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EXECUTIVE SUMMARY

It is the intention of Mr. Muhammad Abdul Raheem / Chief Executive Officer of AAA Industry to set up a proposed poultry waste rendering unit at Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum.

Project proponent wants to obtain the environmental approval for proposed poultry waste rendering unit to produce Oil & Protein which will be dispatched to poultry feed production units by submitting the Environmental Impact Assessment EIA report to Environment Protection Agency, Jhelum for the compliance of section 13, Environmental Protection Act, 2014. The proposed total area for the processing unit is 20 Kanals and the Total project cost is 210 million Pkr.

The project falls in the Clause 9 “Poultry Protein Production Unit”, Category B “Manufacturing and Processing” of Schedule II “Categories of projects requiring Environmental Impact Assessment (EIA)” according to Environmental Assessment Rules, 2022.

Location of site area:

The subject proposed site is located at Opposite Raj Akbar Masjid, Main GT Road, Tehsil Sohawa, District Jhelum.

Project co-ordinates are as follow:

North:.....Open Area

East: Open Area (Sarhad Gas Plant)

South:.....Access Road (Main GT Road) + Open Area

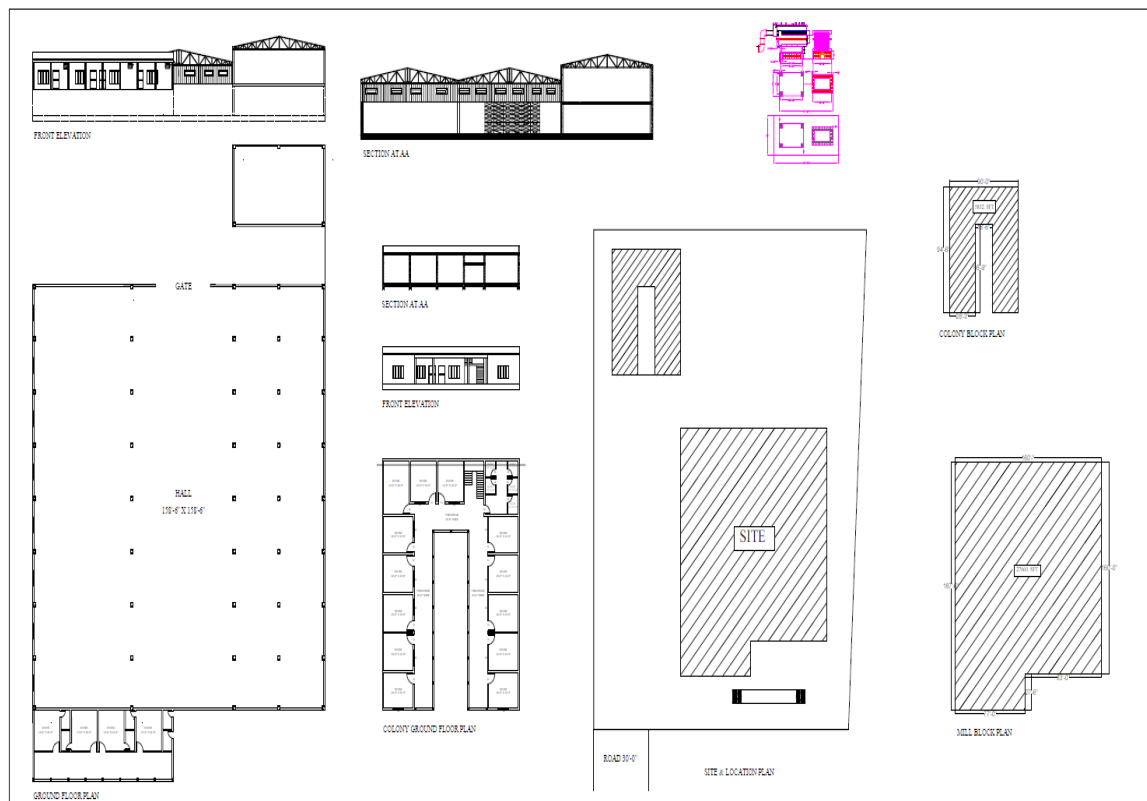
West: Open Area

Proposed site’s layout and Google Earth maps are attached as **Annexure-A & B** respectively.

Proposed Site	33°10'35.26"N	73°22'40.92"E
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Area features:



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Figure 1: Location plan of the proposed area



Aerial Map:

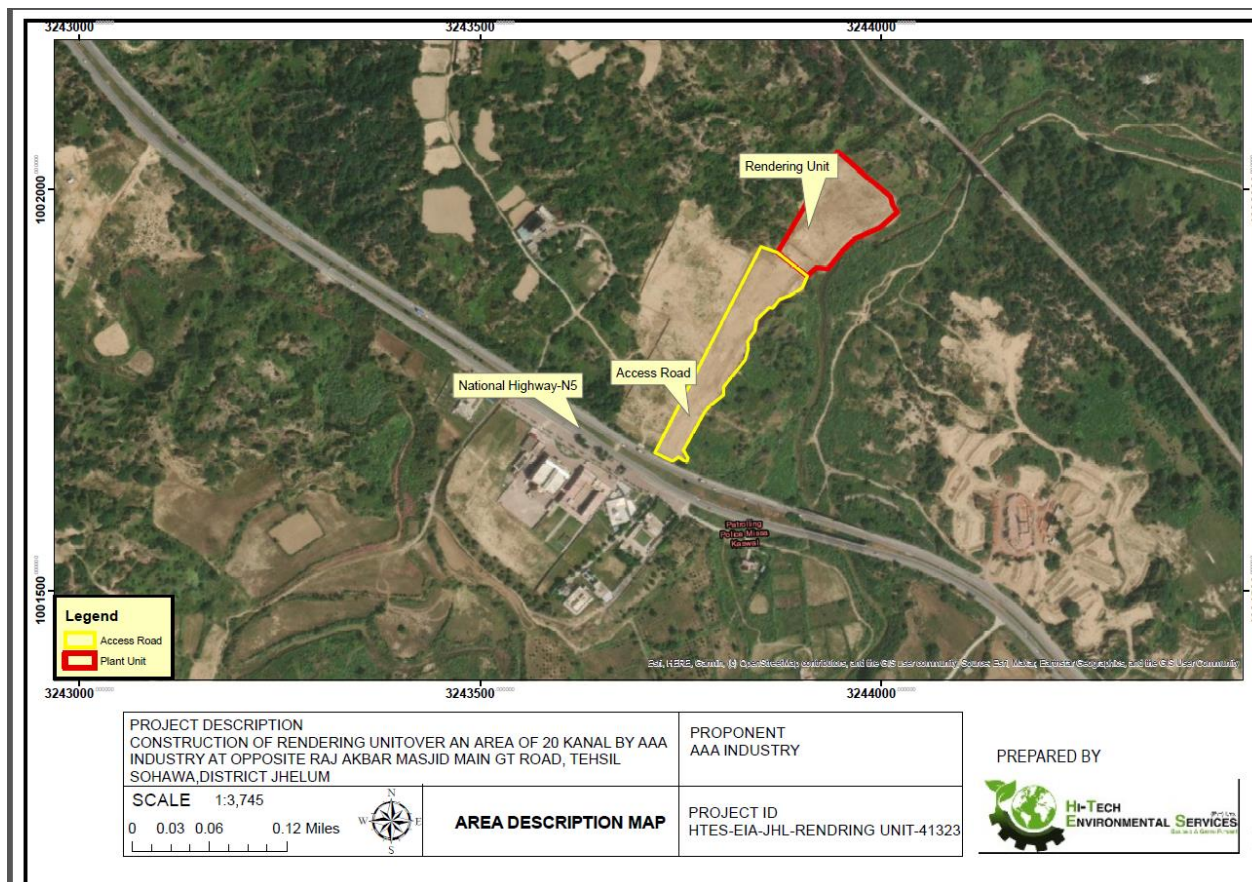


Figure 2: Aerial view of the proposed site area



Project proponent:

Table 1: Proponent's Detail

Proponent Name	Muhammad Abdul Raheem
Designation	Chief Executive Officer/ Proponent
Postal address	Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum

Environmental consultant:

Hi-Tech Environmental Services (Pvt.) Ltd. is a business entity managed by geoscientists and environmental experts. The company has the expertise of highly diversified experience and has completed a total of more than 150 environmental studies across Punjab. The consultant has a range of expertise available in following areas:

- Economic Geology
- Determination of geological exploratory techniques and mine design
- Preparation of feasibility reports, IEE report, EIA reports, Development Schemes & Prospecting Scheme.
- Preparation of Environment Management Plans
- Preparation of reports on HRD /Mines Rescue & Recovery.
- Assessment of Impact of mining on environment and mitigating measures.
- Mine surveying & interpretation of boundary disputes.
- Legal opinion on mine regulatory regime.
- Energy fuels and selection of choice fuels for specific energy
- Drilling and blasting for underground and surface mining techniques.
- Safety measures for mines operation.

Contact Details	
Consultant Company	Hi-Tech Environmental Services (Pvt.) Ltd.
Address	26-B, Zahoor Elahi Road, .
Representative	Advocate Chaudhry Awais Ahmed
Contact	(+92) 3219443210
e-Mail	consultantshtma@gmail.com info@hitechma.com



Brief outline of the proposal:

The subject project is the proposed construction of poultry rendering unit and will deals with Oil & Protein manufacturing with the help of poultry waste/ fats. Details of manufacturing process is thoroughly described in “*Chapter No. 02 – Process Description*” and Process Flow Chart is being attached with this report as **Annexure-D**. Machinery requirement for whole process is including; hybrid boiler, cooker, centrifuge machine, sieve, hammer, conveyors. Basic raw material for the manufacturing of oil & protein is poultry waste/ fat. Raw material acquired from poultry shops, farms and slaughter house will be transported to subject proposed rendering unit via collection trucks and temporarily stored in closed poultry waste collection areas. This raw material will be fed into cookers through conveyor belts and steam will be provided from hybrid boiler. After cooking the material is transported into centrifuge machines which will extract oil and water content from the material, remaining material in centrifuge machines will be placed in hammer machine which will further extract the oil content of the material. Through this process two types of products i.e., poultry-based oil & protein will be obtained. Production capacity of the proposed manufacturing unit will be 50 Ton per day.

Many industrial units are already working in the vicinity of the proposed site area as proposed site is in industrial estate. Before commencement of the subject project, it is necessary to obtain the NOC from concerned departments. So, EIA study has been carried out for the project prior to start activity in the area and to obtain the Environmental Approval from the Environmental Protection Agency.

The subject project involves the construction of infrastructure, installation of machinery in area owned by proponent having very little vegetation presence. The proposed total area for the construction of the proposed unit is 20 Kanals. Total estimated project cost will be 220 million Pkr.

Table 2: Project's Detail

Name of the proposed project	AAA Industry
Purpose of the project	Development of industrial rendering unit for manufacturing of oil & protein for poultry meal. To produce industrial raw material for further processing/ manufacturing processes of poultry feed. To enhance economic growth of the country.
Process Details	



Manufacturing Process	Rendering of poultry waste
Raw Material	Poultry waste from poultry shops, farms and slaughters
Finished Products	Oil & Protein
Intermediate Products	Nil.
By Products	Wastewater, Air emissions
Capacity	50 Ton/ day
Land Requirement	
Total Area allocated for proposed project	20 Kanals
Covered areas of plot	• Waste material area (1): 14500 SFT. • Waste material area (2): 7500 SFT • Cooker hall: 3190 SFT • Hall: 5227 SFT • Admin block: 853 SFT • Septic tank/ WWTP: 108 SFT • Weigh scale: 1200 SFT • Operators block: 998 SFT • Parking: 1300 SFT
Status and location	
Location of the proposed site	Opposite Raj Akbar Masjid, Main GT Road, Tehsil Sohawa, District Jhelum.
Description of project	In the process, poultry rendering unit will deal with Oil & Protein manufacturing with the help of poultry waste/ fats. Machinery requirement for whole process is including; hybrid boiler, cooker, centrifuge machine, sieve, hammer, conveyors. Basic raw material for the manufacturing of oil & protein is poultry waste/ fat. Raw material acquired from poultry shops, farms and slaughter house will be transported to subject proposed rendering unit via collection trucks and temporarily stored in closed poultry waste collection areas. This raw material will be fed into cookers through conveyor belts and steam will be provided from hybrid boiler. After cooking the material is transported into centrifuge machines which will extract oil and water content from the material, remaining material in centrifuge machines will be placed in hammer machine which will further extract the oil content of the material. Through this



	process two types of products i.e., poultry-based oil & protein will be obtained.
Water Requirement	
Water consumption for the project	800-1000 Gallons/ day during construction phase. Approx. 15 m ³ /hr. water will be required for rendering process i.e., for boiler & scrubbing system. Water will also be used for domestic purpose as per average daily consumption rate at workplace.
Ways of extraction	Motor pump
Source of Water consumption	Underground.
Amount of waste water	Wastewater will be generated from condenser, scrubbing system i.e., approx. 4-5m ³ /hr. For domestic activities, 60-70% of used water.
Source of waste water	Constructional, Domestic and Process wastewater.
Mode of treatment	During land development site camp septic tanks will be installed for the treatment of domestic and constructional wastewater. During the operational phase of the project, WWTP will be constructed to treat wastewater from condenser and scrubbing system consist of chemical & biological treatment process i.e., sedimentation, coagulation, chemical injection/ spraying, aeration. septic tanks will be constructed for the treatment of wastewater from domestic consumption; It can be used for plants and sprinkling purposes or disposed off in nearby drain.
Solid Waste	
Source of solid waste generation	Construction and Domestic sources
Mode of disposal	Will be handed over to contractors
Solid waste during operation of unit	Domestic, Office waste
Manpower	
Labor Force	About 25-30 person during construction
Labor Force	About 60-75 person during operation



Power requirements	
Source of power	Power requirements at the project site will be fulfilled by WAPDA/Solar Panel/ Industrial estate electricity supply/ standby power generator.

Study area:

The present EIA study area for said activity is industrial and various industrial units are already working in the vicinity of the proposed site area as shown in Google Earth Map attached as **Annexure-B**.

Major impacts:

In order to identify all the activities associated with the project during construction and operation phases with potential to cause adverse environmental impacts and harm a thorough review has been conducted. The subject project area lies within industrial estate. In case of impact arises from the project activities then possible necessary measures will be adopted to control them. Overall, the project has positive impacts on the local population in terms of employment opportunity and economic activity in their area and country as a whole but also has some negative impacts which will be controlled through proper safety measures, mitigation measures and SOPs. As proposed site area is having very scarce amount of vegetation mainly grass/ herbs, so clearing/ cutting of trees will not be an issue but restoration & reclamation after construction phase will be done by the native species. If proper implementation of EMP and suggested mitigation measures will be adopted by AAA Industry, then any further or residual impacts can be minimized.



Table 3: Potential Construction Phase Impacts

SUMMARY OF IMPACTS DURING CONSTRUCTION PHASE		
Potential Impacts	Criteria for determining Significance	Key Mitigation Measures
Gaseous/ PM Emissions— Dust/ PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site.	An increase in visible dust beyond the boundaries of the construction site; or Concentration of PM ₁₀ in excess of 150 µg/m ³ NEQS for Ambient Air	Sprinkling of water on dusty roads, tracts and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Use of wind shield around stockpiles is recommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks; Face masks should be strictly implemented for labor working on the project.
Construction Noise— Noise may be generated during landscaping activities and from generators and transportation vehicles at the project site; which may be a nuisance for the workers.	OSHA standards	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the site generator to avoid the vibration. • Site generator should be placed in canopy/ room to minimize noise spread.
Solid waste Management— If solid waste will not be managed properly, it may cause negative impacts	Generation of excessive waste; Recyclable waste and reusable waste is discarded; Improper disposal	Constructional waste should be utilized for land filling and maintenance purposes; Domestic waste should be disposed off properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.



		Temporary handling & storage site should be designated.
Vegetation Loss/ Soil erosion — Minor negative impact may arise as only some weeds and grasses are present at the project site which will be cleared for the purpose of construction.	Unnecessary or excessive removal of trees and shrubs.	No tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation and trees. Preparation of a Reinstatement/ Plantation Plan to restore the land after the constructional activities is recommended. Native trees/ plants will be planted along with boundary walls and in designated sites.
Soil Contamination —Oil and chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Wastewater- generated from constructional & domestic activities.	Environmental implications if disposed off untreated. Prevention of diseases spread.	Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be used to sprinkle over ground. Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream. An appropriately designed septic tank will be used to treat sewage/waste water to achieve Compliance of NEQS. Periodic cleaning of the septic tank is recommended
Socioeconomic impacts—Inter-cultural differences between the project staff from other areas and the local community may arise due to the subject project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and	No community complaints Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people to maximum extent possible.



economic growth.		
Health and safety issues- may arise due to improper handling of work and if precautionary measures will not be adopted.	OSHA Standards	Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/medical facility should be provided at the project site. Safe drinking water must be provided to workers and staff. Safety signs & boards should be placed during constructional activities. Construction site should be fenced properly to avoid any damage to nearby settlements. Smoking or any drugs should be prohibited during working hours or performing work. At the time of earthwork, fencing will be ensured for the area under the exploration.

Table 4: Potential Operational Phase Impacts

SUMMARY OF IMPACTS DURING OPERATION PHASE		
Potential Impacts	Criteria for determining Significance	Key Mitigation Measures
Air Emissions- During the operational phase of the project, gaseous emissions from project related activities and power sources may affect the air quality of the project area. Project activities i.e., cooking of poultry waste can also impact the ambient air through VOCs. Air emissions i.e., CO, CO₂, SO_x, NO_x from boiler.	NEQS for Ambient Air NEQS for Stack Emissions	Industry should ensure the NEQS compliance and should not be allowed to emit hazardous pollutants. Boiler should be operated on natural gas which has low emission potential as compared to other fuel sources. Air Emission Control Measures are recommended to control the air emissions from hybrid boiler i.e., Cyclone, Scrubbers. Air Emission Control Measures are recommended to control the air emissions from condensate (VOCs) i.e., Condenser with scrubbing system to eliminate fumes. Raw materials should be kept in covered cool, well-ventilated area to prevent foul smell due to decomposition products.



		Raw material should be utilized as early as possible & not be kept in waste storage halls more than a day. Regular cleaning and hygiene of waste storage halls should be ensured. Maximum possible plantation is recommended as it absorbs gaseous emissions as well as prevent lower atmospheric dust to move along with the air action. All project related machinery, standby generators, boiler will be checked regularly to ensure that are in sound working condition and are not emitting smoke. Regular monitoring as per NEQS is recommended for ambient air and stack emissions. Proponent should keep the records of monitoring and equipment maintenance.
Noise- Noise due to industrial activity, machinery and generators can be a nuisance for the workers in the working area.	NEQS for ambient noise level. OSHA standards for covered working areas.	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff in case of noise at the project site. • Sound proof/ covered buildings should be built for placement of machinery i.e., generators (if any) to be installed at the project site to control the noise. • Proper tuning of machinery is recommended. • Rubber wounds/ vibration control platforms should be placed underneath the machinery/ generator to avoid the vibration. • Maximum plantation is recommended within site area as it absorbs the noise waves and act as barrier. • Regular monitoring as per NEQS/ OSHA standards and record keeping is recommended.



