machine by skimmer and

then discharged. The treated water in the DAF machine flow into the the clean water tank, and part of treated water will backflow, part of treated water is discharged.

Application of OAF

- (1) Remove oil and TSS.
- (2) Separate small particles and algae in groundwater.
- (3) Recover valuable products in industrial sewage such as paper pulp.
- (4) Act as secondary sedimentation tank to separate and concentrate suspended particles and sludge.
- (5) For some industrial wastewater treatment such as slaughter house, printing textile and dyeing, leather, petrochemical and food industry industrial etc.

Features of DAI

- (1) System uses an integrated combination, reduce space requirements, small footprint, low energy consumption, easy installation and transportation.
- (2) Large capacity, high efficiency and small occupying space.
- (3) High degree of automation, Compact structure, easy operation and maintenance.
- (4) Dissolved air, high efficiency, treatment efficiency and stability, if necessary, adjust the dissolved gas pressure and dissolved gas and water recycle ratio.
- (5) Low noise compressor to solve the noise problem has long plagued the people.

Description of Infallajigal

- (1) Put the DAF on a level position after transporting the DAF to installation site.
- (2) Connect inlet pipe.
- (3) Treated water outlet can be connected to the sewer. And the water outlet can be directly connected with the next processing equipment (must be connected by valve).
- (4) Sludge outlet can be connected to the sludge tank or sludge treatment equipment.
- (5) The emptying hole is connected with the valve and the scum pipe.
- (6) Install the walkway and ladder.
- (7) Install the chemical dosing machine, and put the chemical mixing tank above the chemical storage tank (installed valves for chemical outlet).

(8) Electric cabinet can be installed in indoor to prevent rain and keep clean. all circuit are connected to the electric cabinet.

Preparation Work

- (1) Remove all dirt and debris in the air flotation tank and then close emptying valves.
- (2) Add lubricating oil to the parts of pump and air compressor.
- (3) Switching on the power, starting up the pump and checking whether the operational direction is consistent with the direction of the arrow. Starting up the air compressor and checking whether the operation of air compressor is normal.
- (4) Starting up the driving motor, make it running in the direction of air dissolved system and check the chain when it running.

Commissioning of feeding water

- (1) Feeding clean water to the DAF machine, and the water level in the air flotation tank up to the upper of partition of scum tank about 20-50mm. The water level could be controlled by outlet valve.
- (2) Turn on the inlet valve of air dissolved tank and Turn off all other control valves, Turn the knob switch to automatic position, turn on the reflux pump, the air compressor work automatic at the same time, And Look at the pressure gauge value rising gradually and turn on the outlet valve of air dissolved tank when the pressure gauge values reach to 0.2Mpa to make the dissolved air water release to the air flotation tank by release device. And then there are large number micro bubbles in the air flotation tank, which make the water into milky white, and it shows the air dissolved system is normal. Add some water if the treated water in the treated water tank can not meet the needed water level of reflux pump.
- (3) Chemical dosing: Put PAC (poly aluminium chloride) into chemical dosing tank after filled with clean water, and mixing 10 minutes and then stop mixing to make the chemical solution with about 10% concentration and then flow into the chemical storage tank for reserve. Put PAM (Polyacrylamide) into chemical dosing tank after filled with clean water and mixing 2hours, and then stop mixing to make the

chemical solution with about 2%0 concentration and then flow into chemical storage tank for reserve.

(4) Wastewater chemical dosing is transported to the mixing tank of DAF after air dissolved system working normal, Flow rate is smaller at first, and then increased to the rated value gradually after the normal operation.

(5) DAF stop working: First, turn off the feeding pump and outlet valve first, and skim all the scum on the surface of DAF tank, then turn off the reflux pump, air compressor and motor of skimming (we should put clean water in the clean water tank if the water in the clean water tank is not enough for reflux pump). Turn on the emptying valve and clean it by clean water if the DAF stop working long time. Turn on the clean water valve, working 30 minutes with clean water, and then turn off the inlet control valve and outlet control valve, finally turn off the clean water pump.

Daily maintenance

(1) The value of the pressure gauge that on the air dissolved tank must not exceed 0.6MPa.

(2) Reflux pump, air compressor and motor of skimming should be lubricated regularly. Generally, the air compressor is oil every two months, and the oil is replaced once in half a year.

(3) There is a lot of sediments is accumulated in air flotation tank after a long period of operation and should be cleaned regularly.

(4) Chemicals should be meet the wastewater quality, otherwise the treatment effect is not ideal.

(5) The test running must use clean water, and then the treated water by DAF machine will be reused as the return water after the operation of DAF is normal.

The diagram illustrates a wastewater treatment process. Wastewater enters from the top left at elevation +10.00 into a 'wastewater collection tank' which contains a 'floatable sewage pump'. The water then flows into a large 'DAF' (Dissolved Air Flotation) tank. Above the DAF tank, there are two 'dosing' stations: 'PAC dosing device' and 'PAM dosing device', both equipped with 'floating ball' float valves and 'metering pump's. An 'air compressor' feeds into the 'air dissolving tank' which is connected to the DAF tank. The DAF tank has a 'discharge line' and a 'hole for discharge scum'. It also features a 'cleaned water zone' and an 'outlet'. The DAF tank's dimensions are noted as 16000 (length) and 2600 (width). The effluent from the DAF tank goes into a 'cleaned water collection tank' at elevation +10.20. The scum is collected in a 'scum collection tank' at elevation +10.00. A legend indicates that a box with a cross represents a 'valve' and a box with a triangle represents a 'one way valve'. The diagram is titled '由 Autodesk 教育版产品制作' (Made by Autodesk Education Edition Product).

3.11 LIST OF PERSONAL PROTECTIVE EQUIPEMENT

All construction workers will be equipped with Personal Protective Equipment's (PPEs) safety boots, helmets, gloves and protective masks and will also monitor their proper and sustained usage.

In operational phase, workers will be provided with suitable Personal Protective Equipment's. For head protection, helmets will be given, for hands protection, suitable gloves and for feet protection, safety boots will be provided. Masks and ear plugs will also be provided. Workers will be provided PPEs whenever necessary.

The detailed Personal Protective Equipment's (PPEs) are annexed at the end of the report.

3.12 INVOLVEMENT OF LABORS DURING CONSTRUCTION PHASE

About 35 workers will be required to set a waste water treatment plant which includes 10 skilled workers and 25 unskilled workers.

3.13 JOB OPPORTUNITY

After completion of the project, 5 skilled and 3 unskilled labor will be employed for WWTP.

3.14 RESTORATION AND REHABILITATION PLAN

There will be no matter of rehabilitation as the site is already owned by the management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. During entire construction period, necessary precautions will be taken to ensure that no damage is done to the basic infrastructures cleaning and restoration will be carried out during and immediately after each phase of construction and it will be the responsibility of each team in their respective area. After completion; all construction matrix, debris and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spill ever from the project

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site will be cleared adequately. The land, if and where will be made neat and clean. In the event that the management becomes redundant rehabilitation plan will be produced and will be provided to the Director General, Environment Protection Agency at least three months prior to decommissioning.

3.15 GOVERNMENT APPROVALS

The previous Environmental clearance of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan, Certificate of Incorporation for Commencement of Business was obtained and annexed at the end of the report, **Annexure 2**.

However, Approvals from other concerned Government Departments will be obtained after getting Environmental Approval from EPA, Punjab.

CHAPTER 4

SOCIAL BASELINE

4.1 SOCIAL BASELINE CONDITIONS

4.1.1 Administrative Setting

Rahim Yar Khan comprises of 4 Tehsils, 3 Municipal Administration and Town Committee and 136 union councils. Project site is located in Rahim Yar Khan Tehsil. Its area is 1715 sq. km. and population was 985655 in the year 1998. Total (male and female) population consists of more than 90% Muslims and Majority is Punjabi. Total population of Tehsil is 274666, literacy ratio is 60.4, and education primary (Male + Female) is 46000, Matric & above is 39000. Housing pattern mostly pacca, potable water for 11774, and electricity, 32503 & latrine facility for 21919 persons. Average household size is 7.4.

4.2 SOCIAL INFRASTRUCTURE & ITS IMPACTS

4.2.1 Social Impacts

- a) Impacts which result in a change in the community's demographic structure
- b) Environmental impact that may cause substantial change or disruption to the community behavior (loss of neighbor cohesion, access to facilities, links to other communities, community identity or cultural character)
- c) Impacts which result in some individuals or communities being significantly being disadvantaged
- d) Impacts on the health, safety, security, privacy or welfare of individuals or communities because of factors such as:
 - (i) Air pollution, odor and noise
 - (ii) Vibration, blasting, electromagnetic fields or radiation
 - (iii) Release of disease or genetically modified organisms

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- (iv) Disease causes due to dust problem.
- e) Impacts that result in a change in the level of demand for community resources (e.g. facilities, services and labor force)
- f) Any other social impacts.

4.2.2 Heritage, Aesthetic, Cultural Impacts

- a) Impacts on a locality, place, project or natural landmark having aesthetic, anthropological, architectural, cultural, historical, scientific, recreational, scenic or social significance or other special value for present or future generations
- b) Any other heritage, aesthetic, cultural impacts

4.2.3 Land Use Impacts

- a) Any major changes in land use
- b) Any curtailment of other beneficial uses
- c) Any property value impacts with land use implications
- d) Any other land use impacts

4.2.4 Transportation Impacts

- a) Substantial impacts on existing transportation systems (road, pedestrian-both public and private), altering present patterns of circulation, modal split or movement of people and/or goods
- b) Directly or indirectly encouraging additional traffic
 - during construction
 - during operation
- c) Any other impacts on transport or traffic.

4.2.5 Temporary Land Acquisition

- a) Impacts due to change of site or access of land during construction/ operation/ study.
- b) Negotiations and related delays associated with land acquisition issues.

