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LIST OF ABBREVIATIONS

PEPA	Punjab Environmental Protection Act
NEQS	National Environmental Quality Standards
PEQS	Punjab Environmental Quality Standards
WAPDA	Water and Power Development Authority
EMP	Environmental Management plan
WWTF	Waste Water Treatment Facility
Pak-EPA	Pakistan Environmental Protection Agency
W.H.O	World Health Organization
PET	Punjab Environmental Tribunal
SWM	Solid Waste Management
CSR	Corporate Social Responsibility
MSWs	Municipal Solid Wastes
TMA	Town Municipal Authority
KVA	Kilo Volt Ampere
PPEs	Personal protective equipment's
PM	Particulate matter

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EXECUTIVE SUMMARY

Project Title and Location

The project, for which this Environmental Impact Assessment (EIA) Study has been conducted, is the construction of seed processing, formulation of micronutrients & pesticide formulation unit by Agrium Enterprises having capacity of 15 ton/ day located at Plot No. B-80 Phase-IB M-3 Industrial City Faisalabad.

Mr. Tanveer Ahmad Khan, the proponent of project, is intended to get Environmental approval for the said unit by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 1: Details of Project Proponent

Name	Mr. Tanveer Ahmad Khan
CNIC	33100-2362140-1
Mailing Address	Plot No. B-80 Phase-IB M-3 Industrial City Faisalabad

The EIA Study Consultant

Environmental Services Pakistan (ESPAK), as independent consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address is Office No. 731, Block 2, Sector D1, Shah Jilani Road Township Lahore, Pakistan

Contact: 042-35154012, 0312-0849999

For the detail company profile see the *Chapter # 1 "Introduction"*

Positioning of the Project

According to the IEE and EIA Regulations, 2000 the Agrium Enterprises project falls under Schedule II (List of projects requiring an EIA), under the title "Pesticides (manufacture or formulations)".

Brief Description of the Project

The proposed project is the construction of seed processing, formulation of micronutrients & pesticide formulation unit under the name of Agrium Enterprises.

Brief Outline of the Proposal

Name of the proposed project	ETP Plant by Surge Laboratories
Purpose of the Project	To manufacture good quality pesticides with no banned products that can be used in agriculture. To provide advisory services to the farmers for proper usage of these pesticides.
Process Details	
Manufacturing Process	Pesticide formulation by coating of pesticides on sand granules to get the final product for agricultural use
Finished Products	Pesticides and micronutrients for agricultural use
Production Capacity	15 ton per day
Land Requirement	
Total Area of Industry	Total area of the unit is 3.65 Acre
Status and location	
Location of the proposed site	Plot No. B-80 Phase-IB M-3 Industrial City Faisalabad.
Description of project	Construction of seed processing, formulation of micronutrients & pesticide formulation unit having capacity of 15 ton/ day under the name of Agrium Enterprises.
Water Requirement	
Water consumption for the project	1000 Liter/ day during construction phase
Ways of extraction	Motor pump
Source of Water consumption	Underground.
Amount of waste water	20% of total used water. 80% water will be recycled within company.
Source of waste water	Constructional and Domestic Waste
Mode of treatment	During land development septic tanks will be installed for the safe disposal of domestic and constructional wastewater.
Solid Waste	
Source of solid waste generation	Construction and Domestic sources
Mode of disposal	Construction waste will be reuse in construction. Domestic waste will be handed over to local contractors.
Solid waste during operation of unit	Waste only from offices and Process.
Manpower	
Labor Force	About 25 persons during construction
Labor Force	About 20 persons during operations
Power requirements	
Source of power	Power requirements at the project site will be fulfilled by WAPDA.

Location

Land coordinates are given below:

North……King Kong Industries Pvt.

South……Time Ceramics (Pvt.) Limited

East…… Entrance gate of Industry

West…… Drain 1km away from project

For further details, layout of the project is attached as Annexure-B, Google earth map and aerial view of the project site.