Discharge of wastewater- The discharge of untreated industrial effluents or municipal wastewater may be a negative impact of the subject project.	NEQS for Municipal and Liquid Industrial Effluents (mg/l, unless otherwise defined)	Industry should construct treatment facility to treat its wastewater before its final disposal. Rendering plant can generate more than one source of wastewater streams i.e., Condensate & washing activities, this process wastewater needs to be treated through chemical & biological treatment processes i.e., coagulation, sedimentation, chemical spraying/ injection, aeration etc. as it can contain TSS, BOD, Nitrogenous compounds i.e., ammonia. Wastewater generated from domestic activities, septic tanks will be constructed to treat it before disposal/ reuse. Treated wastewater will be used for plantation or can be used for sprinkling purpose on unpaved areas or simply drained out in nearby local drain present along with the northern boundary of the proposed site. Compliance of NEQS for Effluents should be ensured. Monitoring should be conducted as per NEQS and record should be maintained.
Health & Safety Issues- different operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.	OSHA Standards	An HSE department should be established to look after the worker and community's health, safety & environment related issues, headed by HSE officer. Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/ medical facility should be provided at the project site. Safe drinking water must be provided to workers and staff. Safety signs & boards should be placed during operational activities. Smoking or any drugs should be prohibited during working hours or performing work. Fire Fighting Arrangements/ Equipment should be installed and responsibility should be assigned for firefighting in emergency situation.



		SOPs for operational activities should be formulated and implemented. Keep the workplace especially storage halls clean and hygienic to avoid foul smell and spread of diseases due to decomposition of waste & raw material should be placed in covered cool & well-ventilated halls. Regular review meetings should be arranged to assess the efficacy of EMP.
Soil Contamination— leaching from storage sites, Oil and chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil.	Raw material i.e., poultry waste should be stored in properly constructed covered paved area to prevent leaching of contaminants in soil. i.e., in rainy seasons. Oil produces from the rendering process should be stored in safe storage and regular inspection & monitoring of the storage site should be done. Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated if hydrocarbon based spillage occur.
Solid waste management- If solid waste will not be managed properly, it may cause negative impacts.	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	Solid waste from the domestic sources should be disposed off properly by following SOPs onto designated sites. Proper solid waste management system is recommended for unit. Separate waste bins should be placed at suitable places. Ensure regular cleaning and collection of solid waste from waste bins and halls and should be transported to designated solid waste management/ collection site. 3R's of sustainability are recommended to achieve.
Biodiversity- untreated wastewater disposal can impact the downstream biodiversity as it can impact the dissolved	High BOD level of wastewater; Reduction in DO of water;	Proper wastewater treatment plant is recommended having chemical and biological treatment system to tackle TSS, BOD, COD. Regular monitoring of wastewater as per NEQs is recommended.



oxygen of the downstream water body.	pH fluctuations;	
Odor- condensate from the water can cause foul smell as it contains VOCs. Unhygienic and delayed storage of raw material can cause severe odor.	Unhygienic work/storage practices. Storage of raw material more than a day. Poor ventilation and high temperature of storage halls.	To reduce odor from the condensate ammonia stripping and scrubbing with cool water is recommended. Storage halls should be regularly wash and wastewater should be treated in WWTP. Proper hygienic conditions should be maintained at site. Storage halls should be constructed is a way to ensure adequate ventilation and maintain low temperature inside. Raw material should not be kept for days as decomposition can initiate in 24-48 hours.
Socioeconomic impacts —Inter-cultural differences between the project staff from other areas and the local community may arise. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	No community complaints Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people as possible.

Proposed environmental monitoring:

To oversee the environmental performance of the project through its lifecycle enforcing the NEQS an Environmental Monitoring Program has been conducted which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with NEQS and legal obligations. It has been showed that all the parameters are within the range of prescribed limits of NEQS during baseline monitoring surveys. Lab analysis results by EPA certified lab are incorporated within this report as Appendices-IX.

**Flue Gases:**

Monitoring for stack emissions should be conducted as per EPA NEQS rules and standards and report should be submitted to concerned Environment department.

Noise:

Monitoring for noise level should be conducted as per EPA NEQS rules and standards and report should be submitted to concerned Environment department.

Water quality:

Monitoring for wastewater & drinking water quality should be conducted as per EPA NEQS rules and standards and report should be submitted to concerned Environment department.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent.



CHAPTER – 1 **INTRODUCTION**

This section of the report provides an overview of the rational of the project, objective of the project, why it is to be establish, purpose of the study, an approach adopted to conduct single stage Environmental Impact Assessment (EIA) for the proposed project of AAA Industry at Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum.

The subject project is development of manufacturing/ processing unit over a total area of 20 Kanals for production of 50 Tons/ day Oil & Protein. EIA study is being carried out for the project prior to start any activity in the area. In subject project process, poultry waste collected from local sources on daily basis to be consumed at site through rendering process by the means of cooker, boiler etc., and convert the poultry waste/ fat into oil and protein to be used in poultry feed manufacturing.

Project proponent intends to obtain approval for the proposed oil & protein processing unit by submitting the Environmental Impact Assessment EIA report to concerned Environment department.

Overview of the AAA Industry Processing:

AAA Industry is already working in industrial rendering sector to recycle/ reuse the poultry waste which otherwise ends up in landfills and cause severe environmental impacts or to illegal processing plants without complying the national laws and regulations.

Management of the AAA Industry is also operating the rendering unit at Rawalpindi, producing quality approved oil & protein for poultry feed mills and also complying with relevant national laws and regulations.

Project benefits:

The project has been developed in response to a number of driving forces, including;

- Economic development
- Contribute to poultry industry development
- Provision of raw material for poultry feed manufacturing
- Recycling/ reuse of poultry waste and reducing the load of landfills
- Poverty reduction by employment
- Development of industrial infrastructure



- Improve living standard of the area by promoting economic activities
- Contribute into national GDP
- To provide better opportunities for the nearby vicinity including skilled and unskilled workers

Purpose of the study/ report:

The purpose of the report is to obtain the Environmental Approval for proposed rendering unit from the concerned Environment Department for proper execution of the project.

The EIA report has been prepared keeping in view the following Regulations and Guidelines:

- National Environmental Quality Standards (Self-monitoring and reporting by the industry)
- National Environmental Policy, 2005
- Pakistan EIA procedures
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectoral guidelines.

The purpose of the EIA study is to identify the possible and beneficial environmental impacts of the proposed project and propose the practical mitigation measures to be implemented to minimize the negative impacts of the subject proposed project. The specific stages of EIA study are:

- Review of available documents
- Site survey
- Overview of different project alternatives
- Collection of baseline data related to physical, ecological, and social domain of environment
- Evaluation of project impacts on environment and social settings
- Public Consultation with the stakeholders
- Suggestion, mitigation measures of adverse impacts for the proposed project
- Preparation of Environmental Management Plan (EMP)
- Preparation EIA report



Scope of the study:

The scope of study includes the preparation of single stage Environmental Impact Assessment (EIA) study of the proposed project for obtaining the environmental approval from the concerned environment department for the compliance of section 12 of Punjab Environment Protection Act, and to ensure compliance with the NEQS. The scope of study includes baseline survey of the proposed project, collect relevant data from primary and secondary sources, assess the impacts related to the subject project, suggest the mitigation measures to control the anticipated impacts, formulate the environmental monitoring program to check the environmental parameters at NEQS, prepare an Environmental Management plan to implement the recommended mitigation measures, consultation with the stakeholder or nearby community to know their concerns regarding the subject project.

Identification of the project:

According to the Pakistan Environment Protection Act, and approval of environmental assessments, the present project is categorized in the Clause 9 “Poultry Waste Processing Unit/ Rendering Unit”, Category B of Schedule II “Categories of projects requiring Environmental Impact Assessment (EIA)”.

Proponent detail:

Proponent Name	Muhammad Abdul Raheem
Address	House No. 35, Street Muzaffar Colony, Multan Road, Lahore

Details of consultant:

Hi-Tech Environmental Services (Pvt.) Ltd. is a business entity managed by geoscientists and environmental experts. The company has the expertise of highly diversified experience and has completed a total of more than 150 environmental studies across Punjab. The consultant has a range of expertise available in following areas:

- Economic Geology
- Determination of geological exploratory techniques and mine design
- Preparation of feasibility reports, IEE report, EIA reports, Development Schemes & Prospecting Scheme.
- Preparation of Environment Management Plans
- Preparation of reports on HRD /Mines Rescue & Recovery.
- Assessment of Impact of mining on environment and mitigating measures.
- Mine surveying & interpretation of boundary disputes.



- h) Legal opinion on mine regulatory regime.
- i) Energy fuels and selection of choice fuels for specific energy
- j) Drilling and blasting for underground and surface mining techniques.
- k) Safety measures for mines operation.

Contact Details	
Consultant Company	Hi-Tech Environmental Services (Pvt.) Ltd.
Address	26-B, Zahoor Elahi Road, .
Representative	Advocate Chaudhry Awais Ahmed
Contact	(+92) 3219443210
e-Mail	consultantshtma@gmail.com info@hitechma.com

Table 5: Detail of EIA team

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1	Engr. Maryam Nazir	Mining Engineer and GIS Management B.Sc. Mining Engineering	Development of Maps
2	M. Hamza Tariq	Environmental Scientist B.S Hon. Environmental Sciences	Impacts Assessment and Proposing their Mitigation Measures. Preparation of Environmental Management Plan (EMP) Preparation of Environmental Monitoring Plan (EMP) Author of IEE Report
3	Engr. Harris Naeem	Mining Engineer and GIS Management B.Sc. Mining Engineering	Author of IEE Report Development of Maps
4	Ch. Awais Ahmad	LLM (London)	Site Visits Legal Reviews Coordination with Locals



Nature, size and location of the proposed project:

The subject project is the proposed construction of poultry rendering unit and will deals with Oil & Protein manufacturing with the help of poultry waste/ fats. Details of manufacturing process is thoroughly described in “*Chapter No. 02 – Process Description*” and Process Flow Chart is being attached with this report as **Annexure-D**. Machinery requirement for whole process is including; hybrid boiler, cooker, centrifuge machine, sieve, hammer, conveyors. Basic raw material for the manufacturing of oil & protein is poultry waste/ fat. Raw material acquired from poultry shops, farms and slaughter house will be transported to subject proposed rendering unit via collection trucks and temporarily stored in closed poultry waste collection areas. This raw material will be fed into cookers through conveyor belts and steam will be provided from hybrid boiler. After cooking the material is transported into centrifuge machines which will extract oil and water content from the material, remaining material in centrifuge machines will be placed in hammer machine which will further extract the oil content of the material. Through this process two types of products i.e., poultry-based oil & protein will be obtained. Production capacity of the proposed manufacturing unit will be 50 Ton per day. Before commencement of the subject project, it is necessary to obtain the NOC from concerned departments. So, EIA study has been carried out for the project prior to start activity in the area and to obtain the Environmental Approval from the Concerned Environment Department.

Location of the project area:

The subject proposed site is located near Phase-5, Road R-17, Hattar Economic Zone, District Haripur.

Project co-ordinates are as follow:

North:.....Open Area

East: Open Area (Sarhad Gas Plant)

South:.....Access Road (Main GT Road) + Open Area

West: Open Area

Proposed site's layout and Google Earth maps are attached as **Annexure-A & B** respectively

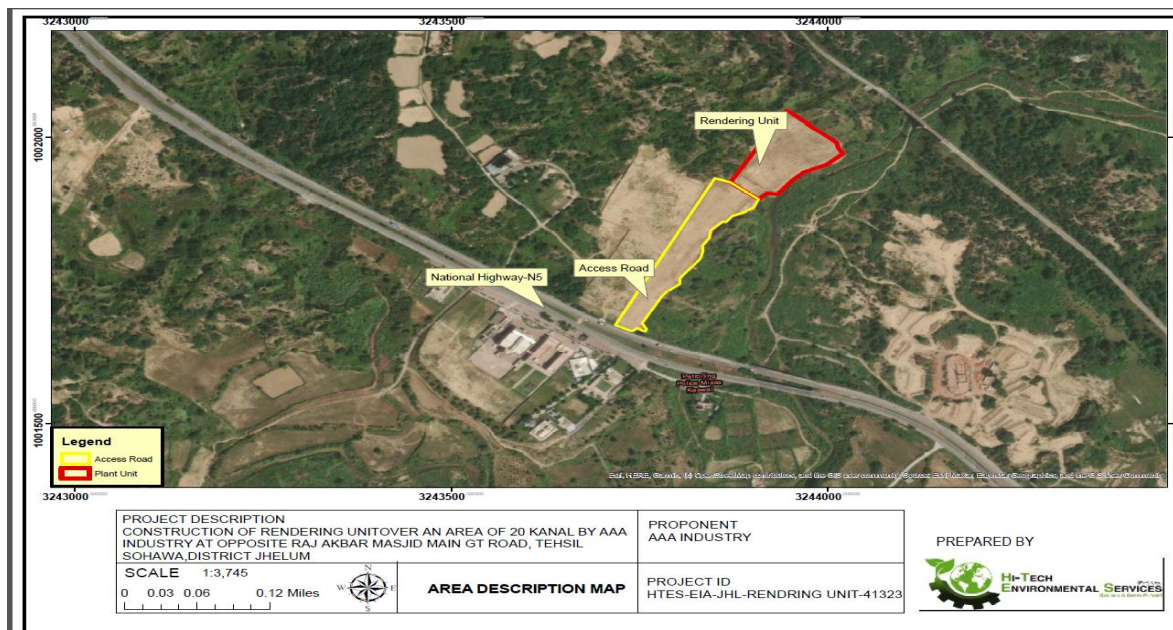


Figure 3: Proposed area view

Methodology for conducting EIA study:

The methodology adopted to carry out the single stage EIA study of the proposed project was as follow;

- A) Orientation
- B) Planning of Data Collection
- C) Data Collection
 - a. Site Reconnaissance
 - b. Analysis of Maps and Plots
 - c. Literature Review
 - d. Desktop Research
 - e. Discussions & meetings with stakeholders
 - f. Public Consultations
 - g. Field Studies

Environmental baseline survey of the project area:

To conduct the environmental base line study of the project, a multidisciplinary team was involved comprising engineers, environmentalist and sociologist. Prior to start of the base line environmental survey, a checklist was developed. The major components which were considered for physical, ecological and social environment are discussed in the subsequent paragraphs.



Physical Environment

For collecting the information on the physical environment, following main parameters were considered:

- a) Land Resources
- b) Water Resources
- c) Climate, Air and Noise Quality
- d) Other Infrastructure

Biological Environment

For biological environment study, the following parameters were covered:

- e) Flora
- f) Fauna
- g) Endangered Species (both flora & fauna)

Social and cultural study

To collect the social base line study of the project area, social survey was conducted to accomplish the following specific objectives:

- h) To identify the potential project affected persons (if any) in the project demarcated area
- i) To identify poor and vulnerable groups and strategies to ensure that such groups will get benefit from the project
- j) To identify the effects on available common resources of the community due to implementation of the project

Screening of potential environmental impacts and mitigation measures:

After thorough review of the field notes, data collection, extent of proposed project activities and detailed discussion with design team, the potential impacts of the project were assessed and safety measures were proposed to mitigate the negative impacts and to enhance the positive impacts. The potential impacts and mitigation measures were assessed covering the following parameters:

- Environmental impacts due to project location
- Environmental impacts related with design
- Environmental impacts associated with the construction
- Environmental impacts resulting from the project operation.



Preparation of environmental monitoring program and institutional requirement:

An Environmental Monitoring Program (EMP) depicting the mitigation measures and monitoring plan was also developed. Institutional capacity building of project was also reviewed and enhancement was proposed for effective implementation of the EMP.

EMP has been developed for effective implementation of the recommended mitigation measures. The EMP included controls to minimize the identified impacts, and monitoring program to monitor residual impacts, if any, during the operation. The EMP also lays down procedures to be followed during the operation of the project and identifies roles and responsibilities for all concerned personnel during the project, including reporting in operational phase.

Reporting:

The Environmental Impact Assessment Study presents the findings and compiles all the information into one document that includes:

- Introduction
- Methodology for undertaking the EIA study.
- Description of the project.
- Information relating to the background environmental conditions in the area.
- Identification of environmental impacts.
- Evaluation of the significance of environmental impacts.
- Recommended mitigation measures and monitoring requirements.
- Development of Environmental Management Plan (EMP).
- Environmental Monitoring Program
- Participation of Stake holders
- Conclusion & Recommendation

Submission and review of draft:

Hi-Tech Environmental Services (Pvt.) Ltd has given one copy of the draft report to the proponent for review. The objective was to give the client an opportunity to review the findings of the study. Ambiguities that the client had regarding the study were clarified, and suggestions/recommendations voiced for inclusion were added in the final report.

Final Report:

Hi-Tech Environmental Services (Pvt.) Ltd reviewed the feedback obtained from the project proponents and all their comments were incorporated as changed in the draft report. One hard



and one soft copy of the final report were submitted to proponent of M/s MS Oil & Protein Processing.

Structure of the Report:

The EIA report is divided into executive summary & 7 chapters as:

Executive Summary

Chapter 1: Covers introduction to proposed project

Chapter 2: Presents Project Description

Chapter 3: Describes the existing Environmental Baseline conditions of the study area

Chapter 4: Exhibits the Impacts Assessment and their Mitigation Measures

Chapter 5: Outlines the EMP to implement the suggested mitigation measures

Chapter 6: Explains the Stakeholders Participation

Chapter 7: Gives the Conclusion and Recommendations Reference



CHAPTER - 2

DESCRIPTION OF PROJECT

This chapter characterizes the project detail, type and category of project, location and site layout of the project, land use on the site, road access, vegetation feature of the site, cost and magnitude of operation, schedule of implementation, description of project (process flow chart/ steps), restoration and rehabilitation plans, government approvals.

Type and category of project:

According to *Punjab Environment Protection act, 2022*, The project falls in the Clause 9 “Poultry Waste Processing Unit/ Rendering Unit”, Category B “of Schedule II “Categories of projects requiring Environmental Impact Assessment (EIA)”.

Project overview:

Table 6: Project overview

Project name	Proposed Construction of AAA Industry
Proponent of project	Muhammad Abdul Raheem
Nature of project	Manufacturing of Oil & Protein
Process adopted	Poultry waste/ fat rendering process
Location of project	Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum.
Total area of project	20 Kanals

What is Rendering process?

The poultry rendering process focusses on handling by-products of the poultry slaughter process that are not intended for human consumption and transforming them into valuable proteins, minerals and oils. Poultry is a general term used for animals such as chicken, turkey, ducks, geese but in proposed unit only chicken waste will be utilized. Poultry by-products consist of soft meat, feathers, blood, and deboning residue.

The processing of poultry by-products starts with raw material handling, followed by heat treatment to reduce the moisture content and to kill micro-organisms. Separation of the melted oil from the solids (protein) is achieved through draining and pressing. The solid fraction is then ground into a powder.