4.3 DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION IN AREA OF INFLUENCE

Due to the social and Jagirdari set-up in the project area, it was difficult to collect the relevant information on this socially sensitive part of the questionnaire; however, an effort was made to get the desired information relating to the demographic features of the population residing along the project corridor. The demographic features include the information on ethnicity/tribes, size of households, gender composition, and literacy status of the population in the project area.

4.3.1 Family Size

In the project corridor, the population is living in an extended, joint and nuclear family system. An extended family system refers to the households where parents and grandparents are living together in a household, while joint family system includes the households where, parents, brothers, sisters, sons, daughters are living together. The nuclear family includes only a single family, i.e. husband, wife & kids.

In the visit, it was observed that in the project corridor; mostly the population is living in a joint family system.

4.3.2 Gender Composition

The gender composition, on the whole, includes the proportion of male and female population in the ratio of 52 percent and 48 percent males and females respectively residing along the project corridor

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Table 4.1: Demographic Analysis of Sample Population

Area	Gender Composition		Literacy Rate (%)		
	Male (%)	Female (%)	Overall	Male	Female
Project Area	52	48	60	65	35

4.3.3 Education Status

Literacy is not just attaining the skills of reading and writing but providing people with the skills to learn, protect and empower themselves in society and effectively contribute in decision making at various levels. The general disparity in education exists in low-income communities.

4.3.4 Nature of Occupation

In the project area, the major occupations include business (shops, stores, kiosks, medical stores etc.), service (government, private, drivers), labour (skilled & unskilled), farming and others (i.e. abroad, artisans etc.). The socioeconomic baseline survey results summarized that on overall basis in the project area, 5 percent of population settled along the project corridor operated business (general stores, shops etc); 10 percent are labourers/tenants, 3 percent are engaged in farming, while 11 percent are in service sector.

Table 4.2: Major Occupations of Sample Population

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Area	Main Occupation (%)			
	Service	Business	Labour	Farming
Project Area	11	5	10	3

4.4 AGRICULTURE

4.4.1 Land Use Pattern along the Project Corridor

The optimum cropping pattern refers to the allocation of cultivated area under different crops during the year in order to attain maximum output within the existing resources. There are only three main crops being grown along the project corridor. In Rabi season, wheat is the main crop, in Kharif season the main crop is cotton, sugarcane and in few cases rice.

4.4.2 Cropping Intensity

The extent of cultivated area due to its less developed irrigation system is less due to terrain of most of the area being sandy desert. The average cropping intensity is estimated as below as compared to other Districts of Punjab.

4.4.3 Crop Yield

Crop yield is one of the key performance indicators to assess the productivity of land. As discussed above, there are the main species grown in the area like as wheat, rice, maize, cotton and fodder crops. The average yield of wheat crop is 1600kgs per acre, rice (paddy) is estimated as 1400kgs per acre and sugarcane is estimated as 2500kgs per acre along the project corridor.

Cotton crop yield is about 4000 Kgs per acre.

4.4.4 Household Expenditure

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

Table 4.3: Average Monthly Expenditure

Area	Food Expenditure (Rs)	Non-Food Expenditure (Rs)	Occasional Expenditure (Rs)	Total Expenditure per Month (Rs)
Project Area	3711	1594	1600	7482

4.4.5 Extent of Credit Utilization

Generally, the credit is obtained to supplement the income to meet routine and some occasional expenditure of the household including investment, social needs and other unforeseen situations. Credit is obtained from formal (banks/institutions) and informal sources (friends, relatives, land owners etc.). Mostly people do not like to get credits from the government saying that the mark up rate is very high.

4.4.6 Access to Social Amenities

Generally, in the project area, drinking water is available to the population. In the survey it was noted that along the project corridor, the major sources of drinking water were “hand pumps, wells/electric motor, tube wells, electric wells (motor) etc.

Table 4.4: Access to Social Amenities along the Project Corridor (Percentage)

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Social Amenities	Available	Satisfactory	Non Satisfactory	No Access
Electricity	100	20	77	1
Sui Gas	75	36	37	23
Water Supply	0	0	0	100
Telephone	65	12	24	64
Sewerage/Drainage	47	7	33	49
Health Unit	99	13	87	1
School	99	43	56	0

4.5 SOCIO ECONOMIC SURVEY

The categories of stakeholders which are not directly located inside the project area have also been interviewed. They include farmers, tenants, labourers, vendors, drivers, students, shop keepers and females etc.

4.6 CULTURAL AND RELIGIOUS STRUCTURES

No such site is located near project area.

4.7 INDIGENOUS AND WOMEN HEADED HOUSEHOLDS

During the field visit of the project, efforts were made to identify the indigenous and women headed households along the Project boundary. But no indigenous group of people was identified which comes under the definition of “Indigenous People”

CHAPTER 5

ENVIRONMENTAL BASELINE

5.1 INTRODUCTION

The district can be divided into three main parts. These are the riverain area, the canal irrigated area and the Cholistan area. The riverain area of the district lies close to the river Indus and Panjnad. To the South West of this area lies the canal irrigated area. The land in this area is higher than that of the riverain area. The approximate height of this area is 150 to 200 meters above sea level. The desert area lies in the South-East of the district. It is called as the Cholistan. It extends into Bahawalpur and Bahawalnagar districts, occupying the South-Eastern part of the two districts. The surface of the desert consist of a succession of sand dunes rising in places to a height of about 150 meters and covered with the vegetation peculiar to sandy tracts.

5.2 GENERAL BASELINE SURVEY

This section describes the baseline conditions, which cover the existing physical, ecological, and socio-economic environment of the Project Area. Information on these aspects has been derived from the desk study of available data, field visits to the Project Area as well as information obtained through visits to the Government departments and other agencies.

Information regarding physical environment is collected within project area as well as study area. While in case of biological and social environment, efforts were made to collect the information in 2 km around the project area and even upto 10 km in case any direct or indirect impacts were envisaged.

5.3 PHYSICAL FEATURES AND TOPOGRAPHY

The Indus River flows on the North-West side of district Rahim Yar Khan and forms its boundary with Rajanpur and Muzaffargarh districts. On its South-West lies the

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Province of Sindh. The Cholistan desert is located on the South-East side up to the Indian Territory and the Bahawalpur district. District Rahim Yar Khan is spread over an area of 11,880 square kilometres comprising of following four tehsils:

- i. Rahim Yar Khan
- ii. Khanpur
- iii. Liaqatabad
- iv. Sadiqabad

This district is divided into three main physical features i.e. (a) Riverine area. (b) Canal irrigated area and (c) Desert area which is called Cholistan. The Riverine area of the district lies close on the southern side of the Indus River mainly falling in the river bed. The canal irrigated area lies on the South and is separated by main Minchan Bund. The approximate height of the irrigated area is 150 to 200 meters above the sea level. The third part of the area called Cholistan lies in the south of the irrigated tract upto the Indo-Pak border. The surface of the desert consists of a succession of sand dunes rising at places to a height of 150 meters and covered with the vegetation peculiar to sandy tracts.

5.4 GEOLOGY

The land of Pakistan provides a fascinating exhibition of geological evolution. It is a bonanza of different lithospheric plates, which have been accreted together in such a way that has a rare parallel in the world with respect to its structure, relief, rock types and landscape. It has an assemblage of rocks, which probably has a complete succession of rocks ranging from the deep mantle of the earth to rock of the upper lithosphere.

Punjab Province mostly comprises of plain areas lying in Indus Basin formation. This District lies in this Indus basin formation which is alluvial deposit formed due to river action. Ground is almost flat and 40% of the area is Desert of Cholistan.

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5.5 LAND USE

Major portion of the Punjab Province falls in the Indus Plain, which geologically originated in Late Pleistocene period by deposition of sediments from the Himalayas into abyssal sea. In early days the sediments were carried by two river systems, viz., Indus and Ganges. Later in the geological history, the Ganges River changed its course from westward to eastward.

Later, the Indus River and its five major tributaries, viz., Jhelum, Chenab, Ravi, Bias and Sutlej, carved the deposits of the early river systems. These river systems are spread in the Punjab Plains like fingers of a hand, consequently dividing the whole province into four masses of lands called Doabas (meaning the lands between two rivers).

About 50 % of the project area is uncultivated while remaining 50 % is being cultivated by irrigation water as well as ground water through tubewells. The main crops being cultivated in the study area include wheat, sugar cane, cotton, rice, maize, etc.

5.6 WATER RESOURCES

5.6.1 Surface Water

The social and economic life of the country mainly revolves round this Indus Basin plain as it generates about 90% of the Punjab's total agricultural income

The Indus Plain does not have a well-defined natural drainage. The introduction of irrigation system therefore resulted in surface and sub surface drainage problems resulting in water logging and salinity, which has continued to aggravate over the period. This has adversely affected the socio-economic conditions of the large rural population by impairing agricultural production and also creating health hazards. Massive efforts have been undertaken since 1960 to overcome this problem by implementing a large number of surface and sub-surface drainage projects.

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In spite of these efforts, water logging has not been completely eradicated. Consequently, pockets of wetlands resulting from the water logging are encountered in plains of Punjab, Main Canal and its distributory runs across the project.

5.6.2 Ground Water Quality

The microbiological analysis results of ground water are not upto the mark. Groundwater is brackish and not fit for use. Only at few places the sub-soil water is sweet and fit for drinking purposes.

5.7 RAINFALL

Out of the eight climatic zones of Pakistan, Rahim Yar Khan District is located in hot arid climatic zone, associated with 100 mm rains. 100% of the site falls in this zone.

Broadly, there are four well marked seasons in Pakistan. These are:

1. Cold season (December to March)
2. Hot season (April to June)
3. Monsoon season (July to September)
4. Post-Monsoon season (October and November)

5.8 AMBIENT AIR QUALITY

Information on ambient air quality in rural areas particularly related with the traffic on the highways and the roads is totally missing. This is mainly because air pollution is primarily a hazard for urban areas where the increasing number of industries and vehicles is increasingly concentrating the pollutants in air and also prevents them from being dispersed. As far as rural areas are concerned the air quality has not been a problem, except near sources of noxious and large emissions, such as cement factories.