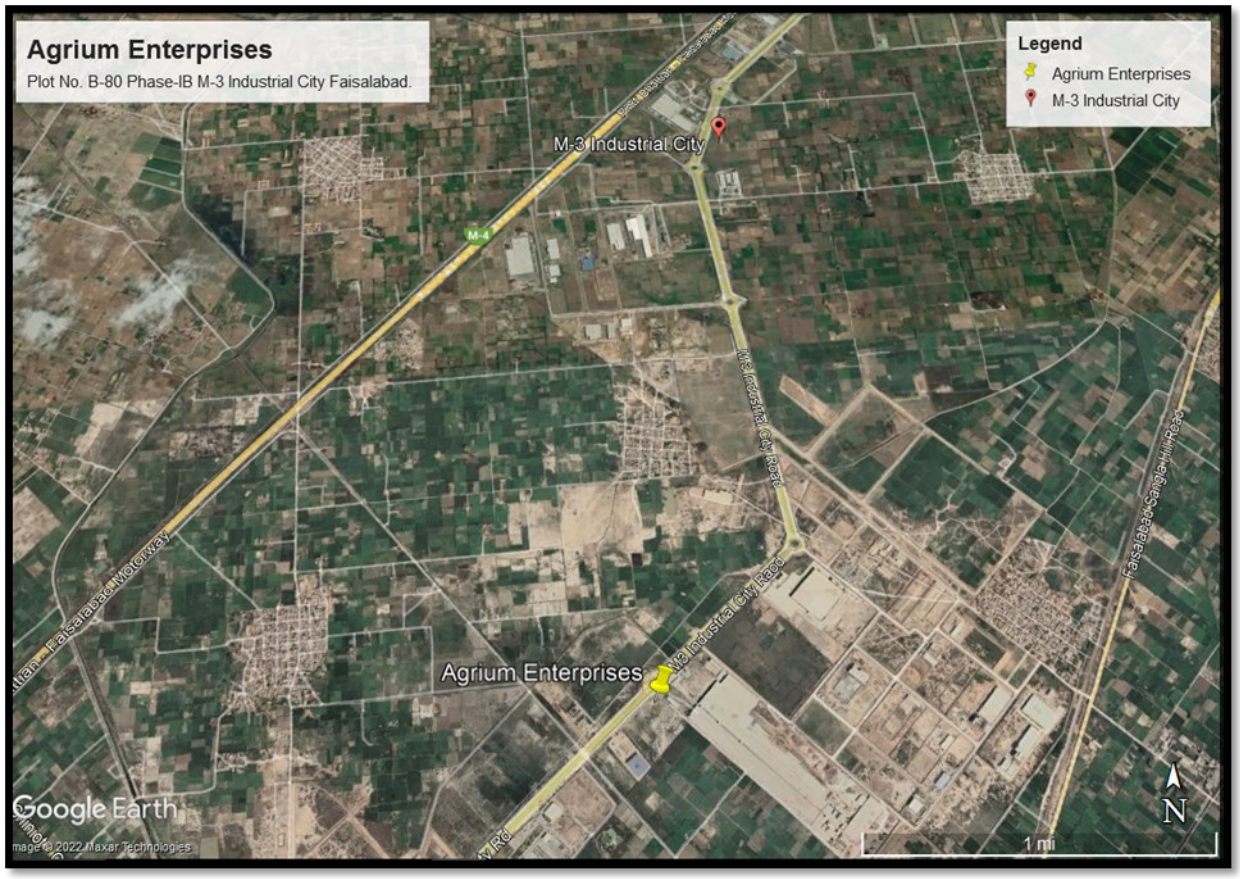


Figure 1: Google Map of Project Site

Google Coordinates: 31°35'46.06"N, 73°10'50.15"E

Major Impacts & their Mitigations

In order to identify all the activities associated with the project during construction & operation phase with

potential to cause significant environmental impacts and harm a thorough review has been conducted. Project will not have significant negative impacts on the nearby community and on environment. And, the project will have positive impacts on the local population and country as a whole. Moreover, area for plantation is also reserved for environmental enhancement measures.