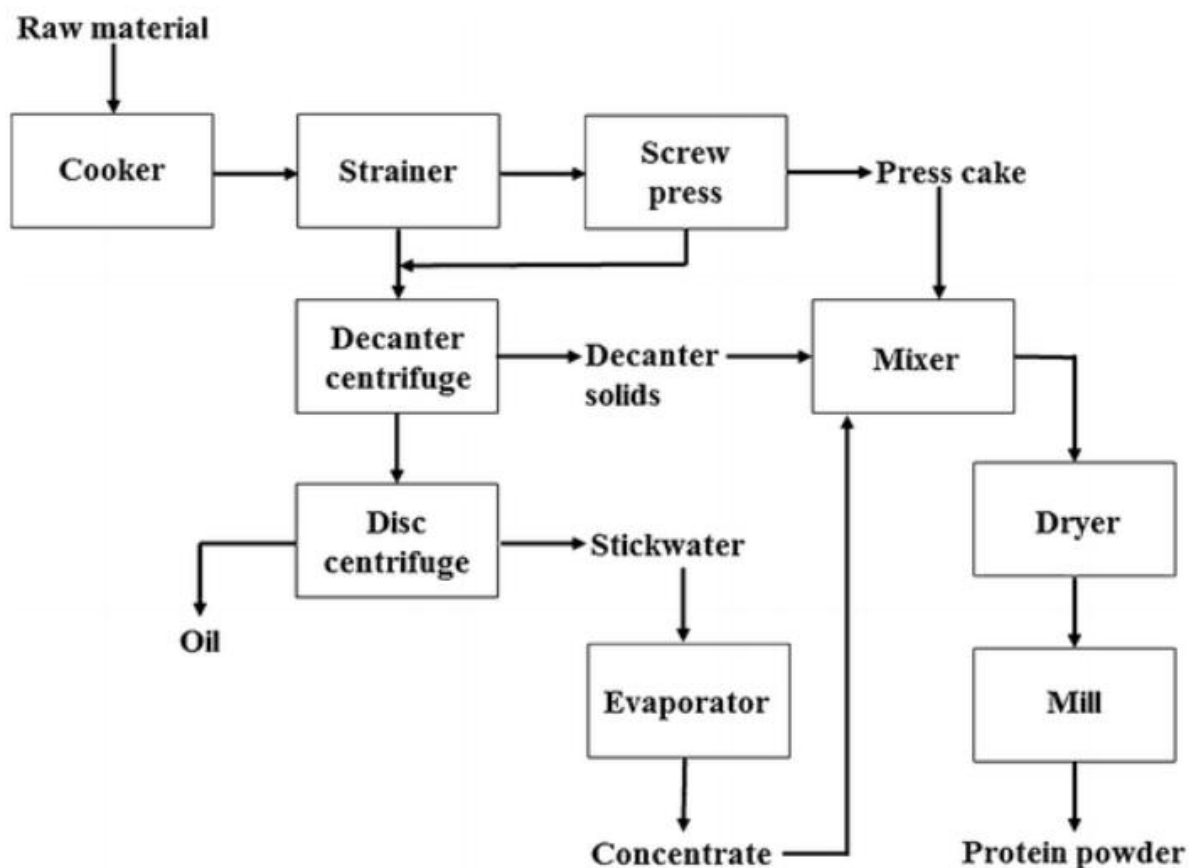


Figure 4: Process Flow of Rendering Process

Usage of Rendering Products (Oil & Protein):

Rendering based oil & protein is an important raw material for animal feed manufacturing industry. Oil & protein acquired from poultry waste/ byproduct-based rendering process is a good reuse strategy for poultry feed making. Oil/ tallow can also be used in soap making process.

Chicken meal is high nutrition value for the poultry feed and have major market for the same. Major benefits of using the chicken meal is poultry feed ingredients. The chicken meal is containing moderate to high levels of amino acids like lysine, methionine, and threonine. If processed properly the amino acids are highly available. The chicken meal is rich source of digestible protein and minerals. The chicken rendering will help sustain animal agriculture by transforming waste animal tissues in to valuable chicken meal.

Chicken meal i.e., product of rendering contains following contents:



Protein	65-75%
Fat	5%
Fiber	4%
Moisture	10%



Figure 5: Chicken Meal (Protein)

Process Details:

Transportation & Storage:

Foul smell is the major impact of the transportation & storage process, due to mishandled waste material/ poultry byproduct smell can erupt and may also spread diseases by pathogenic impact. The trucks should be covered and sanitized before loading on the farm/ shop and after unloading in the rendering plants. Insulated trucks are preferred. Ideally, animal collection areas should be located near access roads so that rendering trucks may maintain a minimum setback from farm facilities and fixed traffic areas.

When the quantity of poultry byproduct received exceeds the processing capacity of a rendering plant, it is necessary to stop the acquisition of raw material as a surplus of raw material can last more than 1 day which will generate foul smell by decomposition. Furthermore, carcass storage areas and the surrounding vicinity should be located in areas will minimize the spread of disease and will be thoroughly cleaned before and after use. Storage area should be covered, cool & well ventilated.



Process Equipment:

Cooking system, Boiler, Evaporators, Separators (Centrifuge machine) and conveyors and hammer mills are the equipment types most likely to be used on a continuous basis;

Cooking system:

An integral part of any continuous rendering system is the cooker, comprised of sections of pre-heater and heater. Cookers are constructed in a cylindrical form through which the ground carcass material is conveyed by means of a rotor or agitator in the form of a screw conveyor. For efficient heat energy use and transfer, most cylinders and agitators are steam heated.



Figure 6: Cooker for Rendering process

Boiler:

Boiler is used to provide high temperature steam into the cooker for better rendering by reducing time mainly. Steam is acting as heat source for crackling of fats.

Hybrid boiler will be used for the proposed project process; Natural gas/ HFO/ Coal will be used as fuel source as per availability but priority will be to natural gas as it generates less atmospheric emissions.



Pressing unit:

Pressing units may be used to press the input materials going to the cooker or the output products from the cooking process. When the materials roll along with press screws, the empty gap cross section (between the screws) will decrease. The materials are subjected to steadily increasing pressure that causes an efficient squeezing of the wet material. The liquid materials (mainly water and fat) escape through the perforated strainer plates around the screws and are collected in a tray equipped with a discharge pipe. The solid or pressed, dewatered, and defatted material is discharged axially at the end of the press and falls down onto a suitable conveying system.

Solid-Liquid Separator (Centrifuge machine):

Although tallow, water, and solid protein stay at three different levels in the rendering tank, each fraction has considerable impurities. Separation is achieved using both simple and sophisticated separation tools such as decanters, strainers and centrifuges.

specified three purposes of centrifuge/ decanters for clarification of rendered products, namely;

- (1) primary clarification of tallow,
- (2) dewatering of coagulated blood solids, and
- (3) dewatering of solids from effluent.

They recommended using centrifuge machine for removal of solids from slurry containing 30%– 40% solids. A drum rotating at 3000–4000 rpm (revolutions per minute) separates the liquid phase, which remains close to the axis of rotation of the machine, from the solid content or heavier phase, which goes to the outside of the rotating drum. The solids are transported along the shell to the conical section with the aid of a screw and are discharged.



Figure 7: Centrifuge machine



Based on the application of centrifugal force, effective separation of tallow, water, and solid protein can be achieved. Various types of centrifugal separators, such as decanters and disc-type high-speed separators are used in the rendering industry.

Odor Control Equipment:

Odor control equipment systems include condensers, scrubbers & afterburners.

Condensers — Since carcass material boils off during cooking and to some extent during drying processes, these steps generate steam with the strongest odors. Condenser units wash the cooking steam with cold water and then liquefy all condensable materials (mainly steam and water-soluble odorous chemical compounds).

This process reduces the temperature of the non-condensable substances to around 35–40 8C (95– 104 8F) and transfers the heat. The cooling water removes up to 90% of odors and recovers heat energy from the cooking steam.

Scrubbers — Although the condensing unit absorbs water soluble odors, it is not capable of absorbing chemical compounds, which are released from the condenser. To address this problem, two chemical scrubbing systems have been used. The venturi type scrubber is used for facilities generating low-intensity odors, and the packed bed scrubber with various chemicals is used if process generating high-intensity odors.

Depending on the chemical composition of odors produced, different chemical solutions can be utilized. To prevent the generation of odorous chlorinated compounds from ammonia and amine materials during the rendering process, an acid pre-wash (such as dilute sulfuric acid, pH 1.6/ acidic sodium hypochlorite with pH = 5.0) is used in the first-stage scrubber. Then, a second stage scrubbing is accomplished with strong alkaline (pH 12–13) sodium hypochlorite with considerable excess of available chlorine/ sodium hydrogen sulfite and sodium hydroxide in sequential order can be used in the second stage to remove aldehydes. A condenser followed by a two-stage scrubbing unit can provide up to 99% odor reduction.

Afterburners — An afterburner can be used with the final exhaust stack as excessive preventive measure. Afterburner is used to burn the gases released from the exhaust side of a scrubber, it can eliminate the chance of VOCs/ gases release in the atmosphere i.e., hydrogen sulphide, mercaptans, and amines. The requirements for complete burning are a residence time of 0.5s and a temperature of approx. 750°C.

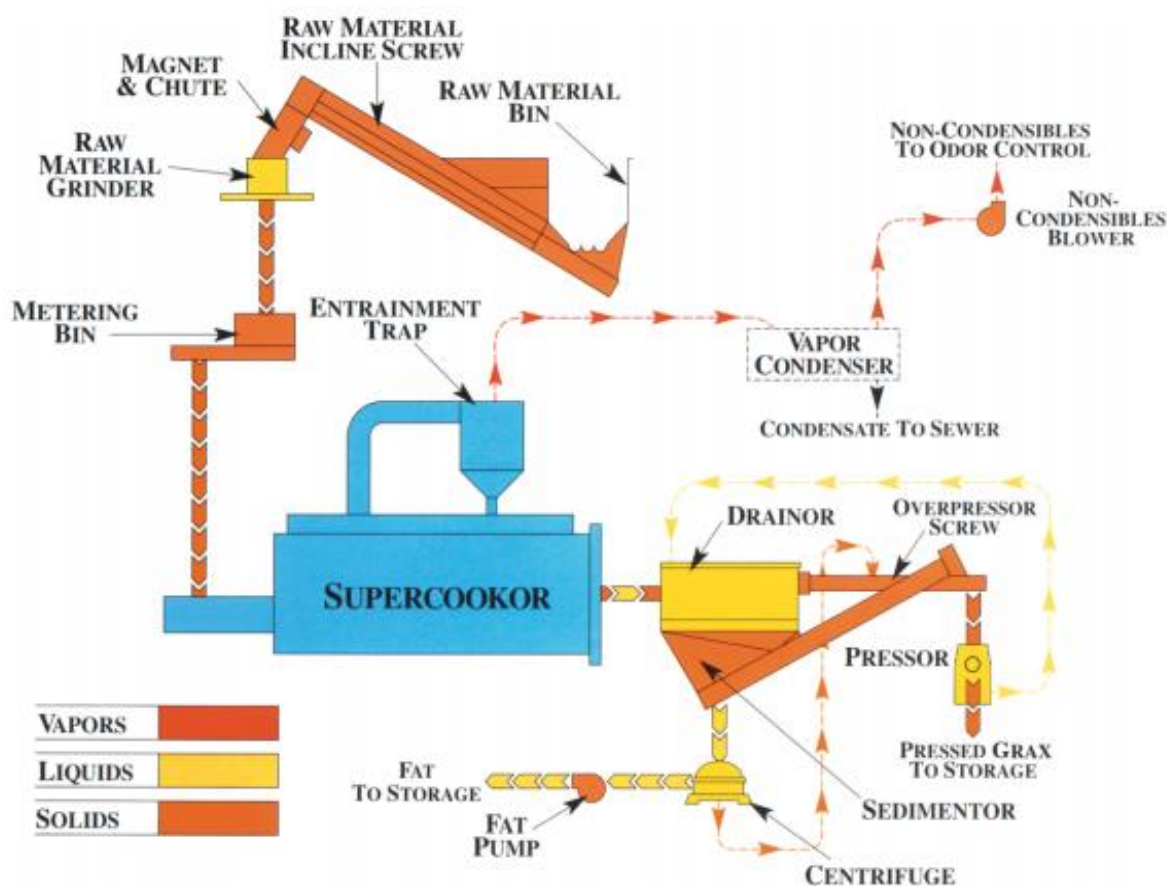


Figure 8: Process Flow

Raw materials:

Poultry waste/ byproduct i.e., fat, guts, feather.

Raw material availability in Pakistan:

Basic raw material i.e., poultry waste/ byproduct is abundantly available in Pakistan as chicken is the essential and mostly consumed meat food item in our daily life, a lot of waste is generated daily which will end up in landfills causing severe environmental impacts otherwise.

Emissions and controls:

Emissions from hybrid boiler i.e., CO, CO₂, SO_x, NO_x, PM etc.

For control of emission levels under NEQS permitted level, scrubbing system will be installed with the boiler stack i.e., wet scrubber & filter bag house. Particulate matter emitted only if fuel source is coal/ HFO otherwise boiler will be operating on natural gas on preference basis. Rendering process can also generate fumes/ VOCs i.e., ammonia, aldehyde etc., from condensate, for control weak acid and base showering is done to eliminate VOCs and to maintain pH of the wastewater. Afterburner can also be used as extra preventive measure.



Condensate (main wastewater source) is having relatively high TSS, BOD and nitrogenous compounds which can generate VOCs at temperature fluctuations will be treated through WWTP with chemical and biological treatment processes i.e., sedimentation, coagulation, chemical mixing (weak acid & strong base), aeration etc.,

Alternative Consideration:

Location alternatives: as the proposed project is the already owned industrial plot, also a few residential settlements 2.5-4 Km away from the proposed site location as shown in figures below. So, management of AAA Industry decided to establish an oil and protein processing unit as it is suitable location. Except this location proponent has also consider another location near Hassan Abdal town but it is rejected as it is agricultural land and adjacent to a populous village.

Modified Construction Technology Alternatives: The proposed development will be constructed using modern, locally and internationally accepted technology and materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy will be given first priority without compromising on cost or availability factors. The concrete pillars and walls will be made using locally sourced stones, cement, sand (washed and clean), metal bars and fittings that meet the quality standards requirements.

Technology Alternatives: There is local machinery available that is not environment friendly and also not brand new. But management of AAA Industry decided to import/ purchase locally available latest, energy efficient and environment friendly technology with adequate pollution control equipment and built-in safety features.

Reasons of selection of subject project site:

Following are the reasons of selection of subject project site:

- Availability of access road linked to Main GT Road.
- Communication facilities
- Availability of electricity
- Basic infrastructure
- Less plantation/ no tree cutting issue involved
- No fauna species at site
- Convenient plot layout
- Industrial activity already going on in the area
- No protected species in the area



Road Access:

Area is easily accessible by a link road to Main GT Road.

Land use at site:

Site proposed for the subject project is an empty plot free of any activity and it is the property of the AAA Industry. Below figure is showing the existing land use at the project site.

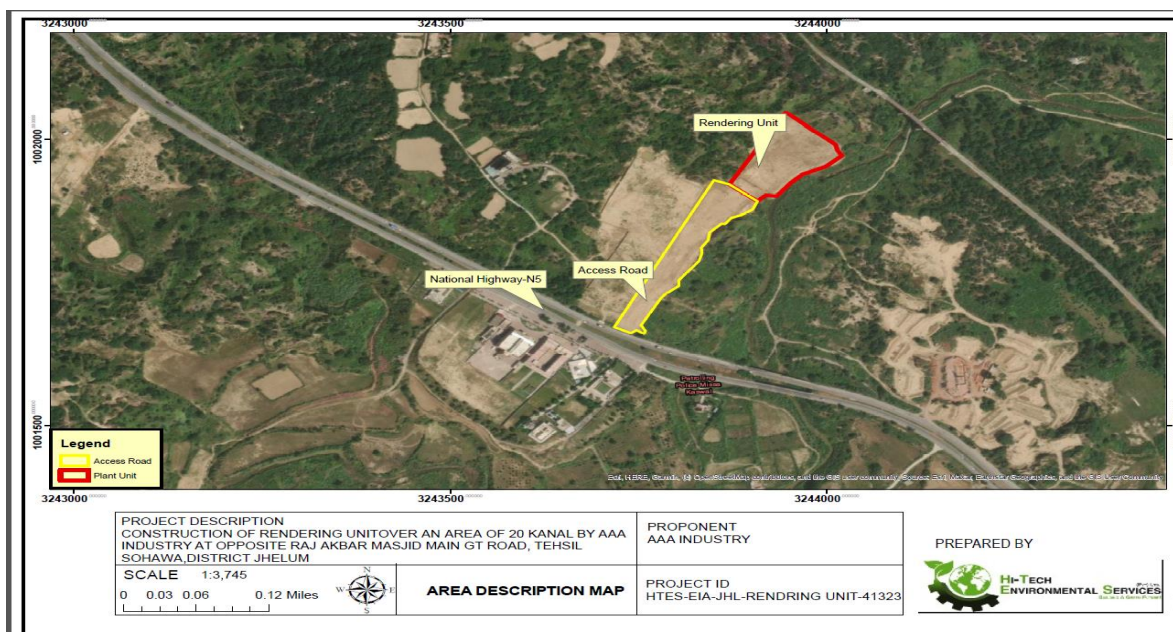


Figure 6: Land use on site

Vegetation features of the project:

The proposed study area is free from trees and vegetation/flora. Mainly grasses are present on few patches. So, no issue of trees cutting and clearing of vegetation involves but management of AAA Industry intends to restore the site area by planting native trees in possible systemic scientific way.

Cost and magnitude of the project:

Total estimated cost for proposed project is 210 million Pkr which includes cost of infrastructure, machinery installation etc.

Schedule of Implementation:

The project is land development, construction of boundary walls, offices and oil & protein manufacturing unit, which is expected to be completed within 1 year from the issued date of environmental approval.

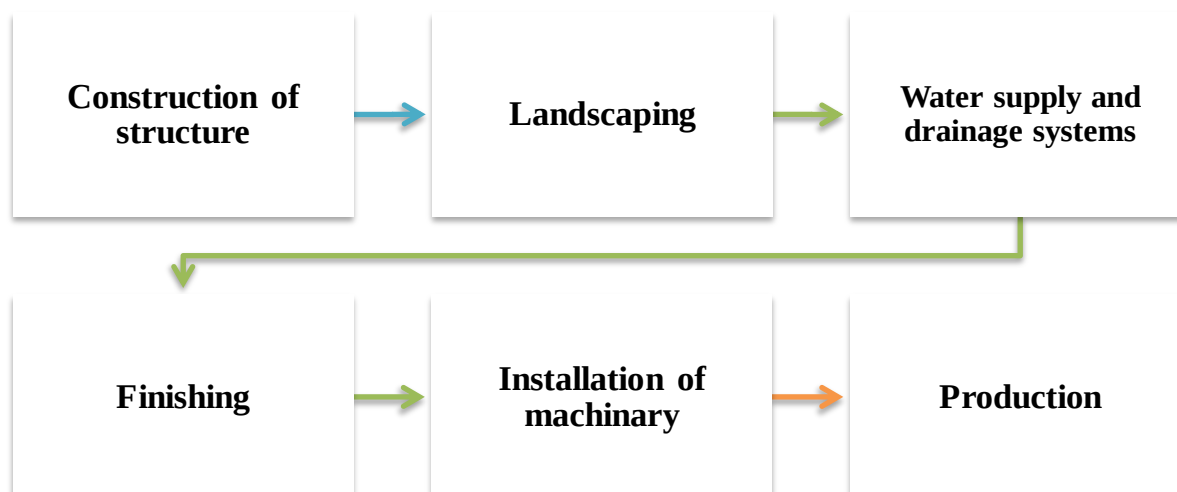


Figure 7: Schedule of implementation

Staff allocation:

Total number of labor force is:

During Construction/ Development	25-30 persons
During Operation	60-75 persons

Brief description of the project:

The subject project is the proposed construction of poultry rendering unit and will deals with Oil & Protein manufacturing with the help of poultry waste/ fats. Details of manufacturing process is thoroughly described in “Chapter No. 02 – Process Description” and Layout Plan is being attached with this report as **APPENDICES-IX** . Machinery requirement for whole process is including; hybrid boiler, cooker, centrifuge machine, sieve, hammer, conveyors. Basic raw material for the manufacturing of oil & protein is poultry waste/ fat. Raw material acquired from poultry shops, farms and slaughter house will be transported to subject proposed rendering unit via collection trucks and temporarily stored in closed poultry waste collection areas. This raw material will be fed into cookers through conveyor belts and steam will be provided from hybrid boiler. After cooking the material is transported into centrifuge machines which will extract oil and water content from the material, remaining material in centrifuge machines will be placed in hammer machine which will further extract the oil content of the material. Through this process two types of products i.e., poultry based oil & protein will be obtained. Production capacity of the proposed manufacturing unit will be 50 Ton per day.



Many industrial units are already working in the vicinity of the proposed site area. Before commencement of the subject project, it is necessary to obtain the NOC from concerned departments. So, EIA study has been carried out for the project prior to start activity in the area and to obtain the Environmental Approval from the Concerned Environment Department.