The ambient air quality was monitored in the Project Area. The ambient air quality was monitored for priority pollutants (Carbon monoxide, Nitrogen dioxide, Sulfur

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dioxide and particulate matter PM10). The monitoring period was 24 hours at individual sampling points. In absence of National Ambient Air Quality Standards, the data could be compared with some internationally recognized standard as reference.

5.9 BIOLOGICAL RESOURCES

5.9.1 General

Once rich in natural vegetation the land use pattern of the Indus Basin and other areas has greatly been modified for want of land for cultivation. This has changed the pattern of flora wherever irrigation was possible.

5.9.2 Flora

The flora of the district characteristics are two major ecological divisions, northern, southern. The botanical life found in the northern half identifies itself with that of the rest of the irrigated tracts at central Punjab. The human interference in the form of irrigation network has virtually wiped out the old plantation without much revolutionization of the phytophysiology in the area. Due to factors such as waterlogging and salinity, only the salt resistant plants can survive in most of the area. The southern half is characterized by sand dunes, more or less barren of vegetation except in the rainy season when multitudes of ephemeral or short lived plants come up and transform the bare land into a lush green carpet. In general, the vegetation in this part of the arid region is sparse. The bulk of the vegetation consists of stunted, thorny or prickly shrubs and perennial herbs capable of withstanding drought with grown in open clump formation with plenty of vacant spaces between them. Distinctly scattered trees of stunted growth are found along the depression technically known as desert scrub.

Plants found in Cholistan are as under:

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1. Phatokar: Cholistan aborigines use its puddings for (halva) the removal of worms from the alimentary tract.
2. Katran: A shrub with aromatic leaves (fragrance). Its bark is used for asthma and the Sharbat is given to patients suffering from prolonged fever.
3. Chapri: Cholistanis consider it as a Soghat. It is used in rheumatic pain and as diuretic. It is believed to increase sexual potency.
4. Baren Dandi: it is a medicinal plant, particularly useful in liver trouble.
5. Gor gopan: it is considered as a Thandi Booti. It is used in liver trouble. Some take it as substitute of tea.
6. Bo Phali: Cholistanis take it for the cure of urinary tract troubles.
7. Rat Sat: It is believed that this weed contains ingredients of certain minerals. Chemists are generally found interested in this plant, perhaps due to some minerals of medicinal significance.
8. Phali: Indian bustard's favorite food (seeds), also eaten by camels.
9. Olatee: Seeds eaten by desert partridges.
10. Phag: The flower is cooked as pot herb (sag) and tastes like eggs.
11. Khip: it is being tried as a substitute of jute: its seeds are considered to be a rich source of fat.
12. Pelu: The fat from Pelu seeds is being studied for its utilization in soap making.
13. Boara: Gum is extracted from this plant.
14. Pepoon: It is a fungus which grows on decaying roots of capparis and is eaten as a vegetable. Chatni is also prepared from it.
15. Agaricus: (Khumbi) This fungus is also cooked and taken as food.
16. Monyan: Serves as fodder for animals.

5.9.3 Fauna

An unblemished geographical feature of a vast arid land, popularly known as Cholistan desert provides an ideal opportunity for a variety of wildlife. A wild cat still exists in the area which as the desert traditions say, is very fond of ripping apart the newly born young goes of Chinkara deer. Pig known as Hirhoon, Jitama, Bhoondin or Soor in this area is found in a fairly large number in government plantation near the desert. Jackals (Geeder), fox (Loomeri), badger (Bijjoo) also exist in the desert. Wolfe locally known as Mahr is negligible now. Porcupile (Seh), squirrel (Golhari Fubhri) and jerbils musk rat (Chhachhoondar), wild rat (Choocha) of brownish color mongoose (Neola), are generally visible. Mongoose has half a dozen of varieties in this area. Though small, it readily attacks much larger animals. It kills large number of poisonous snakes and rodents. A duel between mongoose and cobra used to be a familiar attraction in village festivities generating enthusiasm of no less than a bull fighting.

Some of the animals such as hog deer (Parha), blue bull (neel Ghaee) and ravine deer (Heron) are more or less non-existent now and are rarely witnessed across the Indian borders. Black buck, once a beauty of the desert has been totally eliminated. Chinkara is a fine specimen of antelopes, though not as original as the black buck, commonly known as Ghazaal.

Black crow, sparrow and dove are numerically common as in other parts of Punjab, Green parrots are also found and generally damage the crops. Myna is however a useful bird for cultivators. Lark is another bird which charmingly charts in the early morning hours. Owl has also established its existence in the specific types such as Chibri and Ghug. Falcons here are of various species known as Baz, Shikra and Shaheen etc. Tanny eagle, spotted eagle, bonelli's eagle, lagger eagle, white and black vultures, mash harrier and kestrel are generally spotted in the area. Falcon used for hunting the bustard is especially trained for this purpose. It is caught hold of at tender

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age, through interesting indigenous methods which are other wise banned under the law protecting the wild life.

Wild lizards are witnessed here in a number of species including Goh, Kirli and Kirla. Another species is locally called gohira and yet another Sanda. A very deadly poisonous snake Padam is also found in the district as the local saying goes “Jen Ko dangia Padam, Chalan Noa Ditha Qadam”, (he whom Padam has bitten, will not go another step). White egrets, little egrets and black wing stilts are common and feed on insects and fish. Amphibians generally include on y frogs and toads.

Over 40 varieties of fishes are found in the district. Rahu, Thaila, Mori, Mullee, Khagga and Sanghara are however found in abundance in river, canals and ponds.

5.10 ADMINISTRATIVE SETUP

The total area of the district is 11,880 square kilometers. The district comprises four Tehsils namely Rahim Yar Khan, Sadiqabad, Liaquatpur and Khanpur. All the Tehsils are under Tehsil Municipal Administration (TMA).

Tehsil wise area in Acres is as under:

Name of Tehsil	Total Area (Acres)	Cultivated Area (Acres)	Uncultivated Area (Acres)
Rahimyarkhan	4,94,497	4,44,098	50,399
Sadiqabad	5,33,179	4,50,804	82,375
Khanpur	3,77,003	3,00,930	76,073
Liaquatpur	3,62,805	3,30,860	31,945
Total	17,67,484	15,26,692	2,40,792

5.11 TEHSIL WISE REVENUE SETUP

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Tehsil	Qanungois	Patwar Circles	Revenue Estates	Area in Square Acres
Sadiqabad	10	86	319	5,33,179
Rahimyarkhan	10	88	322	4,94,497
Khanpur	10	75	261	3,77,003
Liaquatpur	8	75	248	3,62,805
Total	38	324	1150	17,67,484

5.12 CLIMATE

5.12.1 Weather

The climate of the district is hot and dry in the summer and cold and dry in the winter. The summer season is comparatively lingered. Its starts in April and continues till October. The winter season goes from November to March. However, the months of March and November are pleasant. Dust Storms are frequent during summer season. The average rain fall is about 100 millimeters.

Following table **(Table 5.1)** shows minimum and maximum temperature, precipitation and relative humidity:

Table 5.1: Month wise Temperature, Precipitation and Relative Humidity, 1960-98

Month	Average Temperature		Precipitation (in millimetres)	Relative Humidity (%)
	Maximum	Minimum		
January	21.8	4.4	4.4	57.5
February	24.4	7.3	5.3	52.0
March	30.2	12.8	5.5	46.4
April	37.0	18.5	2.7	35.2

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May	41.7	23.6	5.1	33.4
June	42.4	27.2	2.8	41.7
July	30.9	27.3	27.5	53.4
August	38.4	26.3	23.0	57.7
September	37.0	23.1	15.5	56.9
October	4.8	16.3	1.2	50.0
November	20.4	10.1	0.7	53.7
December	23.5	5.3	3.3	59.5

Source: Data processing Centre, Pakistan Meteorological Department, Karachi, 1961-90

CHAPTER 6

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 SCREENING

Section 12 of Punjab Environmental Protection Act (PEPA), 1997 (Amended 2012) states: *“No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an Environmental Impact Assessment (EIA), and has obtained from the Government Agency approval in respect thereof.”*

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), the said project is the Installation of Wastewater Treatment Plant which falls under Category F; “Water supply schemes and treatment plants with total cost of Rs.50 million and above” of the projects mentioned in Schedule II.

6.2 SPATIAL AND TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

The said project is the installation of wastewater treatment plant within the existing facility of M/s Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and the selected land is under the ownership of company. By the implementation of said

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project, the wastewater generated from the various sections like; washing of sugarcane, crushing, washing of vessel, etc. will be treated before its final disposal. By implementation of said project the sanitary condition of selected area will be improved as the pollution load will be reduced significantly, water quality will be improved, pollutants & toxicants will be eliminated that enable the generated wastewater to be reused for various domestic & horticultural activities. The wastewater treatment may cause nuisance for general public as odor will be generated while treating the wastewater & during sludge drying, it will be mitigated by maintaining the treatment plant on regularly and through thick tree plantation. Moreover, the residential area is at the safe distance from project site.

The wastewater of sugar mills can be a source of nuisance, if not properly disposed off. It can cause serious health issues among the people using the water directly or indirectly after the discharge of the wastewater in the channel. Similarly, WWTP site can also have negative impacts if not properly managed. The spatial and temporal analyses associated with the site are discussed in this section. This WWTP site is carefully selected, as it is in the premises of the Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and is in vicinity of water body (channel). Therefore, after rigorous treatment through WWTP, the wastewater will be discharge directly into the channel that will be safer to ecosystem. It can be seen from the above map that there are fewer residential houses and more agricultural area within the 01 km radius, which makes it a suitable site for the WWTP.