Table 2: Summary of Major Impacts during Construction & Operation Phase

Pollutant	Constructional Phase	Operational phase
Particulate matter (PM)/dust	• Particulate matter will be generated during the constructional and transportation activities at the site • Due to raw materials loading/ unloading	• During the operational phase dust will be only be generated due to transportation vehicles. • PM will also be produced by sieving and mixing of material.
Gaseous emissions	• Flue gases will be generated due to site generators and vehicles	• Flue gases will be generated due to generators and vehicles. • Gaseous emission reports are attached.
Noise	• Noise will be only generated due to construction machinery and vehicles transporting materials	• Noise will be only generated due to generator, machines and vehicles transportation.
Odor	• Nil	• Nil
flora and fauna	• No significant impact on flora and fauna.	• No significant impact on flora and fauna.
Solid Waste	• Solid waste will be generated due to construction and domestic sources. Also due to sludge from septic tank	• Solid waste will be generated from domestic sources and process activity. Also due to sludge from septic tank treatment facility.
Soil Contamination	• Soil can be contaminated due to leaching of oil from generators	• Soil can be contaminated due to leaching of oil from generators
Waste water	• Waste water will be generated from constructional and domestic sources	• Waste water will be generated due to domestic sources. • In process water is used in washing and cooling process. 80% of that water is recycled. Remaining 20% is disposed off to nearby drain after treatment in septic tank.
Health and safety issues	• Health and safety issues will be arising due to machinery handling and constructional activities	• Health and safety issues will be arising if flue gases or noise exceed the permissible limits of PEQS, and improper practice of

Pollutant	Constructional Phase	Operational phase
		work during storage, handling and transportation of fuel.
Socioeconomic	• Disturbance to workers	• Employment opportunity

Recommendation for Mitigation Measures

Pollutants	Recommendations during Construction phase	Recommendations during Operation phase
Particulate matter (PM)/dust	• Sprinkling of water will be done • All constructional raw material will be kept covered.	• Dust collectors are installed in sieving and material mixing area where particulate matter is produced. • Maintain vehicle speeds
Gaseous emissions	• Constructional machinery and vehicles will be tuned and maintained properly. • All project vehicles will be checked regularly	• Canopies should be built over generators to avoid noise pollution. (if any) • Generators should be maintained properly. • PPEs should be provided to workers where needed. • All the places within the unit are paved to avoid any dust emissions during loading/unloading and transportation. • No gaseous emission will occur due to process activity.
Noise	• Vehicles to carry raw materials will be operated during night time as far as possible. • Ear plugs will be provided in case of heavy noise	• Ear plugs/muffs will be provided to workers in case the noise exceeds the PEQS during working hours. • Proper Maintenance of machines and generated will be done to avoid noise. • Trainings for safe driving practices & HSE trainings of the employees and workers will be recommended. • Within the unit, horns are prohibited during working hours and speed limit of 15 km/hour should be permissible.
Odor	• Nil	• Nil
Impacts on flora and fauna	• Area for plantation will be reserved.	• Area for plantation will be reserved.