The subject project involves the construction of infrastructure, installation of machinery in area owned by proponent having very little vegetation presence. The proposed total area for the construction of the proposed unit is 12.4 Kanals. Total estimated project cost will be 210 million Pkr.

Name of the proposed project	AAA Industry
Purpose of the project	Development of industrial rendering unit for manufacturing of oil & protein for poultry meal. To produce industrial raw material for further processing/ manufacturing processes of poultry feed. To enhance economic growth of the country.
Process Details	
Manufacturing Process	Rendering of poultry waste
Raw Material	Poultry waste from poultry shops, farms and slaughters
Finished Products	Oil & Protein
Intermediate Products	Nil.
By Products	Wastewater, Air emissions
Capacity	50 Ton/ day
Land Requirement	
Total Area allocated for proposed project	20 Kanals
Covered areas of plot	• Waste material area (1): 14500 SFT. • Waste material area (2): 7500 SFT • Cooker hall: 3190 SFT • Hall: 5227 SFT • Admin block: 853 SFT • Septic tank/ WWTP: 108 SFT • Weigh scale: 1200 SFT • Operators block: 998 SFT • Parking: 1300 SFT
Status and location	



Location of the proposed site	Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum.
Description of project	In the process, poultry rendering unit will deal with Oil & Protein manufacturing with the help of poultry waste/fats. Machinery requirement for whole process is including; hybrid boiler, cooker, centrifuge machine, sieve, hammer, conveyors. Basic raw material for the manufacturing of oil & protein is poultry waste/ fat. Raw material acquired from poultry shops, farms and slaughter house will be transported to subject proposed rendering unit via collection trucks and temporarily stored in closed poultry waste collection areas. This raw material will be fed into cookers through conveyor belts and steam will be provided from hybrid boiler. After cooking the material is transported into centrifuge machines which will extract oil and water content from the material, remaining material in centrifuge machines will be placed in hammer machine which will further extract the oil content of the material. Through this process two types of products i.e., poultry-based oil & protein will be obtained.
Water Requirement	
Water consumption for the project	800-1000 Gallons/ day during construction phase. Approx. 15 m³/hr water will be required for rendering process i.e., for boiler & scrubbing system. Water will also be used for domestic purpose as per average daily consumption rate at workplace.
Ways of extraction	Motor pump
Source of Water consumption	Underground.
Amount of waste water	Wastewater will be generated from condenser, scrubbing system i.e., approx. 4-5 m³/hr. For domestic activities, 60-70% of used water.
Source of waste water	Constructional, Domestic and Process wastewater.
Mode of treatment	During land development site camp septic tanks will be installed for the treatment of domestic and constructional wastewater. During the operational phase of the project, WWTP will be constructed to treat wastewater from condenser and scrubbing system consist of chemical & biological



	treatment process i.e., sedimentation, coagulation, chemical injection/ spraying, aeration. septic tanks will be constructed for the treatment of wastewater from domestic consumption; It can be used for plants and sprinkling purposes or disposed off in nearby drain.
Solid Waste	
Source of solid waste generation	Construction and Domestic sources
Mode of disposal	Will be handed over to contractors
Solid waste during operation of unit	Domestic, Office waste
Manpower	
Labor Force	About 25-30 person during construction
Labor Force	About 60-75 person during operation
Power requirements	
Source of power	Power requirements at the project site will be fulfilled by WAPDA/ Industrial estate electricity supply/ standby power generator.

Safety trainings:

Workers and all the staff will be provided with proper training about the work and safety practices.

Personal Protective Equipment (PPEs):

Workers will be provided with PPEs as Masks, Gloves, Helmets, Safety shoes, Ear plugs, Ear muffs & other personal protective equipment during the working hours to insure personnel health & safety. Implementation of PPEs will be ensured by the proponent for the proposed project.

Risk Assessment and Disaster Management Plan:

Survey was conducted for the proposed subject project and according to the studies and local people of the area the subject area is not natural disaster prone i.e., flooding.

Occupational Exposure Mitigation Planning:

To control any occupational health and safety impact a detailed planning for mitigation measures has been done in the design stage of the project. Apart from the occupational exposure mitigation



plans for various activities and work areas of hazards i.e., firefighting arrangements, following existing administrative control measures will be extended to and followed. All employees will be trained for EHS policies and practices.

The management will develop environmental management plan to implement the mitigation measures further. The plan will include institutional measures such as occupational health & safety planning and environmental compliance monitoring for environmental parameters.

Use of Drugs and Narcotics:

Drugs and narcotics are strictly prohibited during working hours in working area. Smoking will be only allowed in rest timings at properly isolated places.

Security:

The site will be fenced properly especially during construction to avoid any unwanted entrance. Safety signs & boards should be placed at site during constructional and operational activity.

Power demand:

Operations electricity requirement will be fulfilled by WAPDA/ Power house generators (standby).

Water demand:

800-1000 Gallons/ day during construction phase.

Approx. 15 m³/hr water will be required for rendering process i.e., for boiler & scrubbing system.

Water will also be used for domestic purpose as per average daily consumption rate at workplace.

Government Approvals:

All relevant government approvals will be obtained by the project proponent and will be submitted to EPA at the time of operation.

Restoration & Rehabilitation Plan:

All possible precautions are taken to prevent an untoward incident in terms of life and property losses. The construction & demolition materials will possibly be reused and recycled. All excavated surfaces are termite proofed.

On completion of the project, the debris are removed from the site in order to maintain aesthetics of the project. All measures are undertaken for ensuring occupational safety, security and clean



environment in the project area. Ornamental trees and flower plants are planted on inside peripheral of the unit premises to restore the land.



CHAPTER - 3

DESCRIPTION OF ENVIRONMENT

This chapter describes the environmental, social and biological baseline conditions of the project area. The baseline conditions have been established on the basis of the data collected from the field, and through unstructured interaction with the local communities as well as the officials from various departments. In addition, the published data (secondary data) was also used to provide background information about the project area.

Physical Resources around the Project

There is not much diversity in the physical features of the district and the area appears to be monotonous.

Alluvial Deposits

Project site is located in District Jhelum, which is situated entirely on the alluvium plain. Kanker is found all over the district. Sediment deposits are visible in the low velocity area of the river where initial plant colonizers can be seen at the early serial stages of succession of vegetation. Along the banks of the river, gradual accumulation of sediments has resulted in “Bela” formation, which supports tree growth and hence named as “Zakeeras”.

Physiography

Jhelum district is part of Pothohar Plateau. The district stretches from the River Jhelum to the vicinity of River Indus. Jhelum district consists of salt range consisting of Mayo mines. There are two coal-mines in the district. From the north-western coal-mine railway obtains partial supply.

Soil Type

There is a long strip of very rich and virgin soil along the river which could be made a paradise of citrus plantation by drip irrigation if the local people are motivated. The types of soil commonly found are silt loam, loam, sandy loam, sandy clay loam and riverine silt. The immediate project area soil is riverine alluvial silt tending to fall in sandy loam and silt loam with Kankers.

Land Use

On an average, within the direct influence of the river and in the immediate vicinity of the project area, 20% of the land is under agriculture. About 0% is under settlements, 20 % wetlands and 0percent forest/range land.

About 80% of total population depends upon agriculture. Most of the agriculture land is under cultivation. Rice is the main Kharif (summer) crop. Wheat is the main Rabi (winter) crop while fodder is the other crop. The cropping intensity is over 100% and multi cropping is quite common.



Table 7 Land Use in Jhelum District

LAND USE	AREA (Ha)	% of Total Distt. Area
Total Geographical Area	750	100
Area Reported	359	47.86
Area Under Forest	45	6.0
Not Available for Cultivation	133	17.73
Culturable Waste	56	7.46
Current Fallow (C.F)	59	7.86
Net Sown (N.S)	66	8.80
Area Sown more than once (A.S.M.T.O)	32	4.26
Net Cultivated Area (C.F + N.S)	125	–
Net Cropped Area (N.S + A.S.M.T.O)	98	–

Climate

Jhelum has a humid subtropical climate (Köppen climate classification Cfa) and is extremely hot and humid in summer, and cold and generally dry in winter. The maximum recorded temperature in the pre-monsoon season of April to June is 49.2 °C (120.6 °F), whereas in winter the minimum temperature recorded is –0.6 °C (30.9 °F). Average annual rainfall is about 850 millimetres (33 inch). Nevertheless, in the rainy season water torrents flow from the north to Jhelum River very rapidly and cause damage to the crops, bridges and roads. This is responsible for the soil erosion in the district.

Table 8: Average Rainfall & Temperatures in District Jhelum

MONTHS	J	F	M	A	M	J	J	A	S	O	N	D	Avg.
Mean Rainfall	39	32	28	20	14	42	95	95	44	18	15	39	40.0
Max. Temp.	16	20	25	31	36	38	35	34	33	30	25	18	28.4
Min. Temp.	3	5	9	16	21	24	24	24	21	15	9	5	14.6

Water Resource in the Vicinity of Project Area

- Surface Water/Wetlands



Main source of surface water in the nearest vicinity of project area is River Jhelum itself. However, the surface water consists of several Nullahs (torrents) and discharge from Mangla Dam. These seasonal Nullahs on both sides of the river carry rainwater from the hills and other adjoining areas into the river during period of heavy rain. The surface water supply plays an important role in irrigation and drainage of the extended project area. Major source of irrigation water is River Jhelum. It is considered to be suitable for irrigation purposes. Discharge data is collected, from the guage installed at Jhelum Bridge on Lahore Islamabad G.T. road, during two months i.e. September and October of every year.

- **Ground Water**

The ground water aquifer is recharged by surface water. The sub-soil ground water table within the immediate project area is about 30-60 feet. The quality of the groundwater is such that it is suitable for domestic use. It is sweet and of drinkable quality. By and large, the tube wells are owned privately by people of the area.

Ecological Resources around the Project

Biodiversity

The natural vegetation found throughout the district is thorny.

- **Forest and Flora**

Vegetation of the Jhelum Forest Division is dry deciduous scrub type, Phulai, Kau and Sanatha are the main species. The stocking on the whole is poor and the forests are open. Vegetation is poor on sandstone and redmarl. The southern slopes are often devoid of vegetation while north western slopes carry good forests. The forests of Jhelum Divisions are burdened with right of grazing, browsing and firewood. Under settlement out of total area 93,566 acres (378.65 km²) only 5,468 acres (22.13 km²) about (45%) are right free. Remaining 55% are open to grazing. Some other species such as eucalyptus, sheesham, keekar and mulberry are also present.

Agricultural crops like wheat in Rabi season and rice and pulses in Kharif season are grown. The riverian as well as the inland flora plays a significant role in the local economy by way of timber and fuelwood production, protection from wind and water erosion, habitat of birds and animals, environmental balance, cultural identification and rehabilitation of soils affected by water logging and salinity

- **Fauna**

The fauna of the District is mostly indigenous, restricted (confined), like the vegetation, but similarly varied. The rugged and rough terrain, low rainfall, the scanty cover of vegetation and the increasing number of hunters, all have their share in limiting the fauna in the District. The riverine area offers a better environment than elsewhere though the hills support a more interesting wildlife. Uril and Chinckara are spot aids while wild bores are found in the Salt Range. Wolves, Foxes and Wild Cats are also found. Hare is fairly common. Chikor grey and black Partridge are also found in the parts of the district. Migratory ducks like Teal Pintail and



Mallard and some geese visit during winter. Fish such as Teal, Sohal, Silver Carp, Sanghara Rahu and Grass Carp have been reportedly found.

Socio-Economic Perspectives

Socio-economic aspects of the project area were studied on the basis of Focus Group Discussions and by exploiting the available secondary data. The results of surveys carried out have been drawn which are presented in the section below:

Jhelum City

The district headquarter of Jhelum is Jhelum City. This is situated on the right bank of Jhelum River. Grand Trunk Road constructed initially in 16th century passes through the city. Jhelum is the 35th largest city of Pakistan in terms of population. A cantonment was built during the British rule, which has grown up into a Garrison with an Infantry Division commanded by a Major General. In the past few years, the city has experienced rapid expansion and has become a vibrant economic and cultural center. The old city has narrow streets and crowded bazaars.

Jhelum District

Jhelum district locates in the Punjab province of Pakistan. It is located in the northern part of the province. Jhelum district is bordered by Sargodha to its south, Gujrat and the Jhelum River to its south and east, Chakwal to its west, Mirpur to its east and Rawalpindi to its north.

According to Punjab Development Statistics 2011, total population of Jhelum district is 1,148 thousand persons out of which 574 thousand are males and 574 thousand are female. Density of population in the district is 320 persons per square Kilometer. The district of Jhelum stretches from the river Jhelum to the vicinity of River Indus. Salt range exists in the district including Mayo mine from where salt is quarried. The prime centre of the salt trade is Pind Dadan Khan. Jhelum is known for providing a large number of soldiers to the British and later on to the Pakistan armed forces. That is why the district is also known as city of soldiers or land of martyrs and warriors. The district is crossed by the main line of the North-Western railway, and also traversed along the south by a branch railway line.

Major Castes in the District

The major castes of the district are Awan, Akra, Bharat, Gakhar, Gujar, Janjua Rajput, Jalap, Jat (Cheema, Dhamial, Gondal, Ghuman, Sipra, Nagyal, thathal, Kashmiris, Khokhars, Lilla Qureshi, Phaphra Mughal, Bhakral, Bhatti, Chib, Minhas, Narma and Sohlan.

Languages

Punjabi language is spoken by the majority of the population in the District Jhelum.



Minerals

Jhelum has very rich reserves of mineral resources. Minerals like Rock Salt, Brine, Gypsum, Coal, Bentonite and Silica Sand are being exploited commercially by private and public sector agencies in the district. Khewra Salt mine also located in district Jhelum.

Industry

There are numbers of industry in and around Jhelum City. Major industries include tobacco factory, wood, marble, glass, flour mills, cement and soda ash manufacturing units.

Major Profession

The major professions adopted by local people are service in Armed Forces. A large number of people of this district are settled in foreign countries particularly Western Europe. Agriculture and labour (workers on daily wages in construction, agricultural and other sectors) are also significant professions of the people living in Jhelum district.

Source of Drinking Water

Ground water is the main source of drinking water in the district. Households residing along the project area mostly have water supply in their houses for domestic use. Ground water is sweet and fit for drinking.

Literacy Level

Literacy is a basis for lifelong learning and plays a foundational role in the creation of sustainable, prosperous and peaceful societies. The Literacy ratio (10 years age and above) of Jhelum District was 63.9 % percent in 1998 on an overall basis. The literacy ratio for males calculated 77.66 % percent as against 50.47 % percent for females.

Impact on Land

During the impact assessment survey, data regarding the impacts of project was collected. However, the field investigations revealed that overall adverse impacts of the project on the local people, land, structure, crops, trees, business, and employment etc. are not significant.

Indigenous People

There are no indigenous people in the sub-project area. No notable migration of any tribe inside the area was observed for many decades. So, the project does not fall in the categorization of indigenous people.

Institutional

Institutional Activities

There are a number of governmental and non-governmental institutions in the project area.



Institutional Effectiveness

The institutions are yet in infancy stage. These are not fully effective.

Human Use

Telephone

Nationwide and international telephonic and fax linkages are available.

Livestock and Agriculture

The project area is famous for buffaloes known as one of highest milk producing animals. Livestock such as goats/sheep, camel and other cattle are also reared by the locals. The livestock includes cattle, buffaloes, sheep, goats, camels, horses, asses and mules. Nearly 25% of the farmer's income is from livestock. At least 10% of the population is landless, cattle raisers and their living come from cattle milk marketing. On the average each family possesses 5-6 cattle and 7-10 sheep and goats.

Jhelum District has a total area of 858,767 acres, out of which 316,815 acres are cultivated. Agriculture in the District Jhelum depends mainly on rainfall. The average rainfall of the area varies from 20 to 40 inches. The irrigated area at present is limited but the emphasis on construction of small Dams and Mini Dams is gradually increasing. Besides, Wheat, Sugarcane, Rice, Moong, Mash, Masoor, Gram, Ground Nut, Jawar, Oil Seed Such as Rape/Mustard and Sun Flower are grown in the district. About 80% of the population of project area depends upon agriculture. Most of the area is well cultivated. Rice is the main Kharif crop.

Cultural Heritage

The area does not boast of any significant cultural development. People follow the family/village traditions.

Archaeological Monuments / Relics

No sites of archeological, historical, cultural or religious significance are known to exist in the areas where construction will take place or where different project facilities will be established / located. In case, if any such site is found during the subsequent phases of project, it can be handled as per Law and Procedures.

Ambient Quality of Environment

Ambient Air Quality

Field visit observations indicate that ambient air quality is generally acceptable. There will be mechanical equipment to be used in the mining works which may generate gaseous emissions. However, it is anticipated that these emissions will not be a threat to the environment in the project area since it can be managed through proper implementation of Environmental



Management Plan. It is also anticipated that Carbon Monoxide and Oxides of Sulphur and Nitrogen derived from powered vehicles can also be managed through proper implementation of environmental Management Plan.

Noise Level

Field visit observations indicate that ambient noise levels are within permissible limits as there is neither any mobility of vehicles nor industrial units exist in the project area. It is anticipated that powered mechanical equipment and vehicle to be used during construction period can generate noise of moderate level. This can be minimized through proper implementation of Environmental Management Plan.

Natural History Event/Seismic Hazards

The area has no history of any serious damages due to earthquake. The area lies in Zone 2B which is a Minor Hazard Region.

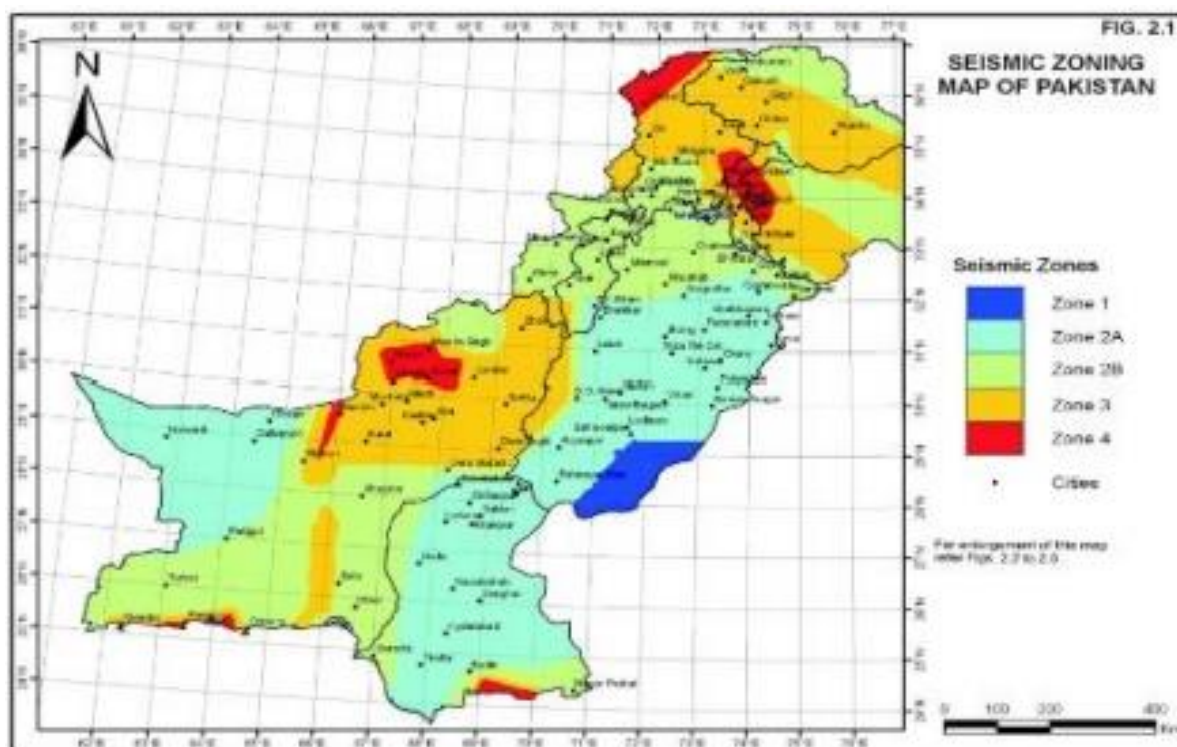


Figure 11 Seismic Hazard Zones of Pakistan

Lab Reports of Environmental Analysis

To assess the baseline conditions of the project area, following environmental components were monitored:

- Ambient air quality
- Water quality
- Noise levels



Suitability of the Site

The site does not fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not have impacted by the construction activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of proposed project.