Significant Impacts and Factors to be Determined

Main impacts and factors to be determined are

- Occupational Health and safety
- Site Security
- Traffic Management

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- Hygiene management
- Job opportunities for locals
- Resource conservation
- Avoid excessive water consumption
- Tree plantation at designated green areas
- Emergency preparedness

6.3 ENVIRONMENTAL PARAMETERS

This section identifies the potential impacts related to construction and operation of the proposed project on the physical, ecological and socioeconomic domains of the environment. Accordingly mitigation measures have also been reported to manage the environment and for sustainable development. The project activities will neither adversely affect the population nor the environment around the project site.

6.3.1 ENVIRONMENTAL PARAMETERS ASSOCIATED WITH PROJECT LOCATION

The proposed project is the installation of effluent treatment plant having current capacity m³ /hour at Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. There is no human settlement, heritage building, social structure, grassland or preserved area in the project vicinity that could be damaged, dislocated or dismantled due to the project activity in the proposed area.

The proposed project site is undisputed open land located within existing facility of M/S Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. So, no other site alternative has been considered in this regard. Wastewater generated from the operation of sugar mill will be treated in proposed treatment plant.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigation Measures

No mitigation measure will be adopted as the selected site is in close proximity of existing unit and is already under the ownership of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.

6.3.2 Design

The said treatment plant is designed to treat wastewater at the rate of 150 m³ /hour. However, in pre-construction phase a management system should be provided so anticipated impacts can be reduced. Design of the proposed plant will adhere to all standard technical requirements in order to avoid adverse impacts on socioenvironmental aspect.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigation Measures

No mitigation measure will be required as state of the art technology is being adopted for the installation of WWTP.

6.3.3 Impacts and Mitigation Measures during Construction Phase

The main contractor for the construction of aforementioned project will be expert in similar construction developments. It is expected that a maximum of 15-20 workers will be hired and it is planned that they will use existing building for domestic activities. The construction activities will include

- Site leveling
- Utilities and services connections to site
- Foundation excavations and installation of concrete footings
- Erection of waste water treatment plant
- Installation of machinery
- Commissioning

Impacts of Dust and Exhaust Emissions

Air quality is expected to deteriorate locally mainly due to fugitive dust emission and exhaust gaseous emission from vehicular movement. This will cause short-term but moderate impacts on local environment. Soil erosion may occur in small area and they will be prone to wind erosion. Air pollutants such as; NO_x, SO_x and CO emissions may be generated from the working of the construction machinery on-site which includes; hauling vehicles, loaders, trucks, mixers, etc. This machinery will generate, smoke and other potential pollutants in the air. This impact is considered to be negative of minor magnitude. The effect due to construction is however, of temporary nature and will have no permanent impact on environment.

Nature of Impact

The nature of the proposed impact will be direct, medium, short-term and hence significant.

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Mitigation Measures

Dust control measures are need to be taken to control the same; as the area is located in semi-arid zone and it is vulnerable to spread during high winds. Following mitigation measures will be adopted to mitigate the anticipated impact:

- Ensure that the trucks carrying the raw-material should be covered with covered sheets to reduce fugitive dust emissions.
- Water sprinkling should be done on the regular basis.
- Ensure that all equipment and vehicles, used during the construction phase, are properly tuned and maintained in good working condition, in order to minimize the exhaust emissions.
- Ensure that high quality fuel having low sulfur contents will be used in the vehicles engaged in the construction activity.
- Ensure that dust emission generated due to vehicular movement is minimized by restricted speed limit and vehicular movement impacts which will be minimized through good traffic management.
- Ensure that dust emission during the construction phase will be minimized by implementing best management practices

Soil Erosion and Contamination

On-site disposal of solid waste and leakage from construction machinery / vehicles can cause soil contamination. Improper disposal of domestic wastewater may contaminate the soil which would result in groundwater contamination.

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Nature of Impact

The nature of the impact will be short-term and insignificant.

Mitigation Measures

The following practices will be adopted to minimize the risk of soil contamination:

- Removal of the tree will be avoided up to the extent possible. In case of unavoidable circumstances, the exposed soil will be re-vegetated quickly and compensatory plantation will be carried out as soon as possible.
- Maintenance and washing of vehicles and equipment should be carried out at designated areas.
- Regular inspections should be carried out to detect leakages in construction vehicles and equipment.
- It is mandatory to instruct and train workforce in the storage and handling of materials that can potentially cause soil contamination.
- Proper segregation of solid waste should be done. Solid waste generated during construction will be properly and safely disposed of as per practices of area.

Noise Pollution

The use of heavy equipment during site clearance and construction works will inevitably generate noise, which may create a nuisance in the vicinity. The aforesaid impact is considered to be negative as it will not last for an extended time period and thus this aspect can be considered to have a very low significance.

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Nature of Impact

Nature of impact will be low, short-term, temporary and significant

Mitigation

Following mitigation measures should be adopted:

- Warning signs should be posted within the vicinity of the impact and all personnel shall be provided with personal protective equipment. For example, workers operating equipment that generates noise should be equipped with the appropriate noise protection PPE.
- Construction activities that will generate disturbing sounds should be restricted to day time.
- Proper tuning of the vehicles should be done on the regular basis, so that the noise level will be reduced up to the acceptable limits.
- Noise related activities should be done speedily and completed as soon as practically possible.
- Construction activity should be confined to the small reserved area.

Impacts on Ground Water Quality

The construction activities will be associated with mechanical fabrication, assembly and erection of the wastewater treatment plant. If it is deemed necessary for the proposed treatment plant to have deep foundations due to poor soil strata qualities, deep excavations might be required. The main negative impact associated with deep excavations will be the pollution of ground water.

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Nature of Impact

The nature of the impact will be high, short-term, temporary and significant.

Mitigation

Following mitigation measures will be adopted:

- Adopt proper excavation measures.
- Monitoring should be carried out throughout the construction activity to check the ground water quality.

Occupational Safety

During the construction phase, heavy machinery will be deployed on-site. Heavy machines make a lot of noise, may generate carbon dioxide emissions, generate dust and may cause accidents among operators, if not handled properly. This is likely to have negative impact on health of the workers. To limit the risk of accidents, safety procedures will be put in place and enforced by the foreman to ensure that vehicles and machinery only drive in designated places by authorized technician.

Nature of Impact

The nature of the impact will be high, short-term, temporary and in-significant.

Mitigation

To reduce the hazard, the following mitigation measures will be implemented:

- ♣ Make sure all the workers wear Personal Protective Equipment (PPEs) while working. The PPEs will include; helmets, safety shoes, mask, ear-plugs/ear muffs, etc.

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- ♣ Wearing of the PPEs should be enforced strictly by the contractor.
- ♣ Regular checking and maintenance of the machines should be done in order to maintain working machinery and to avoid accidents.
- ♣ Noise related activities should be done during the day hours and make sure the workers wear the ear-plugs/muffs.
- ♣ Generated dust can be controlled effectively by water sprinkling
- ♣ No machinery will be left unattended, particularly in the running condition.
- ♣ Nighttime driving of project vehicles will be limited.
- ♣ The Contractor will ensure that construction labor is trained in safety procedures for all relevant aspects of construction.
- ♣ Management will make regular checks that the contractor is following safe practices. Safety of the public at all stages of the construction will be ensured by provision of safety measures such as use of sign boards, barriers and flags.

Socioeconomic Impacts

In project area, no significant changes are envisaged in the traditional life style and occupation of the local people in residing in the nearby communities. The local people are rather benefited due to the provision of job opportunities. No impact is envisaged due to the influx of the workers as the local will be preferred and hired for working.

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Nature of impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigation

Following mitigation measures will be adopted to reduce the socio-economic impact on the community:

- Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and un-skilled employment to the locals as well as on-job training.
- Contractor will restrict his permanent staff to mix with the locals to avoid any social problems.
- The contractor should prefer hiring local labor.
- At the time of hiring the Contractor has to ensure that the workers should be of good repute.
- First aid kits having all the necessary first aid stuff will be available at the site.

6.3.4 Impacts and Mitigation Measures during Operational Phase

The following section describes the potential impacts which are associated with the proposed treatment plant during the operational phase.

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Noise

Noise pollution is not expected to occur at all during the operational phase. The mechanical and electrical components of the proposed technology work within the permissible noise limit levels. Moreover, even if the noise level exceeds the allowable levels during unexpected conditions, this will have no significant impact since the nearby residential areas are found at the safe distance from the treatment plant.

Nature of impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigations

In general the following methods will be adopted to control the noise pollution from the proposed unit:

- Personal protective equipments like ear plugs and ear muffs should be provided to employees working in the noise prone areas.
- Time to time oiling and servicing of machineries should be done.
- A thick greenbelt will be developed all around the plant which will be act as noise barrier.

Ambient Air Quality

No air pollution problems are expected to be associated with the operation of the said wastewater treatment plant.

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Nature of impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigations

No mitigation measure will be required as the project is designed to keep the ambient air quality of the area intact because aerobic process is employed.

Odor

The treatment technology adopted has been designed to prevent the production of any foul gases (i.e. hydrogen sulfide) due to the chemical and biological reactions taking place. Thus, there will be no significant generation of odor. Odor problems will mainly arise from the sludge hauling process, blocking of pipes, malfunctioning of the pumping stations and leakage of pipes.

Nature of impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

Mitigations

In general the following methods will be adopted to control the odor from the proposed units:

- An appropriate action plan should be devised to deal with blockages or leaks as quickly as possible.

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- It must be ensured that appropriate spares, in terms of fittings and other mechanical components are available at all times.
- Regular maintenance should be carried out.
- Tankers should be well equipped with efficient extraction capacity such that the sludge hauling process should be done as quickly as possible.
- Dewatering of sludge should be done
- The sludge hauling process should not be carried out during peak hours, week days and on windy days.
- Different types of trees should be planted in the vicinity of the treatment plant.

Sludge Disposal

The sludge produced by the wastewater treatment plant will be air dried on-site in sludge drying beds before being moved to a sludge stockpile area using tractor trolley. The foul smell generated from drying bed may cause nuisances for general public. Sludge generated by the sewage treatment processes may have beneficial effects for the crop plantations around the site. Hence, no significant adverse impacts are expected.