Pollutants	Recommendations during Construction phase	Recommendations during Operation phase
Solid Waste	• Constructional waste will be utilized for road filling and maintenance • Domestic waste was disposed of properly, handed over to contractors, placed in bins.	• Solid waste produced from company is both hazardous and non-hazardous waste. • Waste bins are placed at suitable places. • Colored Bin System is already implemented in company.
Soil erosion/Soil Contamination	• Placed plastic sheet under generator to avoid leaching (if any) • Less removal of vegetation or clearing of land	• Placed plastic sheets under leaching material to avoid leaching or the leaching material should be placed over concreted area. • Soil contamination will be controlled by maintaining leakage record of vehicles, and by regular inspection.
Waste water	• Construction waste will be treated in septic tank before disposal in any drain.	• Waste water from Industry will be treated in Septic tank. • Waste water after treatment is disposed off to the nearby drain.
Health and safety issues	• PPEs will be provided to workers during constructional activities. • First aid will be provided to project related employees. Specially the worker dealing with loading and unloading of Fuel	• Agrium Enterprises has designated teams for HSE concern Emergency Response Teams (ERTs) and emergency equipment like fire extinguishers, spill kits, water hydrant system, effective use of PPEs and first aid are already well managed.
Socioeconomic	• PPE'S will be provided to people. • Job opportunity was provided to local people of the area	• Community wellbeing should be considered and neighbor's privacy should not be disturbed. • Local people should be preferred for the employment.

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**

Regular monitoring for ambient air should be conducted during construction & operational activities of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during construction & operational phases of the project and report should be submitted to EPA Punjab.

- **Water Quality**

Regular monitoring of water quality should be conducted during construction & operational phases of the project and report should be submitted to EPA Punjab.

Schedules of Proposed Monitoring:

Sr. No.	Parameters	Monitoring Schedules
1	Ambient Air Monitoring (NO_x, CO_x, SO_x, VOCs, PM_{10}, $PM_{2.5}$)	Monthly
2	Noise Level	Monthly
3	Water quality	Monthly

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

CHAPTER # 1
INTRODUCTION

The development of any Project brings about changes, both positive and negative, in the environmental and social settings of the Project Area. The intensity and the level of change, however, depend upon the nature of the project and the baseline environmental conditions of the area.

Purpose of the report

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore for the compliance of Section 12 of Punjab Environment Protection Act-1997 (Amended 2012) for obtaining No Objection Certificate (NOC) before starting the construction activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation writer
- Guidelines for sensitive and critical areas.
- Detailed sectorial guidelines

Various aspects like environmental, social, physical and other aspects of the project both during construction and its regular occupancy are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers (EPA Punjab), before issuing the desired Environmental Approval.

Identification of the Project

According to the IEE and EIA Regulations, 2000 the Agrium Enterprises project falls under Schedule II (List of projects requiring an EIA), under the title “Pesticides (manufacture or formulations)”.

The Proponent

Mr. Tanveer Ahmad Khan, the proponent of project, is intended to get Environmental approval of said unit by submitting the Environmental Impact Assessment Report for the compliance of section 12, PEPA, 1997 (Amended 2012).

Table 3: Details of Project Proponent

Name	Mr. Tanveer Ahmad Khan
CNIC	33100-2362140-1
Mailing Address	House No. P-40 West Canal Road Canal Garden Faisalabad.

TORs of the study between Proponent & Consultant under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as ANNEXURE-A.

The Consultant

Environmental Services Pakistan (ESPAK) as independent consultants has been appointed by the proponent to conduct Environmental Impact Assessment (EIA).

Company office address is Office No. 731, Block 2, Sector D1, Shah Jilani Road, Township, Lahore, Pakistan
Contact: 042-35154012, 0312-0849999

The current work has been carried out by the following professionals:

EIA TEAM & QUALIFICATION EMPLOYEES			
Sr. No	**Names**	**Designation**	**Qualification**
1.	Ayesha Khalid Bajwa	Environmentalist	BS Environmental Sciences
2.	Syed Shahzaib Ali	Senior Field Officer	B.Sc. Environmental Engineering
3.	Ms. Mamoona Kanwal	Environmentalist	BS Environmental Sciences, M.Phil. Environmental Sciences (Continue)
4.	Shahzad Ahmad Khan	Business Development Manager / Project Coordinator	MBA Marketing

Brief Description of Project

Nature & Size of Project

The project, for which this Environmental Impact Assessment (EIA) Study has been conducted, is the Construction of seed processing, formulation of micronutrients & pesticide formulation unit having capacity of 15 ton/ day under the name of Agrium Enterprise located at Plot No. 80-B Phase-1 M-3 Industrial City Faisalabad and total cost of the project is 1770 Million.