Archaeological and historical treasures

Proposed project is free from any type of historical and archaeological site/building.



CHAPTER - 4

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES

Assessing impacts:

The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of constructional & operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level. The anticipated impacts related to project location, design, construction and operational phases have been assessed and mitigation measures are provided accordingly.

Environmental impacts due to project location:

Site for the subject project is located at Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum. Very scarce vegetation and no nearby water channel in the surroundings of the project site and no adjacent human settlement near the project site. Site does not fall in the category of sensitive area and no environmentally sensitive localities exist within radius of study area.

If the mitigation measures are effectively implemented, the residual impact of the subject project activities on the area's geophysical environment is expected to be insignificant.

Mitigation Measures for location phase impacts:

- Project site should have good road infrastructure with in project site for transportation by heavy machinery and efficient road infrastructure already exists there that is used currently to access the site.
- The project will provide the jobs to the local residents as well as to those from the suburban areas.
- Rehabilitation and plantation will be done to reduce long term serious effects.
- Safe drinking water, Heat stroke center and shelters will be providing to workers in summer.
- Proper parking area and traffic should be regulated to ensure better traffic conditions in the area.

Environmental Impacts due to the project design:

Following could be the impacts related to the design of the project:

- If structural stability of the buildings built with in project site will not be ensured, it may be a negative impact related to the design of the project.



- Inappropriate soil structure and soil bearing capacity may also be a negative impact related to the design of the project.
- Poor road infrastructure design may lead to particulate matter issue at the project site and nearby region due to soil erosion.
- Unavailability of emergency services within the project site may cause life loss in case of emergency because site area has no nearby health facilities.
- Electricity hazards may arise due to improper electrical works.
- Raw material storage areas should be properly covered, cool & well-ventilated.

Mitigation measures and recommendations:

Following are the mitigation measures and recommendations to minimize the anticipated impacts related to the design of the project:

- Structural stability of the building should be ensured.
- Ample parking and good road infrastructure should be ensured at the project site.
- Emergency Services should be ensured within the project site i.e., firefighting arrangements.
- Geo-technical investigation of the project site should be conducted.
- Electricity system should be designed safe and sound.
- Electricity wires should be covered by thick plastic/electricity resistant covers.
- Appropriate waste water treatment system design should be ensured at the project site.
- Safety alarm and signaling system should be installed.
- Emergency exit plan should be formulated and communicated to each staff member.
- Storage halls should have adequate cooling system to maintain the low temperature to prevent rapid decomposition of poultry waste.

Environmental Impacts during the construction phase:

Air quality:

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. The critical sources of dust pollution during the construction phase will be

- Unpaved road surface
- Transportation of materials and other construction activities that create dust emissions



- Excavation activities during construction
- On field generators (if any)

Mitigation:

- Sprinkling of water on track will reduce dust pollution
- Provision of dust masks for workers.
- Air quality monitoring is recommended on regular basis
- Proper paved road infrastructure is recommended for transportation of material.
- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions
- Blowing of dust and particulate matter from stockpiled loose materials (e.g. sand, soil) should be avoided either by sheeting them with tarpaulin or plastic sheets or by sprinkling them with light shower of water
- Open burning of solid waste from the contractor's should be strictly banned

Noise:

Noise is a by-product of human activity, and area of exposure increases as function of mobility and construction activities. Sources of noise during construction are heavy machinery such as bulldozers, excavators, stabilizers and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors located within 50 meters of the proposed Project.

Impact:

- Persistently higher noise levels can produce psychological effects of distraction of attention, irritation and short temperedness in the exposed persons
- Noisy settings and higher background levels can cause temporary threshold shift and the consequent habit of speaking loudly, which may cause damage to vocal cords in the persons exposed
- Noise produced from moving construction vehicles and blowing of pressure horns, at times, could be intolerable particularly during quiet hours of night.

Mitigation:

- Selection of up-to-date and well-maintained plant or equipment with reduced noise levels ensured by suitable in-built damping techniques or appropriate muffling devices



- Confining excessively noisy work to normal working hours in the day, as far as possible
- Providing the construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use
- Preferably, restricting construction vehicles movement during night time
- Vehicles and equipment used should be fitted, as applicable, with silencers and properly maintained
- Use of low noise machinery, or machinery with noise shielding and absorption
- Contractors should comply with submitted work schedule, keeping noisy operations away from sensitive points; implement regular maintenance and repairs; and employ strict implementation of operation procedures.

Soil:

The project area is open land with no paved area. Soil erosion and contamination may occur on site due to the following likely impacts:

Impact:

- Excavation of earth/cutting operations
- Land leveling activities
- If the excavated area is left unfilled for long, which may lead to rainfall induced soil erosion;
- The unspent materials and debris produced from consumed up materials, if left as such and allowed to mix with soil underneath, can degrade the quality of receiving soils and may render them unfit for plantation later on.
- Leakages of oils, lubricants, chemicals, and other similar substances from their storage sites and from engines of the generators, machines, equipment and vehicles can spoil the receiving soils and may undermine ability of the spoiled soils to support growth of vegetation and plants as proposed site is already has scarce vegetation
- Non-provision of septic tanks with the temporary worksite toilets, constructed for the labor and others, can contaminate the effluent receiving soils because of raw nature of the effluents

Mitigation:

- Non-bituminous wastes from construction activities will be dumped and covered properly



- As applicable and needed, plantation of grasses and shrubs will be done at appropriate place where required
- Unnecessary excavations should be avoided
- Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire.
- Septic tanks of adequate capacities should be constructed for receiving and treating wastewater from all temporary worksite toilets and at the temporary container offices, if any. The toilet wastewater should not be discharged untreated onto the adjacent lands
- All machineries and materials should be stored at the designated areas and compounds
- All the unspent and left over materials should be completely removed offsite upon completion of construction

Wastewater:

Impact:

- Wastewater generation due to construction activities

Mitigation:

- Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be used to sprinkle over ground.
- Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream.
- An appropriately designed septic tank will be used to treat sewage/waste water to achieve Compliance of NEQS.
- Periodic cleaning of the septic tank is recommended.

Solid waste:

Due to construction activities waste will be generated at construction and camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and solid waste etc. The handling and storage of oil, asphalt/bitumen may be a source of



environmental pollution as a hazardous waste. This will result in unhygienic conditions, health risk to work force and public at the camp site.

Impact:

- Insecure and unhygienic disposal of the solid wastes generated at the worksite, particularly garbage and trash may cause degradation of soil and land.
- Insecurely disposed off heaps of wastes containing kitchen garbage and food waste can serve as breeding grounds for the disease spreading vectors and rodents

Mitigation:

- An efficient and responsive solid waste management system should be devised for the entire duration of the construction phase. Such a system should provide for separate collection of different categories of constructional wastes. The wastes which will be reusable/recyclable (iron bars, aluminum) should be sold to waste vendors or utilize with in site and those which cannot be sold out (brick pieces) may be used as a filling material for leveling the depressions, subject to technical feasibility.
- Training of working force in the storage and handling of materials and chemicals that can potentially cause soil contamination
- Solid waste generated during construction and camp sites will be safely disposed in waste disposal sites allocated and covered efficiently.

Health and safety:

Health risks and work safety problems may result at the workplace if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction material. Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in project area. Mitigation measures will include:

Mitigation:

- Providing basic medical training to specified work staff and basic medical service and supplies to workers
- Layout plan for site, indicating safety measures taken by the contractor, e.g. Firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents



- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction
- Provision of protective clothing for laborers handling hazardous materials, e.g. Helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc.
- Ensure strict use of wearing these protective clothing during work activities
- Instruct foremen to strictly enforce the keeping out of non-working persons, particularly children, off work sites
- Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.

Impact on biological environment:

There is no any fauna or flora is present on the proposed project site. Patches of grasses and shrubs are there. Plantation of native species is recommended as rehabilitation step.

Impact on socio-economic environment:

Economic activity:

Due to the construction of the proposed project, economic activity will be generated in the project area as the laborers and semi-skilled staff will have an opportunity to work for the construction of the proposed project. This will help in developing their skills and capacities. This is a moderate positive impact.

Lifestyle and culture:

There are chances of arising of issues related to cultural differences/conflict between the contractor's workforce and the local inhabitants, conflicts arising due to the mix of local and migratory job seekers as the use of local resources and products will be increased. In this situation, local residents may resist contractor's workforce attitudes, cultural clashes particularly when local/international contractors are engaged, social disturbance and dissatisfaction with employing outsiders may arise. This impact is temporary and minor negative in nature.



Potential Impacts during operational phase:

Methodology for impact evaluation:

The methodology adopted for impact evaluation includes the Modified Leopold Matrix.

The analysis is performed with the Leopold Matrix (LM). This matrix has:

1. On the horizontal axis, the actions which cause environmental impact, and
2. On the vertical axis, the existing environmental conditions which may be affected by those actions.

This provides a format for comprehensive review of the interactions between proposed actions and environmental factors.

The most important blocks marked are evaluated individually, and a number between 0 and 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact (0 represents the least magnitude, and 10 the greatest). Likewise, a number between 0 and 10 is placed in the lower right-hand corner to indicate the relative importance of the impact (again, 0 represents the least magnitude and 10 the greatest).

Table 9: Scale for impact assessment (Significance & Magnitude)

Sr. No.	Type of Impact	Scale of Magnitude (0 – 10)	Scale of Importance (0 – 10)
1	No Impact	0	0
2	Low Impact	1 – 4	1 – 4
3	Medium Impact	5 – 6	5 – 6
4	High Impact	7– 10	7– 10

Over all the impact of project is positive in term of employment and infrastructure improvement. Mostly the average values are falling in 1.5 – 3 range which means the overall impact is low e.g., biodiversity, wastewater generation, occupational hazards but for Air quality and water consumption score is high if mitigation measures will not adopt. To counter with the negative impacts Environmental Management Plan is formulated which will be ensured by the project proponent. Beside this environmental monitoring plan is also formulated for environmental monitoring of various parameters which will be also implemented by the proponent.

Impact analysis and prediction:

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys, consultation with the community and their active



participation plays a vital role in successful implementation of the project. For the impact analysis and predictions following methods were adopted:

Consultations/ case studies:

To study the impacts of the project on physical and biological environment, site visits were conducted by the environmental practitioners and experts and possible physical and biological impacts which may arise due to the subject project were identified through consultations and case studies and their mitigation measures were suggested accordingly.

Meetings:

For the identification of the social impacts of the project, meetings and group discussions were held with the local people, stakeholders, nearby residents and passerby because social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long term viability and enhances its benefits to locally affected people and other stakeholders.

Impact assessment criteria:

The impacts were assessed in the light of criteria given as under:

- Magnitude or degree of impact
- Time and duration of impact
- Likelihood of impact occurrence
- Sensitivity of impact
- Risk related to impact

Air Quality:

Emissions can be produced by boiler, cooker, generators (if any) & vehicles in terms of the resulting pollutants (CO₂, CO, SO_x, Hydrocarbons, PM, VOCs etc.)

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: irreversible

Likelihood: moderate if mitigation measures are being ensured.



Consequences: moderate, if pollutants level in the ambient air is being controlled within acceptable limits by adopting proper mitigations.

Impact significance: high, if pollution control measures not taken, minor to moderate if fully adopted.

Mitigation Measures:

- Industry should ensure the NEQS compliance and should not be allowed to emit hazardous pollutants.
- Air Emission Control Measures are recommended to control the air emissions. i.e., scrubbing system, condenser etc.
- A machinery maintenance plan should be developed and implemented.
- Cooker operation can produce VOCs i.e., ammonia, aldehyde, hydrogen sulfide which will be eliminated from exhaust gas composition by installing condenser system with scrubber.
- Maximum possible plantation is recommended as it absorbs gaseous emissions as well as prevent lower atmospheric dust to move along with the air action.
- All project related machinery, standby generators, vehicles will be checked regularly to ensure that are in sound working condition and are not emitting smoke.
- Regular monitoring as per NEQS is recommended for ambient air and stack emissions.
- Proponent should keep the records of monitoring and equipment maintenance.

Water:

Wastewater will be produced from condenser system and domestic activities in operation phase, process wastewater can have high TSS, BOD, nitrogenous compounds.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: Not applicable

Likelihood: low if mitigation measures are being ensured.

Consequences: minor, if pollutants level in the wastewater is being controlled within acceptable limits by adopting proper mitigations.

Impact significance: low, based upon low likelihood and if measures are adopted.



Mitigation measure:

- Industry should construct treatment facility to treat its wastewater before its final disposal.
- WWTP should be developed consist chemical & biological treatment processes i.e., sedimentation, coagulation, chemical mixing (weak acid & strong base) to eliminate nitrogenous compounds, aeration tank etc.,
- Wastewater generated from domestic activities, septic tanks will be constructed to treat it before disposal/ reuse.
- Treated wastewater will be used for plantation or can be used for sprinkling purpose on unpaved areas or simply drained out in nearby local drain.
- Compliance of NEQS for Effluents should be ensured.
- Monitoring should be conducted as per NEQS and record should be maintained.
- For cooling system requirement, the system should be developed in close loop in order to conserve large water requirement.

Noise:

Noise is a by-product of human activity, and area of exposure increases as function of mobility and operational activities. Noise is the major concern during the operation phase. It can be generated from the the machinery used for operations i.e., loading and unloading of material, generators (if any), project vehicles etc.

Nature of impact: Direct

Duration: long term

Timing: operation

Reversibility: Not applicable

Likelihood: low

Consequences: slightly significant

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels:

- Activities generating high levels of noise should be minimized at the project site.
- Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating



equipment will be provided to the workers and other staff in case of noise at the project site.

- Sound proof/ covered buildings should be built for placement of machinery i.e., generators (if any) to be installed at the project site to control the noise.
- Proper tuning of machinery is recommended.
- Rubber wounds/ vibration control platforms should be placed underneath the machinery/ generator to avoid the vibration.
- Speed/ horn restriction should be imposed on all project related vehicles.
- Maximum plantation is recommended within site area as it absorbs the noise waves and act as barrier.
- Regular monitoring as per NEQS/ OSHA standards and record keeping is recommended.

Solid waste:

In the operation of said project proper solid waste management system is being adopted for the prompt, timely and efficient disposal of solid waste for the reduction of its impacts. Impacts due to solid waste may be temporary and minor in nature.

Nature of impact: Direct

Duration: Short term

Timing: operation

Reversibility: Not applicable

Likelihood: Low (unlikely) if mitigation measures are being ensured that Solid waste management in efficient way.

Consequences: Mild, as it is being removed from site within few hours

Impact significance: Low, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Devise plan & develop guidelines for the safe handling, storage & disposal;
- PPEs are strongly recommended for workers for the handling of hazardous waste (if any);
- Separate bins at various places must be present for solid waste collection and segregation;
- Waste is being handed over to local waste contractor;
- Solid waste should undergo recycling and reuse at maximum level;
- Industrial ecology practices are being implemented wherever possible;
- 3R's of sustainability is recommended;



Energy:

Energy consumption in industrial area is usually very high. Machinery work runs all day in different industries. Energy conservation technique should be in mind.

Mitigation measures

- Do not waste the energy/ electricity when there is no need of it.
- Use energy efficient machinery and equipment
- Waste heat recovery system is recommended for generation of electricity and conservation of fuel/ energy.
- Use energy saving products
- Conduct and maintain records for energy audits
- Do not leave the machinery in running form when there is no working being done
- Machinery must never be left unattended.
- With time, industrial operations should be upgraded based on renewable energy sources.

Health and safety:

Health risks and work safety problems may result at the workplace if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous material. Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in project area. Mitigation measures will include:

Mitigation:

- An HSE department should be established to look after the worker and community's health, safety & environment related issues, headed by HSE officer.
- Proper training of workers and staff should be conducted to avoid the accidents.
- Use of PPEs should be implemented at workplace.
- First aid measures/ medical facility should be provided at the project site.
- Safe drinking water must be provided to workers and staff.
- Safety signs & boards should be placed during operational activities.
- Smoking or any drugs should be prohibited during working hours or performing work.
- Fire Fighting Arrangements/ Equipment should be installed and responsibility should be assigned for firefighting in emergency situation.



- SOPs for operational activities should be formulated and implemented.
- Regular review meetings should be arranged to assess the efficacy of EMP.

Soil Contamination:

leaching from storage sites, Oil and chemical spills can contaminate the soil.

Mitigation measures:

- Raw material should be stored in properly constructed covered paved area to prevent leaching of contaminants in soil. i.e., in rainy seasons.
- Provision of spill prevention and control kits.
- Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.

Impact on socio-economic environment:

Due to the proposed project, economic activity will be generated in the project area as the laborers and semi-skilled staff will have an opportunity to work for the proposed project. This will provide them an employment opportunity close to their homes. This is a positive impact.

Potential environmental enhancement measures:

Following necessary measures should be adopted during operational phase of the project and most of them are being adopted:

- Sprinkling of water should done on dusty roads and tracks.
- Machinery should never be left unattended.
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading should be allowed in any case.
- Machinery should be kept maintained.
- Wastewater will be treated through WWTP/ septic tanks that will be installed within the premises of the subject project.
- Proper SOPs will be followed with proper schedule along with the HSE conditions.
- A proper tree plantation plan is formulated to save the environment.
- Solid waste will be handled properly.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.



- Hygienic conditions should be ensured and proper quality will be maintained by management.
- First aid facilities should have been made available.

Purpose of Mitigation measures:

What is the problem i.e. In terms of “major environmental impacts” which may arise by the subject project activity?

The major impacts which may arise by the subject project are air and noise pollution. Other impacts are of minor importance. These impacts may arise during operational phase of the project, during the operational phase of the subject project, it will be ensured that precautionary measures are being adopted, during the activity and post activity to cause minimum impacts to the environment.

When the problem will occur and when it should be addressed?

Negative impacts may arise during the operational phase of the project if proper precautionary measures and procedures are not being followed. If proper precautionary measures and procedures are being implemented, there should not be any major problem. If any impact would arise due to the subject project activity, it will be addressed on site. Trainings is being conducted on site while other precautionary measures will also be adopted to make the project safe and environment friendly.

Where and how the problem should be addressed?

The problem should be address at the site and immediate response should be provided to address the problem which may arise. Institutional capacity responsible for the implementation of EMMP is responsible for addressing such problems if arise.



CHAPTER - 5

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

The primary objectives of the EMMP are to:

- 1) Facilitate the implementation of the mitigation measures identified in the EIA.
- 2) Define the responsibilities of the project proponent.
- 3) Define a monitoring mechanism and identify monitoring parameters in order to:
- 4) Ensure the complete implementation of all mitigation measures.
- 5) Ensure the effectiveness of the mitigation measures.
- 6) Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- 7) Identify training requirements at various levels

Institutional capacity:

The overall responsibility for compliance with the environmental management plan rests with the project proponent. He will appoint a HSE/ Project manager of relevant qualification. HSE/ Project manager is acting as Environmental Manager and is managing all HSE conditions according to the NEQS.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE Officer/ project manager
- In-Charge Administration
- Supervisor of project

Training Schedule:

Training for the management and workers on environmental aspects of the project is being arranged during the operational phase of the project.