Nature of impact

The nature of the proposed impact will be direct, low, short-term and hence insignificant.

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Mitigations Measures

Following mitigation measures will be adopted:

- Proper sludge disposal measures such as from existing established methods and standards should be adopted.
- Aerobic decomposition will be carried out which will prevent production of H₂S gas.
- To control foul smell, thin layering (2-3 cm) for sludge will be dried this will promote aerobic condition.
- During drying sludge aeration can be done regularly to control foul smell.
- Trees should be planted along the project area boundary to mitigate odor.

Mosquitoes and other Nuisances

Flies and mosquitoes can breed in the tanks and sludge lagoons during the operation of plant.

Nature of impact

The nature of the proposed impact will be direct, medium, long-term and hence significant.

Mitigations Required

Following mitigation measures will be adopted:

- All water accumulation within the treatment units should be fully drained as quickly as possible to put an end to the production of the vector itself.

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- Under drains and other water pipes should be regularly inspected and cleaned.
- Maintenance activities should be regularly conducted.
- The sludge must be covered with thin-pored veils. The latter will allow the transmission of sunlight and at the same time prevent the entry of mosquitoes.
- Fumigation should regularly be carried out within the vicinity of the treatment plant.

Possible Emergencies and Plant Failure

Operational difficulties may be experienced at plant start-up or during periods when equipment malfunctions. For this purpose, vendor will train the team.

Nature of impact

The nature of the proposed impact will be direct, medium, long-term and hence significant.

Mitigations

- Equipment should be kept in good operating conditions to prevent equipment failure.
- Training programme for plant operation and maintenance activities should be included as part of the project's technical assistance programme

Emergency Response

Emergency response preparedness committee by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan will be formulated consisted of heads of all the departments. Project Manager will be the head of the team who will chair incident control. In the case of emergency, the first aid box will be provided. Incidents and

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accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include; accident and natural disasters.

Nature of impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigation

- Workers should be given adequate training of handling machinery.
- Emergency call service must be made available.
- The drills to check the response of the workers against any emergency situation will be carried out Safety and hazards signs will be displayed with the facility to avoid any unfortunate incident.
- Only authorized technicians will be allowed for the handling of the chemicals

6.4 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

i. Enhancement in opportunities for employment

During proposed construction, the employment opportunity will be enhanced. Workers will be hired from local community, include; skilled and un-skilled workers. During construction phase 20 - 25 workers will be hired and in operational phase only 10 workers will be employed as the process employed will be fully automated. It will include technical staff only. Locals will also have the opportunity to diversify their income by being employed during various project phases. Hence, there will be an increased employment

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opportunity for the local people which will have a positive impact on the socio-economic status of the area.

ii. Water Quality Enhancement

With the avenue of this wastewater treatment plant, the effluent will be safe prior to being released in the water bodies, hence contributing to the protection of the environment.

iii. Environment Friendly

Project Wastewater Treatment Plant will have positive environmental impacts and is expected to significantly reduce a source of chronic water pollution.

iv. Recycling/Reuse of Treated Wastewater

Wastewater treatment plant will contribute in saving water resources as effluent water from the treatment plant will be used for various purposes i.e. agricultural use, fire services use, washing of vehicles and many others.

v. Tree Plantation

At the end of the installation phase, landscape of the area will be enhanced by planting native and ornamental plants at the designated green areas. This will enhance the aesthetic look of the area.

**6.5 ENVIRONMENTAL AND SAFETY COMPONENTS AND THEIR
IMPACT MATRIX**

6.5.1 Environmental Matrix for Pre-Project Activity

S.N.	Activity	Positive Impact		Negative Impact		No Impact
		Short Term	Long Term	Short Term	Long Term	
Pre-Project Activity						
1	Displacement and Resettlement of local					√

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	people					
2	Change in Land Use					√
3	Loss of Trees/Vegetation				√	
4	Shifting of equipment, machinery and material					√
5	Employment for local people		√			

6.5.2 Environmental Matrix for Construction Phase

S.N.	Activity	Positive Impact		Negative Impact		No Impact
		Short Term	Long Term	Short Term	Long Term	
Construction Phase						
1	Pressure on infrastructure and transportation system			√		
2	Impact on air quality including dust generation			√		
3	Noise Pollution			√		
4	Traffic					√
5	Impact on the land/soil Environment			√		
6	Impact on groundwater					√
7	Stacking and disposal of construction material			√		
8	Impact on water quality			√		
9	Health and Safety conditions of people			√		
10	Social Impact		√			

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11	Economic Impact		√			
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6.5.3 Environmental Matrix for Operational Phase

S.N.	Activity	Positive Impact		Negative Impact		No Impact
		Short Term	Long Term	Short Term	Long Term	
Operational Phase						
1	Increase in air pollution and noise levels				√	
2	Water Usage		√			
3	Disposal of solid waste		√			
4	Infrastructure development		√			
5	Quality of life		√			
6	Handling operations for transfer, charging of raw materials, final product				√	

CHAPTER–7

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAMME

7.1 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) is the integral part of environmental assessment report. The primary objectives of the EMP are to:

- Define the responsibilities of project proponent, contractors and other role players, and effectively communicate environmental issues among them;
- Facilitate the implementation of the mitigation measures identified in the EIA by providing the technical details of each project impact, and providing an implementation schedule;
- Define a monitoring mechanism and identify monitoring parameters to ensure that all mitigation measures are completely and effectively implemented;
- All environmental safeguards are carried out correctly.
- The project is monitored for environmental impacts. Therefore, adverse impacts on environment are minimized.
- All relevant legislation is complied with.

7.2 STRUCTURE OF EMP

The structure of EMP should:

- Identify the resources required to implement the Environmental Management Plan (EMP) and outline relevant expenses arrangements.
- Identify key monitoring parameters and schedule of monitoring of these parameters identify training requirements at various stages of the development of the project.

- Environmental control methods to be used to minimize environmental impacts.
- Assign responsibility for each control measures to specific staff member.

7.3 INSTITUTIONAL CAPACITY

The following organizations would be involved in the implementation of the suggested EMP;

- Proponent of the project
- Project Contractor, as the executor of the EMP during construction stage of the proposed project Environmental Manager / Supervisor to monitor and execute the EMP during construction and operation stage.
- EPA Punjab, as Government Department to review and monitor the implementation of remedial and mitigation measures as given in EIA Report.

7.3.1 Specific Implementation Responsibilities

The implementation of the EMP will be the prime responsibility of the project proponent. He will designate responsibilities and obligations to its selected contractors and Environmental Manager / Supervisor. Specific responsibilities of key role players are illustrated hereunder:

7.3.2 Proponent

Proponent will be responsible for ensuring overall implementation of the EMP during construction as well as operational stages of the project. He will provide the requisite financial resources to the contractor and Environmental Manager / Supervisor to implement the EMP. Key responsibilities of proponent are:

- Communicate with local community and Regulatory Authorities in order to get time to time feedback of the stakeholders on various social and environmental concerns.
- Coordinate with regulatory agencies EPA or other departments.

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- Make sure liaison between the contractor / Environmental Manager / Supervisor and Environmental Consultant to check environmental compliance with EPA.

The contractor will be responsible for the implementation of all measures necessary to ensure that environmental impacts during construction phase should be minimized. In order to fulfill these requirements, contractor will carry out the following:

- Implement environmental good practice measures outlined in the mitigation measures.
- Provide, to extent practicable, environmental training to the work force and promote environmental awareness.
- Coordinate with local authorities as appropriate.
- Facilitate consultants during environmental monitoring.

7.3.3 Environmental Manager / Supervisor

The principle responsibilities included:

- To monitor on daily basis whether operational activities are carried out in an environmentally sound and sustainable manner.
- Coordination with provincial and local officials, community groups, government departments, etc. on environmental issues.
- Monitoring of the environmental aspects to ensure that the environmental impacts and the mitigation measures suggested in the EMP are implemented.
- Undertake critically important routine and visual monitoring of waste disposal and overall environmental management practices adopted.

7.3.4 Environment Protection Agency

The Role of EPA is on the apex and includes checking:

- The implementation of mitigation recommendations as given in EIA Approval for starting actual project operations is obtained from EPA and Orderly review of audit reports prepared internally or by a third party monitor.

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- Whether requirements of the Environment Approval awarded by the EPA against EIA report are met.
- Carry out environmental monitoring on quarterly basis and advise any changes in the structure or implementation method of the EMP.
- Suggest or order any appropriate solutions.

7.3.5 Auditing

The Audit will be carried out internally by the Proponent, Contractor and Environmental Manager / Supervisor. The primary aim of the auditing is to assess compliance and effectiveness of the EMP as well as the alternative environmental and social objectives and also to assess the effectiveness of corrective actions. Audit will also suggest remedial measures to overcome the environmental and social problems.

The external auditing will be carried out by the EPA, Punjab, in order to check compliance and implementation of EMP. The EPA will check various parameters with reference to various sections of Pakistan Environmental Protection Act PEPA- 1997 (amended 2012) and standards specified by PEQS there under.

7.4 TRAINING SCHEDULES

TRAINING SCHEDULE OF CONSTRUCTION PHASE				
Activity	Duration	Trainer	Venue	Addressee / Participants
Work at height	1 Day	Environmental Specialist of Contractor	Onsite	20 Workers of Construction phase.
Emergency drills	1 Day	Environmental Specialist of Contractor	Onsite	20 Workers of Construction phase.

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Health and Safety	1 Day	Environmental Specialist of Contractor	Onsite	20 Workers of Construction phase.
Water Sprinkling	1 Day	Environmental Specialist of Contractor	Onsite	20 Workers of Construction phase.
Briefing about EMP of construction phase	1 Day	Environmental Specialist of Contractor	Onsite	20 Workers of Construction phase.