Location

Land coordinates are given below:

North……King Kong Industries Pvt.

South……Time Ceramics (Pvt.) Limited

East…… Entrance gate of Industry

West…… Drain 1km away from project

For further details layout map of the project is attached as Annexure-B, Google earth map and aerial view of the project site.



Figure 2: Google Map of Project Site

Google Coordinates: 31°35'46.06"N, 73°10'50.15"E

Screening/ Type and Category of Project:

EIA is mandatory according to Section 12 clause (1) of the Pakistan Environmental Protection Act (PEPA, 1997) (Amended 2012) for all developmental interventions. As the project falls under Regulation 4 in Section B-7 in category of projects mentioned in Schedule II under the title "Pesticides (manufacture or

formulations)"of Punjab Environmental Protection Agency's Review of EIA & EIA Regulations, 2000, the guidelines for the preparation and review of environmental reports, an Environmental Impact Assessment (EIA) of the project is required.

Objective of the Report

Objectives to conduct EIA are as following:

- It is mandatory according to Punjab Environmental Protection Act-PEPA 1997 (Amended 2012).
- To evaluate the ability of the site in view of social acceptance and environmental soundness.
- To provide the maximum information to the proponent and other stakeholders about the existing environmental conditions and the implications of the operational project.
- Collection of available data, reports, drawings and other relevant information about area of operational project.
- Review of applicable existing environmental legislation and Punjab environmental quality standards (PEQS).
- Propose mitigation measures to eliminate or to reduce the negative impacts to an acceptable level.
- Development of well-resourced environmental management and monitoring plans to identify mitigation strategies targeted towards avoidance, minimization and rehabilitation of the impacts.

Scoping

The key activities of this phase include:

Project Data Compilation: A generic description of the activities relevant to environmental assessment is compiled with the help of the proponent.

Published Literature Review: Secondary data on weather, water resources and vegetation, and other relevant environmental features of the project area and the similar projects, is reviewed and compiled.

Legislative Review: Information on relevant legislations, regulations, guidelines, and standards is reviewed and compiled.

Identification of Potential Impacts: The information collected is reviewed and potential environmental issues are identified.

Identification of Mitigation Measures: Mitigation measures are identified for all the likely impacts in order of preference for avoiding the impacts altogether, minimizing their frequency or extent and compensating or rectifying the losses; as may be found practicable in the project.

Selection of Alternatives: Based on the potential impacts and the cost required to mitigate them, most crucial project employing the best available technology at the most feasible site is selected.

Scoping Meeting: A scoping meeting was held to share this basic level of project information with all the project stakeholders before the information is incorporated into the report, so that some improvement can be sought out in the data as may be necessary, better or more friendly alternatives can be selected, and better and more practicable mitigation measures can be suggested.

Spatial and Temporal boundaries

The project, for which this Environmental Impact Assessment (EIA) Study has been conducted, is the Construction of seed processing, formulation of micronutrients & pesticide formulation unit having capacity of 15 ton/ day under the name of Agrium Enterprises located at Plot No. 80-B Phase-1 M-3 Industrial City Faisalabad. The project is already in industrial area. Devices are installed to control pollutant concentrations. It will make sure to maintain emissions level according to the limits of Punjab Environment Quality Standards, and so there are minimal chances of gaseous emission with respect to time, space and location.

Important Issues and Concerns Raised during Consultation:

Issue	Aspect/ Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job in executive level. Max. Persons according to the requirement will be employed by the industry.
Training Opportunities	People are keen to consult with subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design. Installation of training facilities in for worker of the company and students will also be accommodate.