Table 10: Proposed training schedule

Sr. No.	Description of program	Labor/ Personnel involved	Time/ duration
1)	General HSE Training	Trainers and whole labor	Quarterly for 1 hour
2)	Instrument use/ workplace specific items	Trainers and whole labor	Quarterly for 1 hour
3)	PPEs use and safe work practices at work site.	Trainers and whole labor	Quarterly for 1 hour
4)	Reporting and investigating accidents/ incidents	Trainers and whole labor	Quarterly for 1 hour
5)	Emergency procedures	Trainers and whole labor	Quarterly for 1 hour
6)	Medical and first aid	Trainers and whole labor	Quarterly for 1 hour
7)	Health and safety promotion	Trainers and whole labor	Quarterly for 1 hour

In order to raise the level of professional and managerial staff, there is a need to upgrade their knowledge in the related areas. HSE/Project Manager should play a key role in this respect and arrange the training programs. HSE/Project Manager will provide training to staff and workers about the best environmental management practices. The training modules will include air, noise and water pollution monitoring, social awareness, Environmental Laws, National Environmental Quality Standards (NEQS), Usage of personal protection equipment, and health and safety related issues on the project site.

The HSE/Project Manager will train all workers & staff in basic sanitation and health care issues (e.g., how to avoid malaria and transmission of Sexually Transmitted Infections (STI) HIV/AIDS and in general health and safety matters, and on the specific hazards of their work. Training should also consist of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation.



Summary of impacts and their mitigation measures:

Table 7: Summary of impacts during construction phase

SUMMARY OF IMPACTS DURING CONSTRUCTION PHASE		
Potential Impacts	Criteria for determining Significance	Key Mitigation Measures
Gaseous/ PM Emissions— Dust/ PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site.	An increase in visible dust beyond the boundaries of the construction site; or Concentration of PM ₁₀ in excess of 150 µg/m ³ NEQS for Ambient Air	Sprinkling of water on dusty roads, tracts and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Use of wind shield around stockpiles is recommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks; Face masks should be strictly implemented for labor working on the project.
Construction Noise— Noise may be generated during landscaping activities and from generators and transportation vehicles at the project site; which may be a nuisance for the workers.	OSHA standards	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the site generator to avoid the vibration. • Site generator should be placed in canopy/ room to minimize noise spread.
Solid waste Management— If solid waste will not be managed properly, it may cause negative impacts	Generation of excessive waste; Recyclable waste and reusable waste is discarded; Improper disposal	Constructional waste should be utilized for land filling and maintenance purposes; Domestic waste should be disposed off properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.



		Temporary handling & storage site should be designated.
Vegetation Loss/ Soil erosion — Minor negative impact may arise as only some weeds and grasses are present at the project site which will be cleared for the purpose of construction.	Unnecessary or excessive removal of trees and shrubs.	No tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation and trees. Preparation of a Reinstatement/ Plantation Plan to restore the land after the constructional activities is recommended. Native trees/ plants will be planted along with boundary walls and in designated sites.
Soil Contamination —Oil and chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Wastewater- generated from constructional & domestic activities.	Environmental implications if disposed off untreated. Prevention of diseases spread.	Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be used to sprinkle over ground. Waste segregation measures will be employed to minimize entry of solid waste into the wastewater stream. An appropriately designed septic tank will be used to treat sewage/waste water to achieve Compliance of NEQS. Periodic cleaning of the septic tank is recommended
Socioeconomic impacts—Inter-cultural differences between the project staff from other areas and the local community may arise due to the subject project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and	No community complaints Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people to maximum extent possible.



economic growth.		
Health and safety issues- may arise due to improper handling of work and if precautionary measures will not be adopted.	OSHA Standards	Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/medical facility should be provided at the project site. Safe drinking water must be provided to workers and staff. Safety signs & boards should be placed during constructional activities. Construction site should be fenced properly to avoid any damage to nearby settlements. Smoking or any drugs should be prohibited during working hours or performing work. At the time of earthwork, fencing will be ensured for the area under the exploration.

Table 8: Summary of impacts during operation phase

SUMMARY OF IMPACTS DURING OPERATION PHASE		
Potential Impacts	Criteria for determining Significance	Key Mitigation Measures
Air Emissions- During the operational phase of the project, gaseous emissions from project related activities and power sources may affect the air quality of the project area. Project activities i.e., cooking of poultry waste can also impact the ambient air through VOCs. Air emissions i.e., CO, CO₂, SO_x, NO_x	NEQS for Ambient Air NEQS for Stack Emissions	Industry should ensure the NEQS compliance and should not be allowed to emit hazardous pollutants. Boiler should be operated on natural gas which has low emission potential as compared to other fuel sources. Air Emission Control Measures are recommended to control the air emissions from hybrid boiler i.e., Cyclone, Scrubbers. Air Emission Control Measures are recommended to control the air emissions from condensate (VOCs) i.e., Condenser with scrubbing system to eliminate fumes. Raw materials should be kept in covered cool, well-ventilated area to prevent foul smell due to decomposition products.



from boiler.		Raw material should be utilized as early as possible & not be kept in waste storage halls more than a day. Regular cleaning and hygiene of waste storage halls should be ensured. Maximum possible plantation is recommended as it absorbs gaseous emissions as well as prevent lower atmospheric dust to move along with the air action. All project related machinery, standby generators, boiler will be checked regularly to ensure that are in sound working condition and are not emitting smoke. Regular monitoring as per NEQS is recommended for ambient air and stack emissions. Proponent should keep the records of monitoring and equipment maintenance.
Noise- Noise due to industrial activity, machinery and generators can be a nuisance for the workers in the working area.	NEQS for ambient noise level. OSHA standards for covered working areas.	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff in case of noise at the project site. • Sound proof/ covered buildings should be built for placement of machinery i.e., generators (if any) to be installed at the project site to control the noise. • Proper tuning of machinery is recommended. • Rubber wounds/ vibration control platforms should be placed underneath the machinery/ generator to avoid the vibration. • Maximum plantation is recommended within site area as it absorbs the noise waves and act as barrier. • Regular monitoring as per NEQS/ OSHA standards and record keeping is recommended.



Discharge of wastewater- The discharge of untreated industrial effluents or municipal wastewater may be a negative impact of the subject project.	NEQS for Municipal and Liquid Industrial Effluents (mg/l, unless otherwise defined)	Industry should construct treatment facility to treat its wastewater before its final disposal. Rendering plant can generate more than one source of wastewater streams i.e., Condensate & washing activities, this process wastewater needs to be treated through chemical & biological treatment processes i.e., coagulation, sedimentation, chemical spraying/ injection, aeration etc. as it can contain TSS, BOD, Nitrogenous compounds i.e., ammonia. Wastewater generated from domestic activities, septic tanks will be constructed to treat it before disposal/ reuse. Treated wastewater will be used for plantation or can be used for sprinkling purpose on unpaved areas or simply drained out in nearby local drain present along with the northern boundary of the proposed site. Compliance of NEQS for Effluents should be ensured. Monitoring should be conducted as per NEQS and record should be maintained.
Health & Safety Issues- different operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.	OSHA Standards	An HSE department should be established to look after the worker and community's health, safety & environment related issues, headed by HSE officer. Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/ medical facility should be provided at the project site. Safe drinking water must be provided to workers and staff. Safety signs & boards should be placed during operational activities. Smoking or any drugs should be prohibited during working hours or performing work. Fire Fighting Arrangements/ Equipment should be installed and responsibility should be assigned for firefighting in emergency situation.



		SOPs for operational activities should be formulated and implemented. Keep the workplace especially storage halls clean and hygienic to avoid foul smell and spread of diseases due to decomposition of waste & raw material should be placed in covered cool & well-ventilated halls. Regular review meetings should be arranged to assess the efficacy of EMP.
Soil Contamination— leaching from storage sites, Oil and chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil.	Raw material i.e., poultry waste should be stored in properly constructed covered paved area to prevent leaching of contaminants in soil. i.e., in rainy seasons. Oil produces from the rendering process should be stored in safe storage and regular inspection & monitoring of the storage site should be done. Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated if hydrocarbon-based spillage occur.
Solid waste management- If solid waste will not be managed properly, it may cause negative impacts.	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	Solid waste from the domestic sources should be disposed off properly by following SOPs onto designated sites. Proper solid waste management system is recommended for unit. Separate waste bins should be placed at suitable places. Ensure regular cleaning and collection of solid waste from waste bins and halls and should be transported to designated solid waste management/ collection site. 3R's of sustainability are recommended to achieve.
Biodiversity- untreated wastewater disposal can impact the downstream biodiversity as it can impact the dissolved	High BOD level of wastewater; Reduction in DO of water;	Proper wastewater treatment plant is recommended having chemical and biological treatment system to tackle TSS, BOD, COD. Regular monitoring of wastewater as per NEQs is recommended.



oxygen of the downstream water body.	pH fluctuations;	
Odor- condensate from the water can cause foul smell as it contains VOCs. Unhygienic and delayed storage of raw material can cause severe odor.	Unhygienic work/storage practices. Storage of raw material more than a day. Poor ventilation and high temperature of storage halls.	To reduce odor from the condensate ammonia stripping and scrubbing with cool water is recommended. Storage halls should be regularly wash and wastewater should be treated in WWTP. Proper hygienic conditions should be maintained at site. Storage halls should be constructed in a way to ensure adequate ventilation and maintain low temperature inside. Raw material should not be kept for days as decomposition can initiate in 24-48 hours.
Socioeconomic impacts —Inter-cultural differences between the project staff from other areas and the local community may arise. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	No community complaints Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people as possible.

Equipment maintenance detail:

The Company should maintain the records for Health, Safety & Environment and hiring HSE manager to check and deal with the HSE issues. The company should maintain PPEs, medical facilities, firefighting Equipment's as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.



Environmental Budget:

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the project in operation stage of the project. Management of AAA Industry will allocate 1 million as Environmental Budget for meeting the following purposes:

Table 9: Environment budget detail

HSE training	On quarterly basis
Maintenance and management of environment	On regular basis
Maintenance of equipment	On regular basis
Restoration	As per requirement
Plantation	During the operation phase
Strategic planning to cope with any emergency situation	As per policy
Formulate the disaster management plan to cope with natural disaster	As per policy

Implementation of all these parameters will be included in the environmental budget. Any equipment failure will not be included in this budget.



ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED PROJECT OF M/S MS OIL & PROTEIN PROCESSING

Sr. No.	Aspects	Impact & mitigations to be taken			
		Impacts	Mitigation measures Operation	Responsibility	Monitoring
Ambient Air Quality					
1	Particulate Matter and Fugitive Dust Emissions	PM from boiler operations. Dust raised on dirt tracks by project-related vehicles.	• Sprinkling of water must be done to control the dust or PM • Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter. • PPEs should be provided to workers in case of particulate matter/dust • Vehicles/ machinery should be serviced regularly • Fabric Filters/ bag house will be installed. • Maximum possible plantation is recommended as it absorbs gaseous emissions as well as prevent lower atmospheric dust to move along with the air action. • Monitoring should be conducted as per EPA NEQS Rules.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK
2	Gaseous emissions	During the operational phase of the project, gaseous emissions from project related activities and power sources may affect the air quality of the project area. Project activities i.e., cooking of poultry waste can also impact the ambient air through VOCs. Air emissions i.e., CO, CO ₂ , SO _x , NO _x from boiler.	Industry should ensure the NEQS compliance and should not be allowed to emit hazardous pollutants. Boiler should be operated on natural gas which has low emission potential as compared to other fuel sources. Air Emission Control Measures are recommended to control the air emissions from hybrid boiler i.e., Cyclone, Scrubbers. Air Emission Control Measures are recommended to	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK



			control the air emissions from condensate (VOCs) i.e., Condenser with scrubbing system to eliminate fumes. Raw materials should be kept in covered cool, well-ventilated area to prevent foul smell due to decomposition products. Raw material should be utilized as early as possible & not be kept in waste storage halls more than a day. Regular cleaning and hygiene of waste storage halls should be ensured. Maximum possible plantation is recommended as it absorbs gaseous emissions as well as prevent lower atmospheric dust to move along with the air action. All project related machinery, standby generators, boiler will be checked regularly to ensure that are in sound working condition and are not emitting smoke. Regular monitoring as per NEQS is recommended for ambient air and stack emissions. Proponent should keep the records of monitoring and equipment maintenance.		
Noise Level					
3	Noise & Vibration	The major sources of the noise at proposed site are due to industrial activity, vehicles, machinery and generators, which can be a nuisance for the workers in the working area. - Heavy machinery operation and generators at the site is the main source of noise & vibrations. - High noise level may	- PPEs as Ear plugs/muffs should be provided to workers in case of high noise during working hours - Proper maintenance and tuning of the vehicles should be done. - Sound proof room should be built for generator (if any) to control the noise. - Rubber wounds should be placed underneath the generator to avoid the	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK



		cause hearing loss, deafness, high blood pressure, headache, depression and mentally disturbance. Noise level will not exceed 75 dB(A) at the boundary walls of industrial activity site and is located at a safe distance from the nearest human settlement. The maximum threshold level for the vibration is between 50 and 100 mm/S ppv have been suggested by Grimshaw (1971) as critical threshold level.	vibration. - Speed/ horn restriction should be imposed on all vehicles. - Noise level monitoring was conducted at different location and results are incorporated within the report - Monitoring should be conducted as per EPA NEQS Rules. - Maximum plantation is recommended within site area as it absorbs the noise waves and act as barrier		
Soil Contamination					
4	Soil contamination	- Soil may be contaminated due to raw material storage on unsuitable area, oil and other chemicals storage, transportation - Soil contamination due to waste water generated from municipal sources	Raw material i.e., poultry waste should be stored in properly constructed covered paved area to prevent leaching of contaminants in soil. i.e., in rainy seasons. Oil produces from the rendering process should be stored in safe storage and regular inspection & monitoring of the storage site should be done. Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated if hydrocarbon based spillage occur.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK
Health and safety					
4	Health and safety	- Health & safety issues of workers and nearby community - Health and safety issues will be arose during transportation, handling, loading and unloading, other industrial activities, by release of flue gases, operation of	- Training of workers should be conducted regarding health safety & environment. - Use of PPEs should be implemented at workplace. - First aid measures/medical facility should be provided to project related employees.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK



		machinery, improper practices of work etc.	• Safe drinking water must be provided to workers, staff & poor people of the area. • Water consumption records should be maintained • Safety signs & boards should be placed at during operation activity. • smoking or any drugs should be prohibited during working hours or performing work • Do not place any flammable or hazardous substance near the explosive material		
Wastewater					
5	Waste water	• Wastewater generation only from process & domestic activities in operation. • Waste water may cause Spread of diseases, underground and surface water contamination • High BOD can be a major impact from rendering process.	Industry should construct treatment facility to treat its wastewater before its final disposal. Rendering plant can generate more than one source of wastewater streams i.e., Condensate & washing activities, this process wastewater needs to be treated through chemical & biological treatment processes i.e., coagulation, sedimentation, chemical spraying/ injection, aeration etc. as it can contain TSS, BOD, Nitrogenous compounds i.e., ammonia. Wastewater generated from domestic activities, septic tanks will be constructed to treat it before disposal/ reuse. Treated wastewater will be used for plantation or can be used for sprinkling purpose on unpaved areas or simply drained out in nearby local drain present along with the northern boundary of the proposed site. Compliance of NEQS for Effluents should be ensured.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK



			Monitoring should be conducted as per NEQS and record should be maintained.		
Solid waste generation					
6	Solid Waste Generation	• Solid waste generation may cause land & soil contamination, aesthetic degradation, foul smell etc. • Solid waste may generate from the operational raw material & packaging material, domestic sources.	• A solid waste management team should be formulated. • Solid waste generated from the various activities should be utilized by recycling and reuse to the possible extent. • solid waste from the domestic sources should be disposed off properly by placing separate waste bins for reusable/ recyclable and other waste sources. • Constructional waste should be utilized for road filling or maintenance purposes.	HSE Department	Environmental Monitoring Approved Lab/ EPA KPK
Odor					
7	Odor	condensate from the water can cause foul smell as it contains VOCs. Unhygienic and delayed storage of raw material can cause severe odor.	To reduce odor from the condensate ammonia stripping and scrubbing with cool water is recommended. Storage halls should be regularly wash and wastewater should be treated in WWTP. Proper hygienic conditions should be maintained at site. Storage halls should be constructed in a way to ensure adequate ventilation and maintain low temperature inside. Raw material should not be kept for days as decomposition can initiate in 24-48 hours.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK
Biodiversity					
8	Biodiversity (Flora & Fauna)	untreated wastewater disposal can impact the downstream biodiversity as it can impact the dissolved oxygen of the downstream water body.	Proper wastewater treatment plant is recommended having chemical and biological treatment system to tackle TSS, BOD, COD.	HSE/ Project Manager	Environmental Monitoring Approved Lab/ EPA KPK



			Regular monitoring of wastewater as per NEQs is recommended.		
Socio economic impacts					
9	Culture and norms of the area	Socioeconomic impacts may arise due to: • Change in cultural language • Change in social behavior and economic gains • Social performance of the individuals in the area • Change in culture by the influx of nomadic people • Gender inequality	• Community wellbeing should be considered and anticipated measures are recommended to preserve the local culture and ecosystem • Local people should be preferred for the employment • The project proponent will initiate educational awareness program with the coordinator of local people. • The project proponent will assist the local impacted community for the improvement of local community. • Subject project will uplift the economic status of the nearest human settlements.	Project Proponent/ Project Manager	---



CHAPTER - 6

PUBLIC CONSULTATION & STAKEHOLDERS PARTICIPATION

This section deals with the social acceptability of the project and the area. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and build understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders. It gives the feeling of an ownership to the local population and public indolent is also helpful in smooth implementation and success of the project.

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identity the different types of stakeholders and ascertain their perceptions about the said project Environmental Impact Assessment (EIA) social survey was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

Objectives of consultation:

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

The important general objectives of the consultation process are:

- Information dissemination, education and liaison
- Informing the stakeholders about the subject project
- Providing an opportunity to local public to raise their views and helping in more sensitive considerations for the formation of mitigation measures for the subject project
- Providing those involved in the planning stage with an opportunity to ensure that the benefits of the proposal are maximized and that no major impacts have been overlooked



- It provides an opportunity to local public to influence the design of project in a positive manner
- Increasing public confidence in front of proponent, reviewers and decision makers
- Identification of problems and needs of the stakeholders and public
- Providing better transparency and accountability in decision making stage;
- Reducing conflicts through early identification of contentious issues and working on them to find acceptable solutions
- Reaction, comment and feedback of stakeholders on project
- Developing proposal which are truly sustainable

Methodology of consultation:

The EIA team carried out public consultations at various locations around the project site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, villagers, shops, passer-by etc. near the project area:

- 1) Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring residents, shopkeepers, drivers etc.
- 2) Environmental consultants and social specialists documenting the opinions of the stakeholders expressed during the meetings etc.

Stakeholder Identification:

Stakeholders considered at all levels according to the importance of the project. They are at provincial, district and local level. The process of consultation is an ongoing process which continues during the project life cycle and even after the submission of this environmental assessment report and so on. Therefore, three-tier approach was adopted. Stakeholders were identified, categorized and consulted at provincial, district level & local level.

Consultations with government, provincial and district level departments were carried out through meetings and visits while consultations with locals, neighbors and directly affected peoples were under taken during baseline study of the area.

A series of public consultations were required to get the feedback/ concerns of the different departments, Industries, local public and general public residing near the subject area.



Proponent:

Possible impacts and mitigation measures related to the said 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 environment friendly.

Responsible Authority:

Management of AAA Industry is the responsible authority to take all measures throughout the life cycle of the project.