7.5 EQUIPMENT MAINTENANCE DETAILS

Type of Equipment	Type of Inspection	Schedule
Maintenance of Vehicles (Cranes, Truck, Hydraulic, etc.)	Complete inspection and certification	Before put to work and annually
	Critical items, overall functioning	Daily
	Safety device, hooks, cables, electrical	Monthly
	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation
Heavy Equipment/ Machinery	Complete inspection	Before put to work
Maintenance of PPEs	Repair	When failure occurs
	Preventative maintenance	Manufacturer's Recommendation

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Maintenance of Fire Fighting Equipment's	Complete inspection	Weekly Basis
Miscellaneous	Complete inspection	Before put to work
Maintenance of Trees Plantation and Grassy Area	Complete inspection	Daily Basis

7.6 ENVIRONMENTAL BUDGET

Sr. No.	Activity	Budge (PRs)
1	Personal Protective Equipment's	1,00,000
2	Water Sprinkling	90,000
3	Tree Plantation and Grassy area	2,00,000
4	Fencing	80,000
5	Fire Fighting	1,50,000
6	Housekeeping	80,000
7	Training of Workers	1,00,000
8	Vehicle Maintenance	1,00,000
9	Maintenance of Equipment/ Machinery	2,00,000
	Total	11,00,000 (Eleven Lac Pak Rupees)

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7.6.1 Mitigation and Impact Assessment

What is the problem	When will problem occur and when it should be addressed	Where problem should be addressed	How the problem should be addressed
Dust Pollution	During construction phase, it should be addressed to reduce dust pollution	During construction activities	Water Sprinkling
Impacts on air quality	During construction phase, mitigation measures should be implemented	Construction vehicles during construction activities	Given in detail below
Impacts of solid waste generation	During construction phase, it should be addressed to reduce the solid waste generated from construction material.	During construction activities	Given in detail below

Proposed EMP reporting and reviewing procedures

- During construction, EMP reporting and reviewing will be done by the contractor/HSE department. Regular monitoring will be done and reports will be submitted in EPA as per condition of Environmental Approval of construction phase.

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- Monitoring reports will be reviewed by EMP team and HSE department of M/s Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and then will be shared with EPA.
- Photographic records will also be maintained
- Recorded data will be reviewed by supervisory contractor/proponent so that it can be further improved if required.

Mitigation and Impact Assessment

Purpose of Mitigation Measures should include:

- What is the problem i.e. in terms of “major environmental impacts” which may arise by the subject project activity?
- When the problem will occur and when it should be addressed.
- Where the problem should be addressed.
- And how the problem should be addressed.

The major impacts may arise by the proposed project are, dust, noise, solid waste, and wastewater. Other impacts are of minor importance. These impacts can arise during operation but precautionary measures have been adopted prior to start the operational activity, during the activity and post activity.

Any impact that would arise due to the subject project activity will be addressed through proper channel and on site. Trainings will be conducted regarding HSE, firefighting, best work practices etc. while other precautionary measures are also adopted to make the project safe and environmental friendly.

Whys of achieving Mitigation Measures by adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The detail of impacts and mitigation measures has been discussed in previous chapters.

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And how the problem should be addressed

The major impacts may arise by the project are dust, noise, solid waste, and waste water. Other impacts are of minor importance. These impacts can arise during operation but precautionary measures have been adopted prior to start of operational activity, during the activity and post activity. Any impact that would arise due to the proposed project activity will be addressed through proper channel. Trainings will be conducted regarding HSE, firefighting, best work practices etc. while other precautionary measures are also adopted to make the project safe and environmental friendly.

Project proponent will be responsible for the implementation of EMP and he has appointed as Project Manager/ Environmental Manager along with site manager to assess any impact that could be arisen during operation of the project. He is responsible to address the problem and to mitigate it.

Ways of Achieving Mitigation Measures

Adopting proper mitigation measures any anticipated major or minor environmental impact could be controlled or mitigated. The detail of impacts and mitigation measures has been discussed in previous chapters. Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan has been taking appropriate measures to provide pollution free and safe environment during the proposed project by implementing improved management. Practices and monitoring techniques suggested in EMP. Management will further take necessary actions to mitigate any residual impacts. The management will adopt such plan that will assure the minimum impact on the environment and health by implementing proper mitigation measures. Design of the building assures the structure stability in a long run. There was no dispute arose at the time of purchase of land and it is the property of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and if in future, there would arise any issue regarding environment degradation, they will compensate in terms of money as assured to achieve PEQS and compliance to other regulations made under PEPA 1997 (Amended 2012).

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Plantation will be done within the project site and for this area is reserved. The management will further develop Restoration / Reclamation or Tree Plantation Plan to restore the proposed project area. Plantation will be enhanced with native species within site, along the boundary wall and along the road side as per direction by EPA Punjab.

Improved Monitoring and Management Practices

The aim of improving monitoring is to enhance the environmental performance of the project through its enforcing the Punjab Environmental Quality Standards (PEQs) at all stages of activities as well as dealing with an emergency as and when it may occur. The objective of exercising by the management of the sugar mill is to ensure prevention of occurrence of any situation of emergency and in case of development of such situation, steps required to be taken to manage the situation. The section also contains a set of environmental guidelines for avoiding and preventing the adverse environmental impacts of the project. The monitoring will be carried out in accordance with Punjab Environmental Quality Standards (PEQs). The management will undertake monitoring of the Safety, Health and Environmental aspect, it will be the best tool for achieving mitigation measures.

Compensation in Money Terms

There is no affecting of the proposed project because the land of project is owned by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan. The construction and operational activities at the proposed project site will not damage inflict to any of the private properties, of the neighboring communities. Hence, no need of any sort of compensation. Not applicable in case of current project.

Replacement, Relocation and Rehabilitation

The management carrying all responsibility for cleaning and restoration will be carried out immediately after each phase of construction and will be the responsibility of each team in their respective area of operation, if relocation of any public utility or facility

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will involve, it should be carried out well ahead the start of construction to avoid disruption of service to the user-community. Once the phase will be over, efforts for restoring normalcy and rehabilitation should be initiated under instructions of the appropriate authorities or the project management committee, if any existing. Cleaning and restoration will be carried out during and immediately after each phase of construction and will be the responsibility of each team in their respective area of operation.

The following measures will be taken in this regard.

- All pin flags, stakes, signs and refuse will be removed.
- All concrete slabs will be broken and shipped to an appropriate site outside the Project.
- Area for proper disposal.
- Site will be cleaned so that no refuse or wastes are left behind; the waste will be properly disposed off.
- All ditches and sumps will be backfilled.
- Contaminated soil will be removed and be properly disposed off.

7.7 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Summary of impacts and their mitigation measures are presented below in Environmental Management Plan (EMP) of construction and operation phase.

IMPACTS	MITIGATION MEASURES
Noise from construction machinery and vehicles	Use of Personal protective Equipment's (PPEs)
Noise generated by machinery during processing within WWTP or during	Regular maintenance and vehicular monitoring.

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IMPACTS	MITIGATION MEASURES
construction phase from transport vehicles.	De-dusting System with Bag House
Wastewater generated during construction and operation phase.	Wastewater from domestic sources will be treated in septic tank prior to its use and drained out during construction. During operation, wastewater from proposed treatment plant will be treated and then reused for other purposes. Monitoring.
Gaseous emissions / particulate matter during construction and operation phase by processing of WWTP machinery or vehicles for transportation.	Covering of construction material to avoid dust. Installation of canopy or other equipments in case of any emission. Use of Personal Protective Equipment's (PPEs) while working. Maintenance and inspection of vehicles and processing machinery.
Construction, domestic or project related solid waste	Utilize the construction waste for road filling and maintenance. Solid waste bins will be placed at all suitable places. Moreover, disposal facility and proper management system should be provided.

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IMPACTS	MITIGATION MEASURES
Land or Soil Erosion	Removal of less vegetation. Restoration of land by plantation and maximum plantation will be done.
Health and Safety Issues	Use of PPEs. Training regarding Health & Safety, firefighting, and medical first aid. Never left machinery unattended. Well management practices will be adopted
Socioeconomic	Provide employment opportunities. Prefer local people for jobs.

Proposed EMP reporting and reviewing procedures

- During construction, EMP reporting and reviewing will be done by the contractor/HSE department. Regular monitoring will be done and reports will be submitted in EPA as per condition of Environmental Approval of construction phase.
- Monitoring reports will be reviewed by EMP team and HSE department of M/s Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and then will be shared with EPA.
- Photographic records will also be maintained
- Recorded data will be reviewed by supervisory contractor/proponent so that it can be further improved if required.