Other Departments and Agencies:

For the impact analysis detailed meetings were held with the management of M/s MS Oil & Protein Processing, local community, institutes and NGOs. Issues were discussed that may affect the environment and also the implementation of said project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

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.

Environmental Practitioners and Experts:

Team of Hi-Tech Environmental Services (Pvt.) Ltd. visited the project site, had discussions with stakeholders and consulted with the local people of nearby and other neighborhoods to evaluate the project socio-economic impacts. Most of the people are unemployed and somehow educated, few of them get middle/high/ higher secondary level education and working as employee. People provide the massive information about the project and have positive remarks regarding the project development.

Affected & Wider Community:

There is no affected community present in the radius of our study area. PGEE team has consulted with the inhabitants of the nearby area of proposed project site. They provided positive remarks regarding the said project. Stakeholders' participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts.



Sample Size:

30 sample size were selected by the Team of consultants for conducting the socioeconomic survey. Women were mostly not willing to give personal information.

Affected and Wider Community

Social survey was conducted to consult with local community. Their concerns were noticed and discussed with proponent and their team. Majority was in favor of project their details are given below in **Table**

Table 13 Consultation with local people

Sr. No.	Name	Age	Education	CNIC	Address	Comments
1	M. Imran	40	Metric	NA	Sohawa	Job opportunities for local and environmentally friendly
2	M. Nadeem	35	Metric	NA	Sohawa	Job opportunities for local
3	M. Faraz	31	MSc	NA	Sohawa	Environmentally Friendly
4	Farooq	47	BSc	37202-13243179	Sohawa	Environmentally Friendly
5	M. Anas	26	BSc	37202-37744641	Sohawa	Job opportunities for local
6	M. Habib	26	Metric	42401-38453511	Sohawa	Job opportunities for local
7	Sakhawat Ali	46	Metric	37202-20423647	Sohawa	Roads to be built and Job opportunities for local
8	Ali Raza	32	Metric	37202-04223985	Sohawa	Roads to be built
9	M. Khursheed Awan	60	Metric	37202-12182689	Sohawa	Should be no dust and environmentally friendly
10	M. Arshad	62	Metric	37202-25031201	Sohawa	Should be no dust and Roads to be built
11	M. Fakhar	29	Metric	37202-885876933	Sohawa	Roads to be built
12	M. Arslan	26	Metric	37202-52833061	Sohawa	Should be water availability and roads must be built
13	M. Sageer	38	Metric	37202-51762813	Sohawa	Job opportunities for local



CHAPTER – 7

CONCLUSION & RECOMMENDATION

Based on the study conducted for Environmental Impact Assessment (EIA) for the subject project, the following conclusions are made:

Conclusion:

The EIA study reveals that the project is economically viable and socially acceptable and the proponent will implement the project in the environment friendly manner. He will adopt all the necessary measures to control any impact if resulting from the project. He is providing the safe drinking water, safe working environment, proper training and first aid facility to all workers and staff. The project is generating additional jobs during operation phases.

Recommendations:

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Tree plantation inside and near the project area is recommended.
- The Management of AAA Industry will continue to assist the local communities as a corporate/social responsibility.
- Use of narcotics and smoking is prohibited during working, filling or handling of fuel.
- PPEs must be provided to workers such as gloves, masks, etc.
- Proper solid waste management system must be adopted.
- Safety signs, safety board's etc. must be placed on site during various developmental stages.
- Machinery never being left in running condition.
- First Aid measures, health & safety Equipment (PPEs) are being provided to workers.
- The management of subject project will assist the local communities as a corporate social responsibility.
- Jobs and employment is being provided to the local area.

The present EIA report is enough to meet the administrative and legal framework. After the complete study of the project, it is concluded that project will not have significant adverse impacts on the nearby community and on environment. Overall the project will have positive impacts on the local population and country as a whole. Therefore, it is requested for the environmental approval for the subject project.



APPENDICES-I GLOSSARY

Act means the Pakistan Environmental Protection Act, 1997.

Regulations means the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environment Impact Assessment Regulations (IEE & EIA), 2000.

Screening is the first step of IEE/EIA study. It helps in determining whether a project requires an IEE or EIA.

Sensitive Receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants.

Sedimentation is the process of allowing particles in suspension in water to settle out of the suspension under the effect of gravity.

Contamination is introduction of impurities in the environment.

Environment means (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the inter-relationships between any of the factors in sub-clause (a) to (f).

Environmental Assessment a technique and a process by which information about the environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming their judgments on whether the development should go ahead.

Environmental Management to carry out the developmental activities in sustainable manner.

Impact on Environment means any effect on land, water, air or any other component of the environment, as well as on wildlife harvesting, and includes any effect on the social and cultural environment or on heritage resources.

Mitigation Measures means the measures for the control, reduction or elimination of an adverse impact of a development on the environment, including a restorative measure.

Project Proponent is a person, company, NGO or any agency that sponsors and promotes a project.

Soil Erosion means physical removal of soil either by wind or by running water.

Pollution means the presence in the environment or the introduction into it, of substances that have harmful or unpleasant effects.



Social Cohesion is defined as the willingness of members of a society to cooperate with each other in order to survive and prosper.

Afforestation is the planting of trees on land which was formerly used for land uses other than forestry is called afforestation.

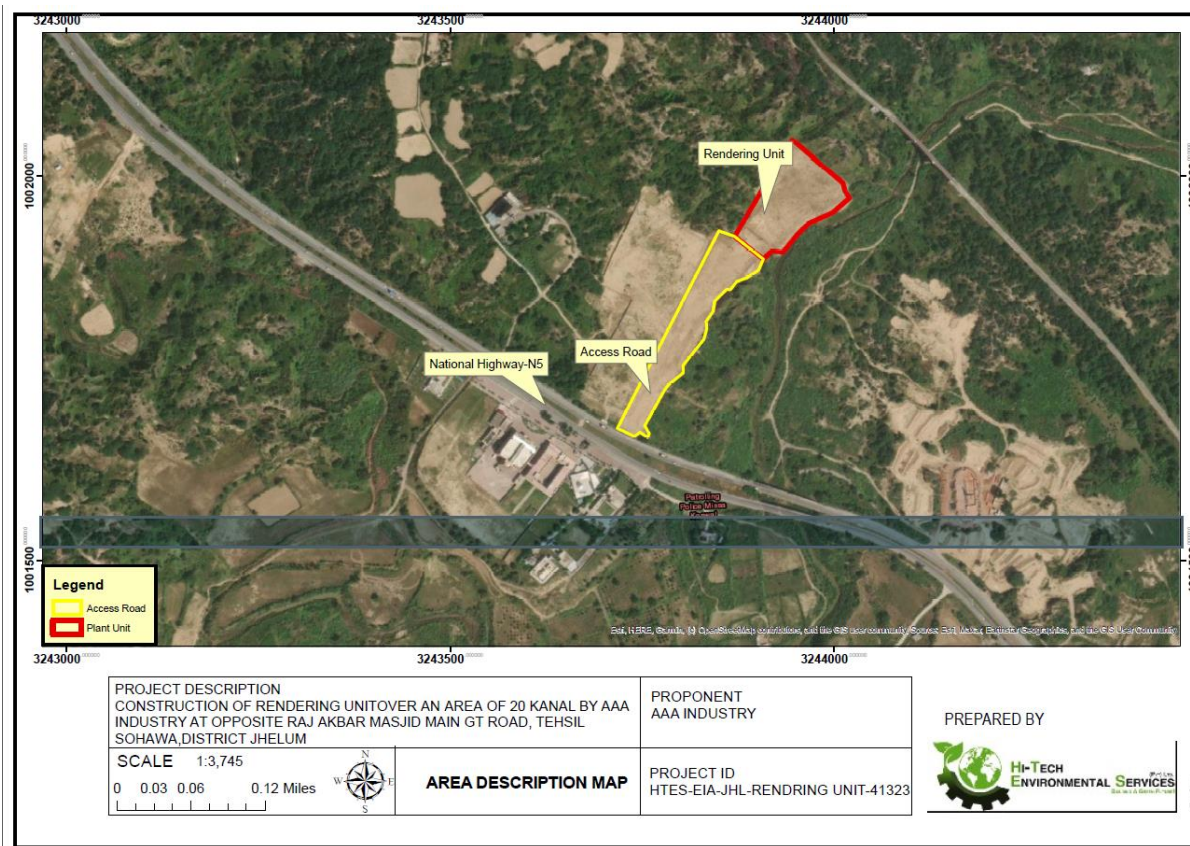


APPENDICES-II LIST OF ABBREVIATION

IEE	Initial Environmental Examination
EIA	Environmental Impact Assessment
ORD.	Ordinary
NOC	No Objection Certificate
EA	Environmental Approval
MICS	Multiple Indicator Cluster Survey
EMMP	Environmental Management & Monitoring Plan
EPA	Environmental Protection Agency
OHS	Occupational Health and Safety
NEQS	National Environmental Quality Standards
GOP	Government of Pakistan
MMD	Mines and Minerals Department
NCS	National Conservation Strategy
NGO	Non-Governmental Organization
BDL	Below Detection Limit
PPE	Personal Protective Equipment
TMA	Tehsil Municipal Authority
PPC	Pakistan Penal Code
PEPA	Pakistan Environmental Protection Act
NDWQS	National Drinking Water Quality Standards
LAA	Land Acquisition Act
GDP	Gross Domestic Product
CSR	Corporate Social Responsibility
GSL	Ground Surface Level
mm	Millimeters
dBa	Decibel Scale A
km	Kilometers
m	Meters
IUCN	International Union for Conservation of Nature



APPENDICES-III MAP OF THE PROJECT







APPENDICES-IV REFERENCES

- Punjab Environmental Assessment Rules, 2022
- *section 12 of Punjab Environmental Protection Act, 2022*
- Pakistan Environmental protection act 1997
- Guideline for the Environmental Assessment
- National Conservation Strategy- Pakistan
- Guideline for the public consultation
- National Resettlement Policy and Ordinance
- National Environmental Quality Standards (Self-monitoring and reporting by the industry)
- Labor laws
- Canal And Drainage Act, 1873
- National Environmental Policy 2005.
- The Land Acquisition act, 1894
- Meteorological data from meteorological department and website
- Pakistan Biosafety rules 2005
- Pakistan Environmental agency (review of IEE/EIA) regulation 2000.
- Sectorial Guideline for environmental reports,
- Pakistan Environmental Protection ordinance (PEPO), 1983
- OSHAS 18000 for health and safety
- US EPA



APPENDICES-V TERMS OF REFERENCES

The agreement hereinafter called Agreement, is made between M/s Hi-Tech Environmental Services (Pvt.) Ltd. (Consultancy Firm/Consultant) and AAA Industry (Client) to carry out follow up of Environmental Study/Environmental Impact Assessment (EIA) for obtaining Environmental approval under Section 12 of Punjab Environment Protection Act 1997 (Amended 2012) for proposed project of “Construction of Rendering Unit by AAA Industry at Opposite Raj Akbar Masjid Main GT Road, Tehsil Sohawa, District Jhelum.

The client has requested the consultancy firm to provide consultancy service to prepare and follow up of IEE Report and so that client may obtain Environmental Approval from EPA, Punjab under the Section 12 of PEPA 1997 (As Amended 2012) so mutually agreed terms and conditions are as under:

NOW THEREFORE, the parties here to hereby agree as follow:

- The client shall provide assistance and access to the information contained in the feasibility study, layout plan and other project relevant documents as and when required by the consultancy firm/consultant for performance of his obligations.
- The client shall provide all available data, maps, reports, etc. about the project including but not limited to layout plan of the project. Client will provide Lab Test Reports from EPA certified lab including noise level monitoring, wastewater analysis and stack emissions report or any report/document/information demanded by the EPA.
- The client will provide to the consultancy firm with the letter of introduction and authorization and other documents as may be needed to enable consultancy firm consultant to perform the service.
- Responsible to pay all the dues of the consultants as per the agreed terms and conditions.
- The consultancy firm/consultant shall carry out the services in accordance with the provisions of the agreement including:
- Shall follow up the EIA Report and other file required with due diligence necessary/required for obtaining its approval from EPA Punjab under the statutory requirements of PEPA 1997 (amended in 2012).
- Shall give the consultancy for the preparation of the detailed Environmental Management & Monitoring Plan for enhancing the environmental conditions during construction and operational phases such as mitigation measures for wastewater, solid waste, stack emissions, plantation, management of surface runoff, mitigation of socially adverse impact, if any.
- Will evaluate all the activities during the construction and operational phases and recommend suggestions/actions to comply with PEQS/NEQS.
- Will follow up the EIA report and file documents considering information/documents provided by the client.



- Shall examine the entire activities and list of the details of activities likely to cause adverse impacts during and after construction phase.
- Shall suggest mitigation measures for all such activities which may cause adverse impacts.

For and Behalf of

M/s Hi-Tech Environmental Services
(Pvt.) Ltd.
(Consultancy Firm/Consultants)

For and Behalf of

AAA Industry
(Proponent)



APPENDICES-VI CONSULTANT TEAM

Hi-Tech Environmental Services (Pvt.) Ltd. is a business entity managed by Geoscientists, GIS Experts and Environmental Engineers. The company has the expertise of highly diversified experience and as such the business company with the sole proprietorship has a wide range of service area as follows:

- a) Conducting field surveys
- b) Conducting baseline studies
- c) Preparation of feasibility reports, IEE report, EIA reports, of Developmental Schemes and projects.
- d) Assessment of impacts of developmental projects on environment and mitigating measures.
- e) Preparation of Environmental Management and Monitoring Plans.
- f) Preparation of solid waste management plans including proper handling and disposal.
- g) Preparation of maps by GIS experts.
- h) Proposing health and safety measures for developmental projects.

The contact details of consulting firm are given in Table 1-2.

Contact Details of the Consultant

Contact Details	
Consultant Company	Hi-Tech Environmental Services (Pvt.) Ltd.
Address	26-B Zahoor Ellahi Road Gulberg ,Lahore
Representative	Advocate Chaudhry Awais Ahmed
Contact	(+92) 3219443210
e-Mail	consultantshtma@gmail.com



The team carrying out the research project is presented in the Table

Team Carrying Out the IEE Study

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1	Engr. Maryam Nazir	Mining Engineer and GIS Management B.Sc. Mining Engineering	• Development of Maps
2	M. Hamza Tariq	Environmental Scientist B.S Hon. Environmental Sciences	• Impacts Assessment and Proposing their Mitigation Measures. • Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
3	Engr. Harris Naeem	Mining Engineer and GIS Management B.Sc. Mining Engineering	• Author of IEE Report • Development of Maps
4	Ch. Awais Ahmad	LLM (London)	• Site Visits • Legal Reviews • Coordination with Locals



APPENDICES-VII PLANTATION ESTIMATES

The green belt development not only functions as foreground and background landscape features resulting in harmonizing by amalgamating the physical structures of project site with surrounding environment but also helps as pollution sink.

▪ Objectives

It is necessary to develop green belt in and around the project site with suitable plant species to achieve following objectives:

- To combat the air pollution effectively.
- To improve the quality of local as well as regional air.
- To avoid problems of soil erosion, noise and dust etc.

There will be no tree cutting at site due to project operations. Hence, there will be no disturbance to vegetation. In addition, the proponent will do plantation as a potential environmental enhancement measure.

Following plantation plan will be followed during project's lifecycle.

Item	Description
Spacing between two plants	2.0m×2.0m
Total number of saplings planted	100
Species of plants may be planted	Ornamental Plants and Indigenous Species

Noted that the green-belt development will be carried out within and around the premises of the project area or as per planned by the proponent.

• Criteria for Selection of Plants Species

The plant species will be planted based on their ease of availability in the local market and their suitability of growth in the project area.



APPENDICES-VIII LAB REPORTS:



ENVIRONMENTAL PROTECTION AGENCY
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore



Validation # 487A

Validation for Stack & Ambient Monitoring / Sampling

Dated: 28-09-2023

Emission Monitoring under CTM-34 or OTM-39			
Facility Name & Address	AAA Industry	No of Stacks /Sampling Point	
Phone	Opposite Raj Akbar, Masjid Main GT Road, Tehsil Sohawa, District Jhelum		
Industry Category	Baseline Study		
Analyzer Model & Make	Thermo Analyzer, High Volume Sampler		
Average stack emission Values of CO, NOx (in mg/nm3)			
Excess Air / Excess Oxygen (%age): -			
Analyzer exposed for Ramp-Up phase to the sample gas for 5 minutes	Yes	NO	NA
Analyzer flow rate and EC temperature monitored during calibration and testing	Yes	No	NA
Test Data Phase of sample gas recorded with 15 second interval	Yes	No	NA
All key requirements to ensure QA/QC complied for said EPA approved Method	Yes	No	NA
Particulate Matter (PM) Monitoring / Sampling under USEPA Method 5 / 17			
Model & make of Iso-kinetic PM Assembly			
The PM sampling train is complete as per Method 5 & 17	Yes	No	NA
Leak Test performed prior to sampling	Yes	No	NA
Field data Sheet for PM Sampling filled during PM sampling	Yes	No	NA
Data for determining of "K" factor & DGM "Y" Factor filled during sampling	Yes	No	NA
All method key requirements during sampling were compiled to ensure QA/QC	Yes	No	NA
Filter of Particulate matter is suitable for metal Testing	Yes	No	NA
SOx sampling as per Method 8 (Thorin Indicator Method)			
The right absorbent solution is available for SOx Sampling	Yes	No	NA
The equipment is capable to maintain flow rate @ 2.0LPM or as per method 8 requirement	Yes	No	NA
Sampling for SOx is performed as per method	Yes	No	NA
Ambient Air Quality Monitoring by Automatic Monitors for CO, O3, SO2, NOx, PM2.5 & PM10			
In case of continuous monitoring at a site, One Point QC Check Single analyzer & zero/span check is performed every 14 days.	Yes	No✓	NA
The CE of NOx analyzer is ensured to be maintained within 96% - 104.1%	Yes✓	No	NA
Zero/span check is performed prior to starting ambient monitoring	Yes✓	No	NA
All key requirements for Critical & Operational Criteria for ambient air monitoring by automatic monitors were compiled during monitoring	Yes✓	No	NA
The measuring techniques of monitors comply PEQS	Yes✓	No	NA
Ambient Air Sampling of SPM, PM10, Pb by High Volume Sampler			
In case of Sampling for SPM through samplers, the flow rate of sampler complies PEQS (1.1m3/min).	Yes✓	No	NA
Calibration of Sampler performed prior to sampling	Yes✓	No	NA
Vehicular Emissions & Noise Measurement			
Sampling of Vehicle emissions and noise measurement have been performed as per method and SOPs	Yes	No	NA

Remarks (if Any):-

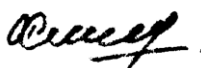
Signature


Research Officer
Environment Protection Agency
Punjab Lahore

Dated
25-26/09/2023

Signature
Irtaza Ahmad
Assist. Analyst







ENVIRONMENTAL PROTECTION AGENCY
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore



Validation # 487B

Validation for Wastewater & Drinking Water

Dated: 28-09-2023

Project / Unit Name with Address and contact details		AAA Industry		Sampling Point	
		Opposite Raj Akbar, Masjid Main GT Road, Tehsil Sohawa, District Jhelum			
Name of Private Lab		ESPAK			
Waste Water (WW) Treatment facility			Drinking Water (W) Treatment Facility		
Primary Secondary Tertiary NA ✓			Chemical RO NA ✓		
Total WW collected Sample 00.....			Total Collected Drinking water samples.....00....		
Sample Tag for testing parameter is assigned on sample container			Yes ✓	NO	NA
Sample is preserved properly for each testing parameter			Yes ✓	NO	NA
Sample size is adequate for testing the target parameters			Yes ✓	NO	NA
Wastewater Flow Measurement performed to ensure sample representativeness			Yes ✓	NO	NA
No. of Waste Water outlets	Waste Water Flow m ³ /hr from each outlet (Optional)	Water intake m ³ /hr (Optional)	Water Mass balance complied during sampling (Optional)	Sample Type Ground Water	
			Yes No	Grab ✓	Composite
Parameter	Matrix W WW	Container	Sample Size	Preservation	Yes NO NA
Coliform, Total or Fecal	✓ ---	Sterile Container	100 mL	Refrigerate 6 C	
Coliform, Total or Fecal, Chlorinated Water	✓ ---	Sterile Container	100 mL	0.008% Thiosulphate & cooled 6 C	
Color, Turbidity	✓ ---	P,G	500 mL	Cool 6 C	
Hardness, Total	✓ ---	P,G	500ml	HNO ₃ to pH<2	
Nitrogen, Nitrate + Nitrite, Phenolic Compounds, Oil & Grease, COD, NH ₃	✓ ---	P,G	2000 mL	H ₂ SO ₄ to pH < 2, Cool 6C	
Metals, General	✓ ---	P,G Rinsed 1.1 HNO ₃	500 mL	HNO ₃ to pH < 2	
Cyanide, Total	✓ ---	P,G	500 mL	NaOH to pH > 12, Cool 6C	
Pesticides, General	---	Glass	1 Liter	Cool 6 C	
Field Parameters*					
Field parameter		pH meter, Model Make	Measurement Method	Calibrated in Field	Measured value
pH				Yes NO	
Temp					
Cl					

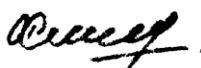
Signature


Research Officer
Environment Protection Agency
Punjab Lahore.