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7.8 ENVIRONMENTAL MANAGEMENT PLAN

Project activities	Type of impact	Potential impacts on environment	Extent /Magnitude	Mitigation measures	Institutional Responsibility	
					Implementing Body	Supervises
Pre construction phase						
Land acquirement and land use	Physical , Social and Aesthetical	Positive use of land but proper planning will be required	More / adjacent area	• Site is located within existing facility of M/s Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan and under their possession • Land will be improved from open land to wastewater treatment plant	Contractor	HSM

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Use of local manpower	social	Employee generation	Less / adjacent area	Local people will be hired for less technical work or non-skilled work	Contractor	HSM
Construction phase						
Civil works	Physical, Social, Biological Aesthetical	Dust, Noise & Vibration , Employment, Health & Safety of Workers	More / adjacent area	• Water sprinkling will be done to reduce dust emissions. • Noise control measures will be implemented • Use of water only from designated wells	Contractor	
Movement and fueling	Physical,	Noise	Moderate / at	Periodic maintenance	Contractor	

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of vehicles	Aesthetical	and dust	site	and inspection of vehicles • Vehicles with leaks will not be operated. • All vehicles carrying raw material and equipment's of WWTP will be maintained in good working condition		
Transportation of construction materials	Physical, Biological	Dust and Particulate, Noise Generation, Safety and Health Effects	Moderate / adjacent area	• Excessive use of horns will be avoided • PPE's will be provided to workers • Covering of transporting material trucks • Nighttime	Contractor	HSM

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				driving of project vehicles will be limited where possible Noise will be monitored through Digital Sound Meter		
Operational phase of WWTP						
Processing of waste water	Bio Physical Aesthetical	Odor, site safety, noise and health impact	Moderate / local	Proper operation of 3 months and training to WWTP operation team will be ensured by vendor. Complete manual of operation with complete details to run WWTP will be provided by	HSE Manager	HSM

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				vendor to the ETP operation team. • Proper treatment of wastewater must be ensure before final disposal • Regular monitoring must be conducted to check compliance of PEQS • Environmental Manager must be designated to monitor the efficiency and working of treatment plant • Health and safety of		
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				workers must be considered while testing. • PPE's must be provided to workers and proper signs must be displayed in local language for guidance of workers and visitors • Assembly point must be made and training of workers must be done on regular interval • Technical person must be available at site in case of any mechanical		
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				fault		
	biological	Odor, health and safety	Moderate / local	Sludge drying beds will ensure digestion of biosolids to minimize the moisture content and volume. • Sludge cakes will be sold used in agricultural fields and the excessive will be dispose off properly by contractor. • Tree plantation will be done along boundary and at designated green areas	Contractor	HSM

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7.9 ENVIRONMENTAL MONITORING PROGRAM

Sr. No.	Potential Impact	Action to be Followed	Parameters for Monitoring	Frequency of Monitoring
1	Air Emissions	All equipment's will be operated within specified design parameters.	Random checks of equipment logs/ manuals	Periodic
		Vehicle trips should be optimized to the possible extent.	Vehicle logs	Periodic during site clearance & construction Activities
		Maintenance of Induction Furnace emissions to meet stipulated standards	particulates and Gaseous emissions	Periodic emission monitoring
		Ambient air quality within the premises of the proposed unit should be monitored.	The ambient air quality shall conform to the standards for PM10, PM2.5, SO ₂ , NO _x , and CO	As per EPA requirement or on monthly basis whichever is earlier

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2	Noise	List of all noise generating machinery onsite will be prepared. Equipment will be maintained in good working order.	Equipment logs, noise reading	Regular during construction activities
		Working at night time will be minimized.	Working hour records	Daily records
		Generation of vehicular noise.	Maintenance of records of vehicles	Daily records
		Noise will be monitored in ambient air within WWTP premises.	Spot noise recording	As per EPA requirement or on quarterly basis
3	Wastewater Discharge	No discharge will be made to surface water, groundwater or soil.	No discharge hoses shall be in vicinity of water courses.	Periodic during construction activities
4	Soil Erosion	Protect topsoil stockpile possibly at edge of site.	Effective cover in place.	Periodic during construction activities
		Ensure drainage system and specific	Visual inspection of	Periodic during

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5	Drainage and Wastewater Management	design measures will be working effectively. The design will incorporate existing drainage pattern and avoid disturbance.	drainage and records thereof	construction activities
6	Waste Management	Implement waste management plan that identifies and characterizes waste associated with project and which identifies the procedures for collection, handling & disposal of each waste arising.	Comprehensive Waste Management Plan should be in place and available for inspection on-site.	Periodic check during construction activities
7	Health of Workers	Employees and migrant labour health check ups	All relevant parameters	Regular check ups
8	Loss of flora and Fauna	Re-vegetation as per guidelines	No. of plants, species	During site Clearance

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7.9.1 Costed Environmental Monitoring Program

Environ mental Indicato r	Project Stage	Parameter	Special Guidance	Stan dard	MONITORING			Institutio nal Responsi bility
					Locati on	Frequenc y	Durat ion	
Water Quality	Operati on stage	pH, BOD, COD, TDS, TSS, DO, Oil & Grease, Pb, Chlorides, zinc, cadmium, total coliforms, and faecal coliforms	Grab sample collected from source and analyze as per Standard Methods for Examinatio n of Water and Wastewater	PEQs	Project site	End of summer before the onset of monsoon every year.	—	Proponent
Noise	Operati on Stage	Noise levels on dB(A) scale	Equivalent noise levels using an integrated noise level meter	PEQs	Project site	Quarterly	—	Proponent

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Environ mental Indicato r	Project Stage	Parameter	Special Guidance	Stan dard	MONITORING			Institutio nal Responsi bility
					Locati on	Frequenc y	Durat ion	
Air Quality	Operati on Stage	PM ₁₀ SO ₂ NO ₂ , CO, HO	Monitoring at pollution source	PEQs	Project site	Quarterly	Conti nuous 24 hours	Proponent

Total Cost for One (1) time Monitoring of each component will be

Approximately 1,00,000PKR

Thus Total Cost anticipated as 1 Million Pak Rupees

7.10 ENVIRONMENTAL TECHNICAL ASSISTANCE AND TRAINING PLAN

In order to raise the level of professional and managerial staff, there is need to upgrade their knowledge in the related areas. HSE/Project Manager should play a key-Roll in this respect and arrange the training program. Project Manager will provide training to staff and workers about the best EPA management practices at the project site and effective implementation of EMP.

CHAPTER 8

CONSIDERATION OF THE PROJECT ALTERNATIVES

8.1 SIGNIFICANCE OF THE ALTERNATIVES

The consideration of alternatives to a proposed project is one of the key aspects of an Environmental Impact Assessment (EIA). Consideration of alternatives assists the decision makers in the choice of an alternative, which has the least adverse and greatest beneficial environmental, social and economic consequences.

The most pertinent question to assess feasibility and propriety of a developmental project, from environmental impacts perspective, is to ask whether an alternative option would be better than the project proposal. The comparative analysis of the environmental and economic impacts of all the possible alternative question has been objectively and analytically examined in this EIA in the light of the impacts on the physical, biological, ecological, health, and economic environment as well as views and reservations of the stakeholders (proponent and the likely beneficiaries / losers).

8.2 NO PROJECT POSSIBLE ALTERNATIVES TO THE PROJECT REASONS

In the light of the views of the stakeholders and other objective evidence:

- The site Abandonment of the project on financial and technical grounds and maintenance of the existing position (i.e., status quo or no project option).
- Changing the size and operational scope of the proposed project site (Reducing & downsizing; or enhancing & upsizing).
- Shifting the project area to some other locations (site shifting).
- Construction of alternative network of smaller independent units at different locations in a much wider coverage area.

The above-mentioned possible alternatives are discussed below briefly:

8.2.1 Abandonment of the Project (No Project Option)

The first alternative option could be to abandon the project altogether and continue with the existing situation. This option is not supported by objective conditions & population size of the district.

8.2.2 Changing the Scope

The second alternative could be change in the scope of the proposed project, i.e., either reduction and downsizing the size of the projector, the scope of the services or enhancing and upgrading the same. The downsizing or upsizing would include both the area of the project. The physical constraint in upsizing the project is non-availability of additional clear land at the site. On the other hand, downsizing is likely to jeopardize economic viability of the project.

According to the proponent, both these factors have been taken into account while designing the project. As such, the object evidence does not support downsizing. Since additional land is not available at the proposed site, the upsizing option automatically becomes irrelevant, at least for the time being. Therefore, the option of change in the scope of the project is found not feasible.

8.2.3 Relocating the Project

The third possible option could be shifting, either a part or the entire project, to some other location. As mentioned in earlier, due to space constraints the project is being the undertaken at this site primarily because land is available with all the facilities at this proposed site.

Therefore, shifting of the project to some other place in or around the city is not possible because it will be firstly non-feasible and secondly, it will not serve objectives of the projects.

8.3 SUMMARY OF THE PROJECT ALTERNATIVE OPTIONS

Based on the objective analysis, views, and opinions of the stakeholders, as detailed above, various alternative options are found not feasible. Furthermore, the net socio-environmental impacts of the project are positive. Therefore, consideration of the above-discussed alternative option is not relevant to the instant project.

8.4 FINAL SELECTION OF SITE

A critical analysis was made based on the available accessibility with Reference to land availability, accessibility of site, availability of water resources, less damage to existing environment and other environmental problem. Finally selected present site of proposed project is more practicable with respect to economic, social and environmental perspective and future development for proposed steel division.

Design/technology alternatives, their selection and rejection criteria

The wastewater is characterized as highly polluted in terms of COD, BOD, TSS and Oil and grease. The primary treatment of the wastewater reduced these parameters but it cannot be discharged directly. For the treatment of the produced wastewater, numbers of the biological treatment process are available in the market for the treatment of industrial wastewater. After acquiring different proposals from renowned national and international vendors, different technologies were came into consideration that includes activated sludge process (ASP), rotating biological contactor (RBC), up-flow anaerobic sludge bed reactor (UASB), Membrane Biological Bio Reactor (MBBR). ASP and MBBR were competitors. After careful engineering sense of expertise and considering different factors like removal efficiency, capital cost, operational and maintenance cost, area footprint, sustainability and international practices, DAF systems are finalized.

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Environmental Alternatives, their selection and rejection criteria

The said project is being proposed to treat generated wastewater before its final disposal and to comply with PEQS hence, no environmental alternatives are being considered. After proposed treatment of wastewater, the quantity of wastewater generated from said facility will be reduced significantly thus improving environment's health. By doing so, the health risks associated with environmental pollution will be reduced. Moreover, the collected sludge can be used as fertilizer in nearby agricultural fields. Furthermore, the water conservation measures will be adopted i.e. the treated water will be used on-site for horticultural activities, it can be recycle and rain water harvesting pond may be constructed to harvest rainwater. Moreover, indigenous & fast growing trees will be planted along the boundary wall of WWTP and sugar mill. A lot of technologies aerobic as well as anaerobic are kept under in review while selecting the final technology. It is found that the technologies like anaerobic technologies like up-flow anaerobic sludge blanket reactor (UASB) also came into consideration. But after the comparison, in the aerobic technologies, technologies like DAF is finalized as area is owned by sugar mills management and tree plantation will be done to overcome nuisance for nearby areas like odor and fly problems occur if aeration requirement is not maintained properly.