Dated
25-26/09/2023

Signature
Irtaza Ahmad
Assist. Analyst







ENVIRONMENTAL SERVICES PAKISTAN

CHEMICAL ANALYSIS TEST REPORT (AMBIENT AIR)



Reference Number: **ESPAK/0602P/23/AA/5885/00128** Date: **2/10/2023**
Name of Industry/Client: **AAA Industry**
Address: **Opposite Raj Akbar masjid main GT road, Tehsil Sohawa, District Jhelum**
Validation Officer: **Muhammad Nadeem, Research Officer**
Nature of Sample: **Ambient Air** Monitoring Location: **Mid - Point of Site**
Date of Sample Collection: **25/09/2023** Grab / Composite: **Continuous 24-Hours**
Sample Collected/Sent By: **Irtaza Ahmed, Analyst (Field), ESPAK**
Date of Completion of Analysis: **26/09/2023**

S. No	Parameters	Limit Values (PEQS-24 Hours)	Concentration	Method / Equipment Used	Remarks
1	Carbon Monoxide (CO)	5 mg/m ³ (8 Hours)	1.3 mg/m ³	Non Dispersive Infrared Absorption (NDIR)	Within Prescribed Limits
2	Sulfur Dioxide (SO ₂)	120 µg/m ³	12.1 µg/m ³	UV Fluorescence (UVF)	Within Prescribed Limits
3	Ozone (O ₃)	130 µg/m ³ (1 Hour)	21.2 µg/m ³	Non Dispersive UV Absorption	Within Prescribed Limits
4	Oxides of Nitrogen as NO	40 µg/m ³	13.5 µg/m ³	Chemiluminescence Detection	Within Prescribed Limits
5	Oxides of Nitrogen as NO ₂	80 µg/m ³	27.1 µg/m ³	Chemiluminescence Detection	Within Prescribed Limits
6	Particulate Matter PM _{2.5}	35 µg/m ³	31.5 µg/m ³	Particulate Sensor	Within Prescribed Limits
7	Particulate Matter PM ₁₀	150 µg/m ³	115 µg/m ³	Particulate Sensor	Within Prescribed Limits
8	Suspended Particulate Matter (SPM)	500 µg/m ³	387 µg/m ³	Particulate Sensor	Within Prescribed Limits

PEQS: Punjab Environmental Quality Standards for Ambient Air, 2016

Uncertainty of Measurement (UoM) data will be provided on request, where available. The statement of conformity, if provided in the report, is based on the decision rule of simple acceptance or rejection with equal shared risk due to measurement uncertainty.

Note:

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The values represent sample conditions when monitoring/testing was carried out.

The report data is not intended to be used legally by the client.

Only parameters marked with asterisk (*) are ISO 17025:2017 accredited.

1. Sample Analyzed By: **Irtaza Ahmed**
Analyst (Field)

2. Name of Chief Analyst with Seal: **Muhammad Arfan**

3. Signature of Incharge of the Environmental Laboratory:

Name: **Imran Malik**

General Manager

Date: **2/10/2023**

End of Report

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Arif





ENVIRONMENTAL SERVICES PAKISTAN

PAK EPA & PUNJAB EPD CERTIFIED

NOISE MONITORING REPORT



Reference Number: ESPAK/0602P/23/N/5886/00129 Date: 2/10/2023
Name of Industry/Client: AAA Industry
Address: Opposite Raj Akbar masjid main GT road, Tehsil Sohawa, District Jhelum
Validation Officer: Muhammad Nadeem, Research Officer
Nature of Sample: Noise
Date of Sample Collection: 25/09/2023 Grab / Composite: Continuous 24-Hours
Sample Collected/Sent By: Irtaza Ahmed, Analyst (Field), ESPAK
Date of Completion of Analysis: 26/09/2023
Method/Equipment Used: Sound Level Meter

S. No	Measurement Point	Limit Values (PEQS)	Noise Level in dB(A) Leq	Remarks
1	Mid - Point of Site - Day time	75 dB(A)	70 dB(A)	Within Prescribed Limits
2	Mid - Point of Site - Night time	65 dB(A)	58 dB(A)	Within Prescribed Limits

PEQS: Punjab Environmental Quality Standards for Noise in Industrial Area, 2016 Day Time Hours (6:00 am to 10:00 pm) Night Time Hours (10:00 pm to 6:00 am)
Uncertainty of Measurement (UoM) data will be provided on request, where available. The statement of conformity, if provided in the report, is based on the decision rule of simple acceptance or rejection with equal shared risk due to measurement uncertainty.

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The report data is not intended to be used legally by the client.
Only parameters marked with asterisk (*) are ISO 17025:2017 accredited.

- Sample Analyzed By: Irtaza Ahmed
Analyst (Field)
- Name of Chief Analyst with Seal: Muhammad Arfan
- Signature of Incharge of the Environmental Laboratory:

Name: Imran Malik
General Manager
Date: 2/10/2023

End of Report



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ENVIRONMENTAL SERVICES PAKISTAN

PAK EPA & PUNJAB EPD CERTIFIED

CHEMICAL ANALYSIS TEST REPORT (GROUND WATER)

Reference Number:

ESPAK/0602P/23/GW/5887/00125

Date: 2/10/2023

Name of Industry / Client:

AAA Industry



S. No	Parameters	Limit Values (DW-PEQS)	Concentration	Method / Equipment Used	Remarks
23	Manganese (Mn)*	≤0.5 mg/L	ND	U.S. EPA-200.7	Within Limits
24	Mercury (Hg)	≤0.001 mg/L	ND	U.S. EPA-200.7	Within Limits
25	Nickel (Ni)*	≤0.02 mg/L	ND	U.S. EPA-200.7	Within Limits
26	Nitrate (NO ₃ ⁻)	≤50 mg/L	21.5 mg/L	SMWW 4500NO ₃ -B	Within Limits
27	Nitrite (NO ₂ ⁻)	≤3 mg/L	0.1 mg/L	SMWW 4500NO ₂ -B	Within Limits
28	Selenium (Se)	0.01 mg/L	ND	U.S. EPA-200.7	Within Limits
29	Residual Chlorine	0.2-0.5 mg/L	ND	SMWW 4500-Cl B	----
30	Zinc (Zn)*	5.0 mg/L	0.2 mg/L	U.S. EPA-200.7	Within Limits
31	Phenolic Compounds (as Phenols)	NGVS	ND	SMWW 5530 C	----

DW-PEQS: Punjab Environmental Quality Standards for Drinking Water, 2016

SMWW: Standard Methods for the Examination of Water and Wastewater 23rd Edition, American Public Health Association, American Water Works Association, Water Environment Federation USA (2017)

USEPA: United States Environmental Protection Agency

NGVS: No Guideline Value Set

ND: Not Detected

Laboratory tests and measurements were carried out at 25 ± 5 °C and 50 ± 20 % Relative Humidity conditions unless required otherwise.

Uncertainty of Measurement (UoM) data will be provided on request, where available. The statement of conformity, if provided in the report, is based on the decision rule of simple acceptance or rejection with equal shared risk due to measurement uncertainty.

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1. Sample Analyzed By: Waqas Ahmad Analyst (ICP-AES) Ghulam Mustafa Analyst (Chemical) Khizra Bano Analyst (Microbiology) M. Shahid Analyst (Chemical)

2. Name of Chief Analyst with Seal: Muhammad Arfan

3. Signature of Incharge of the Environmental Laboratory:

Name: Imran Malik
General Manager
Date: 2/10/2023

End of Report



Page 2 of 2

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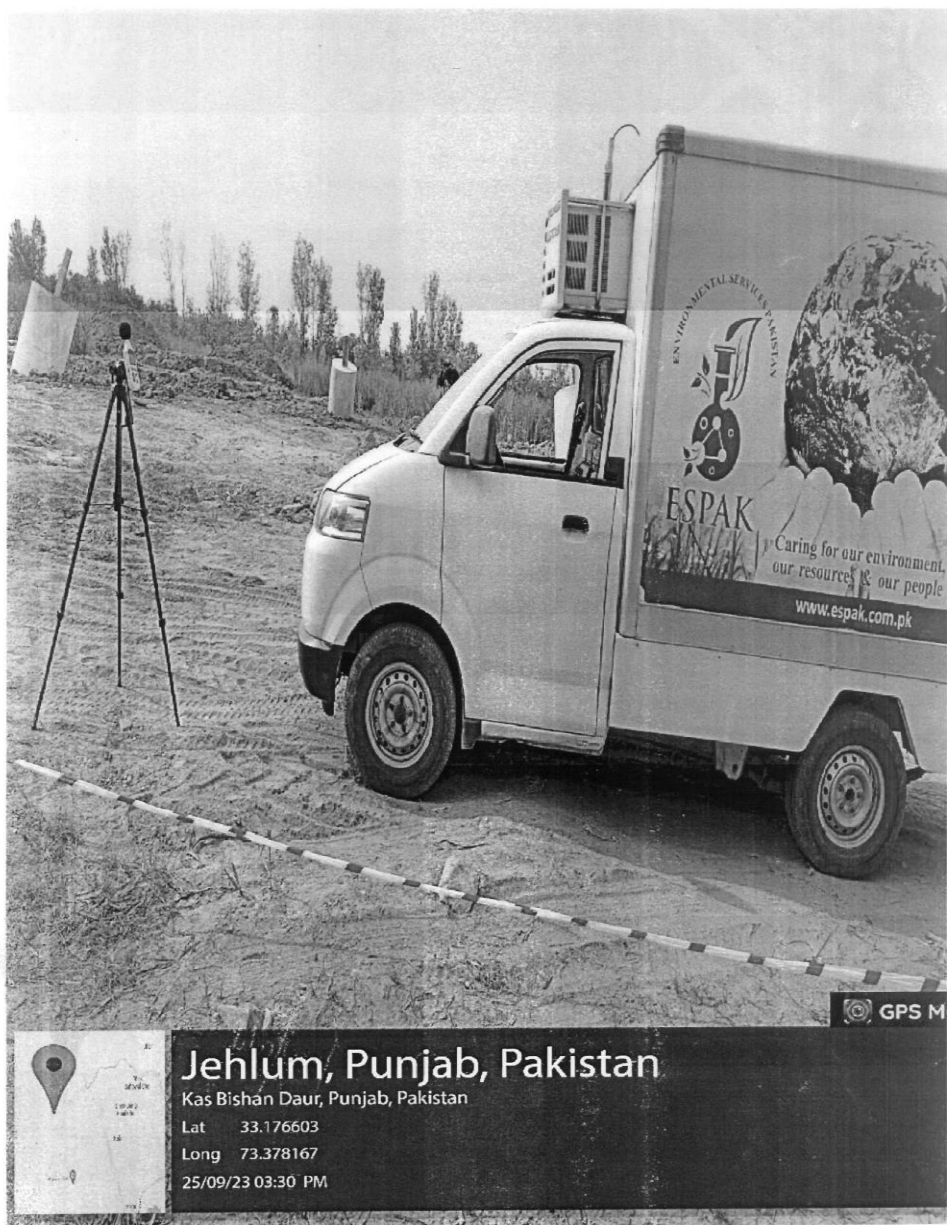
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ENVIRONMENTAL SERVICES PAKISTAN

PAK EPA & PUNJAB EPD CERTIFIED

CHEMICAL ANALYSIS TEST REPORT (GROUND WATER)



Reference Number: **ESPAK/0602P/23/GW/5887/00125** Date: **2/10/2023**
Name of Industry / Client: **AAA Industry**
Address: **Opposite Raj Akbar masjid main GT road, Tehsil Sohawa, District Jhelum**
Validation Officer: **Muhammad Nadeem, Research Officer**
Nature of Sample: **Ground Water**
Date Sample Received: **26/09/2023** Grab / Composite: **Grab**
Date of Sample Collection: **25/09/2023**
Sample Collected / Sent By: **Irtaza Ahmed, Analyst (Field), ESPAK**
Date of Completion of Analysis: **2/10/2023**

S. No	Parameters	Limit Values (DW-PEQS)	Concentration	Method / Equipment Used	Remarks
1	Total Coliforms	----	ND	SMWW 9221 B	----
2	Fecal Coliform Bacteria	Must not be detectable in any 100mL sample	ND	SMWW 9221 F	Within Limits
3	E. Coli	Must not be detectable in any 100mL Sample	ND	SMWW 9221 F	Within Limits
4	Color	≤15 TCU	ND	SMWW 2120 C	Within Limits
5	Taste	Non Objectionable / Acceptable	Acceptable	Organoleptic	Within Limits
6	Odor	Non Objectionable / Acceptable	Acceptable	Organoleptic	Within Limits
7	Turbidity	<5 NTU	<0.1 NTU	SMWW 2130B	Within Limits
8	Total Hardness as CaCO ₃ *	<500 mg/L	364 mg/L	SMWW 2340C	Within Limits
9	Total Dissolved Solids (TDS)*	<1000 mg/L	661 mg/L	SMWW 2540C	Within Limits
10	pH*	6.5-8.5	7.8	SMWW 4500H*B	Within Limits
11	Aluminum (Al)	≤0.2 mg/L	0.1 mg/L	U.S. EPA-200.7	Within Limits
12	Antimony (Sb)*	≤0.005 mg/L	ND	U.S. EPA-200.7	Within Limits
13	Arsenic (As)*	≤0.05 mg/L	ND	U.S. EPA-200.7	Within Limits
14	Barium (Ba)	0.7 mg/L	0.2 mg/L	U.S. EPA-200.7	Within Limits
15	Boron (B)	0.3 mg/L	ND	U.S. EPA-200.7	Within Limits
16	Cadmium (Cd)*	0.01 mg/L	ND	U.S. EPA-200.7	Within Limits
17	Chloride (as Cl ⁻)*	<250 mg/L	22 mg/L	SMWW 4500Cl ⁻ B	Within Limits
18	Chromium (Cr)*	≤0.05 mg/L	ND	U.S. EPA-200.7	Within Limits
19	Copper (Cu)*	2.0 mg/L	ND	U.S. EPA-200.7	Within Limits
20	Cyanide (CN ⁻)	≤0.05 mg/L	ND	SMWW 4500 CN ⁻ F	Within Limits
21	Fluoride (F ⁻)*	≤1.5 mg/L	0.2 mg/L	U.S. EPA 9214	Within Limits
22	Lead (Pb)*	≤0.05 mg/L	ND	U.S. EPA-200.7	Within Limits

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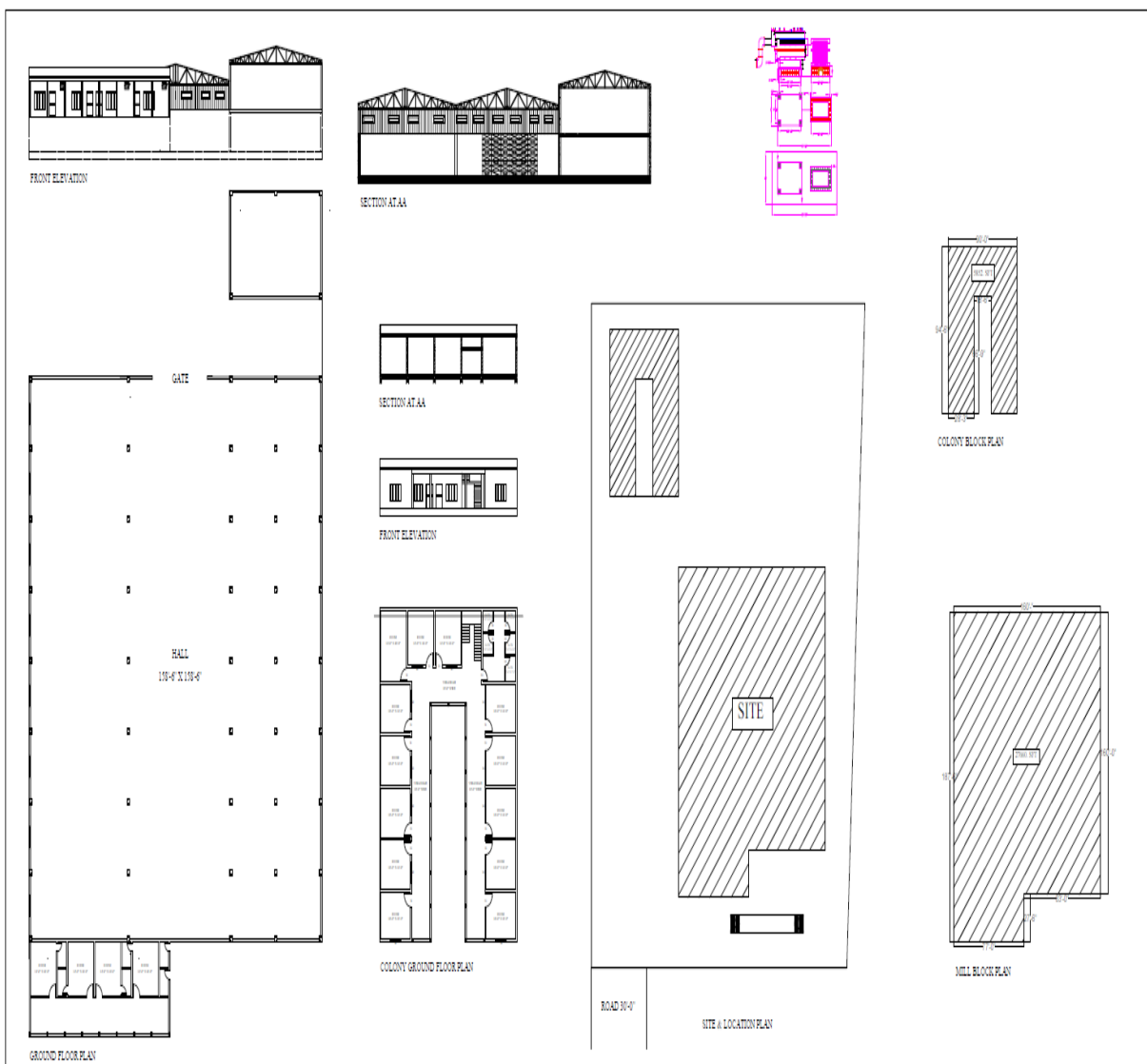
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APPENDICES-IX LAYOUT PLAN:



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