CHAPTER 9

STAKEHOLDER'S CONSULTATIONS

9.1 GENERAL

This chapter describes the process and outcome of the consultations held with the relevant stakeholders and the neighboring community over environmental aspects of the proposed project.

Public discussions were held with the inhabitants of the surrounding area. Public consultation was conducted at site to know the point of view of the people. Majority of the people observes strong positive impacts regarding employment, business and structural development due to this proposed project. Audit report findings depict that people perceive overall positive social and economic impacts by the proposed project. Majority of the people are convinced for development in the area and they correlate this progress with the pace of their social mobility. Moreover, management of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan admitted to adopt all the measures to control any impacts resulting from the subject project.

9.2 WAYS OF PUBLIC CONSULTATION

Public Consultation was done by Scoping sessions, focused group discussion, small group meetings and way side consultations with the relevant stakeholders. Multiple fieldstrips and site visits were arranged. These visits were arranged by the environmental consultant for the collection of baseline data and public consultations to know the point of views of different stakeholders regarding the proposed project. There is no affected community present in the radius of the study area. Team visited the proposed site, had discussions with stakeholders and consulted with the local people to evaluate the project socio-economic impacts.

People provide the massive information about the project and have positive remarks regarding the project development.

9.3 OBJECTIVES AND RATIONALE OF CONSULTATIONS

The primary objective of the stakeholders' consultations was to learn and know the apprehensions, concerns and opinions of the key stakeholders over environmental implications of the project. The consultations sessions also served as a source of first-hand information about expectations of the community and beneficiaries of the project. Dialogue with the stakeholders and recording their concerns at appropriate stages of the project can help to tailor the project in line with stakeholders' aspirations and therefore likely to promote public acceptance of the project and its sub-components.

9.3.1 Summary of Issues Raised by Stakeholders

A summary of the key issues raised by stakeholders and how these are being addressed by project proponent is provided in Table below:

During consultation it was observed that majority of the respondents were in favor of proposed project as the wastewater is disposed off into channel and by reducing the pollution load in wastewater it will be reusable by consumers. The other related issues and concerns raised by general public are discussed. However, during the social survey following concerns of the local community, Government Departments and Environmental Practitioners and experts were noted:

- Nuisance must be controlled at source.
- Latest/State of the art technology must be adopted.
- Locals should be preferred for the job opportunities.
- Wastewater monitoring should be done regularly to check efficiency of

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treatment plant and to comply with PEQS.

- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- An effective EMMP should be designed and enforced with true spirit.
- Health and safety of the workers should be ensured.
- Plantation of indigenous species must be carried out at extensive scale to control odor.
- Proper disposal of sludge should be adopted.

Table 1: Summary of Issues and Commitments by Proponent

Issue	Aspect/Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for locals as they generally have less skills and training.	Employment is the main priority of the proposed WWTP. Mostly, local skilled and unskilled labor will be prioritized and also there will be job in executive level. Maximum persons according to the requirement will be employed by Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan

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Training Opportunities	People are keen to consult with subject industry if the project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for design, training infrastructure, and delivery.
Health & Safety	Truck traffic is a main concern because the road used by the project passes through a number of small communities and different industries and there will be a high volume of trucks transporting raw material or final products.	Development of Transport Management Plan including traffic safety training. Traffic advisory signs will be installed along proposed project site and all nearby specific areas.
Local Economy and Business Development	Local service providers are keen to participate in providing services to transport raw material and expect in order to adjust their businesses to meet specific needs.	The management has main focus that all the material regarding construction and operation will preferred to buy from the local market.
Environmental Issues	Dust and noise impacts, from the construction activities and in operation of mechanically un-fit machines are of concern to other residents.	Implementation of control under the Environmental Management Plan, including on and off site dust and noise monitoring.

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	Loss and change of vegetation due to soil degradation.	Thus, the rehabilitation plan has been established.
Water Quality and Quantity	Water quality and quantity and impacts from the wastewater disposal are all key concerns for nearby residents.	Implementation of consultation in relation to water use and development of Environmental Monitoring Program.

9.3.2 Stakeholder's Feedback

In consultation process, the stakeholders were briefed during scoping sessions about the objectives of the project. At the consultation meetings, the stakeholders and village representatives were informed about the project and project requirements. During the consultation meetings, all the stakeholders appreciated the project and expressed full support to the sugar mill management.

A detailed consultative process was carried in the form of official meetings, letters, and/or telephonic discussions, to consult the stakeholders for the addition of WWTP within premises of Hamza Sugar Mills Limited Jetha Bhuta Khan pur, Rahim yar khan.

Remarks given by stakeholders during the field survey are listed at the end of the report.

9.4 IDENTIFICATION OF THE RELEVANT STAKEHOLDERS

The consultation process began with identification of the most pertinent stakeholders. Efforts were made to identify the relevant stakeholders through

systematic process based on the nature and degree of their actual and perceived stake in the project.

9.5 CONSULTATION METHODOLOGY

Onsite consultations were held with representatives of the various categories of the stakeholders as were available during field visits of the proposed site for WWTP. Additionally, wherever found feasible, general public visit in the vicinity were also conducted to know their views and concerns over the project activities. The majority of these consultations were either one to one meetings or small and focused group discussions.

9.5.1 Outcome of the Consultations

The neighborhood communities did not express any specific or significant concerns. Interestingly, different stakeholders had different perceptions and different concerns about the proposed project. Some of the concerns and apprehensions relating to various aspects of the project are reproduced below:

9.5.2 Design Aspects

The design aspects need to take into account the relevant building codes, byelaws, and the applicable governmental policies.

9.6 CONSTRUCTION ASPECTS

- Delays in construction and completion of the proposed project are likely to result into escalation of construction costs.
- Construction related noise could be troublesome for the community.
- Delays in payments to the contractors, sub-contractors, suppliers and the labour can cause delays in the project implementation.
- Interference by the local regulatory agencies and the municipal authorities are also likely to cause delays in completions.

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- Delays in handing over the sites and later changes in the drawings and scope of work result into slow progress of the construction under the proposed project.
- Generations of dust and its deposition on exposed surfaces would require frequent dusting.

9.7 OPERATIONAL ASPECTS

- There could be blackish air emissions laden with harmful particles.
- There could be disruptions and discontinuations in the supply of the machinery / equipment and raw materials for timely completions of project.

9.8 PROPONENT

Possible impacts and mitigation measures related to the proposed project were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environmental friendly.

9.9 OTHER DEPARTMENTS AND AGENCIES

For the impact analysis detailed meeting were held with the management of project and local community. Issues were discuss that may affect the environment and also the implementation of the proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan (EMP). Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

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9.10 AFFECTED & WIDER COMMUNITY

There is no affected community present in the radius of the study area. Team has consulted with the inhabitants of different villages. They provided positive remarks regarding the subject project and in the favor of the proposed project activities to set WWTP. Stakeholders participation Performa's and socioeconomic questionnaire were get filed by the locals to evaluate the project socio-economic impacts.

CHAPTER 10

CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSIONS

Based on the preliminary design, environmental and social field surveys and impacts assessment of the proposed project, it may be concluded that although there are some significant negative impacts but would be of short term during the construction stage. However, there are a few negative impacts that would be expected during the operational stage but their intensity can be reduced by taking appropriate measures. The environmental issues related with the project activities are summarized as under:

Environmental Impacts

During operation stage, disposal of waste will become a problem. Therefore, proper mitigation measures may be adopted in the preliminary design including safe and environmental friendly disposal of solid waste.

Physical Impacts

Physical impacts like soil contamination, water contamination, air pollution, high noise level, etc. are of temporary nature during the construction stage. However, during operational stage by adopting abatement technologies such as de-dusting system with bag filters and development of buffer zones and green areas intensity of negative impacts can be minimized.

Biological Impacts

No forest area or wildlife sanctuary exists within the vicinity of the proposed project area, which may be affected by the project. Few reptiles like lizards and snakes and few birds like Mynah and house sparrows will be disturbed by the project activities and may have to move into nearby areas. This will be a temporary insignificant impact.

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Social Impacts

The other social issues like safety of general public and workers, security problems, community accessibility issue, etc. will be of temporary nature.

10.2 RECOMMENDATIONS

Although comprehensive mitigation measures have been suggested in the report to minimize the negative impacts and to enhance the positive impacts of the proposed project, however, major recommended mitigation measures are summarized as under:

1. Dust suppression system should be available on project site for wetting of all the materials to avoid effects of dust such as respiratory diseases.
2. All appropriate environmental management measures detailed in this report, together with any other environment management commitments should be implemented throughout the entire life of the project.
3. Water contamination, air pollution and high noise levels will be controlled with the use of good engineering practices.
4. Environmental Management Plan (EMP) recommended will be implemented in the true spirit.
5. WWTP machinery will be well-maintained for good efficiency.
6. Installed Air Pollution Control Equipment (APC) system which will be equipped with Bag Filter or any other air pollution controlled equipment.
7. First Aid measures, Health & Safety Equipment (PPEs) will be provided to the workers.
8. Safety signs or boards will be placed wherever needed within the premises of the proposed project.

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9. Personal Protective Equipment's (PPEs) will be provided and ensured that they are used by the workers during working hours.
10. Proper measures will be taken to control the air emission or high noise levels such de-dusting system will be used by the management to control air emissions.
11. High temperature zones will be highlighted.
12. Transportation vehicles will be maintained and tuned well.
13. No parameters above Punjab Environmental Quality Standards (PEQS) will be allowed in any case.
14. The parameters of the effluent will be within the permissible limits defined in the PEQS.
15. Any seepage and leakage will be controlled through proper mitigation measures.
16. Regular monitoring and auditing will be taken by the management to ensure the compliance of all the mitigation measures.
17. Proper solid waste management system must be adopted.
18. Safety signs, safety board's etc. must be placed on the project site for safety purpose of workers.
19. Plantation campaign will be initiated.