		The internship program will offer to the students to develop professional skills.
Health & safety	Health and safety issues may be arising due to industrial and constructional activity.	All possible safety measures will be taken during operation and construction phase. Agrium Enterprises has designated teams for HSE concern a.k.a. Emergency Response Teams (ERTs) and emergency equipment like fire extinguishers, spill kits, water hydrant system, effective use of PPEs and first aid are already well managed.
Local economy and business development	Local service providers are keen to participate in providing services to provide raw material and expect to receive in order to adjust their businesses to meet specific needs.	Proponent has main focus that they will all the material regarding construction to buy from the local market. This will help the local and small business and to people who are keen interested to become suppliers.
Environmental Issues	Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to nearby residents. Environmental degradation during construction.	Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. A Participatory Environmental Monitoring Program will be launched to spread awareness. Company also have certification of Environmental Management System (ISO-14001:2015).
Water quantity and quality	Water quality and quantity, and impacts from the wastewater disposal are all key concerns for nearby community.	Implementation of consultation in relation to water use, recycle and development of the Participatory Environmental Monitoring Program.

Significant impacts and factors to be determined

Significant Issues Considered during EIA Study It was unanimously agreed by almost all the consultation participants that the project is necessary to establish the Pesticide unit to manufacture good quality pesticides with no banned products that can be used in agriculture and to enhance economic growth of the country. However, most of the participants are of the view that Strategic Level Environmental Impacts and their mitigations should be added in the project during EIA study.

Methodology of EIA Report

EIA Study comprises of Executive Summary following eight chapters as detailed below;

Chapter 1, Introduction; gives rational and overview of the Project, need for Environmental Impact Assessment study, its objectives and finally structure of the report.

Chapter 2, Description of Project; gives a rather detailed account of the Project particularly emphasizing those Project components which are of importance in relation with environmental and social aspects.

Chapter 3, Description of Environmental and Social Baseline Conditions; provides information about the environmental and social settings of the Project Area including geology, climate, flora, fauna, water resources, socioeconomic conditions etc.

Chapter 4, Potential Environmental Impacts and their Mitigation Measures; identifies the potential impacts due to the implementation of Project on the physical, biological and social environment of the Project Area.

Chapter 5, Environmental Management and Monitoring Plan; outlines the environmental management plan, identifies the roles and responsibilities to implement EMMP, suggest monitoring frequencies of various parameters and EMMP costs etc.

Chapter 6, Stakeholders and Public Consultations; deals with the outcome of the consultation carried out with the local communities, knowledgeable people, public representatives, etc. It discusses the concern of various types of the people and provides an outline how these have been addressed within the study of the Project.

Chapter 7, Analysis of Alternatives; describes the analysis of alternatives, which could be site alternative, design or technology alternatives.

Chapter 8, Conclusion and Recommendations; sums up the report and conclusions and recommendations resulting from the study

CHAPTER # 2

DESCRIPTION OF PROJECT

This chapter presents all aspects of the project. It describes the nature of the project, its location, designs and site layout/ plan. It presents the activities that will be involved during all stages of project; how product will form, detail of process and machinery as well as details on supportive resources i.e. man power and utility requirements.

Type & Category of the Project

According to the IEE and EIA Regulations, 2000 the Agrium Enterprises project falls under Schedule II (List of projects requiring an EIA), under the title "Pesticides (manufacture or formulations)".

Objective of Project

Following are the main objectives of the project:

- To manufacture good quality pesticides with no banned products that can be used in agriculture.
- To provide advisory services to the farmers for proper usage of these pesticides.

Location & Site Layout of Project

To fulfill the Industrial aspects of the project under reference of this EIA Report, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements. Master Plan Showing Industrial Nature of project Site Attached as ANNEXURE-K.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

The site selected on the following reasons:

- Easy access to road
- Site is safe from any kind of flood
- Site is away from residential areas
- Adjacent land is also property of owner.
- Area of land availability was enough.

Land coordinates are given below:

North……King Kong Industries Pvt.

South……Time Ceramics (Pvt.) Limited

East…… Entrance gate of Industry

West…… Drain 1km away from project

For further details layout map of the project is attached as Annexure-B, Google earth map and aerial view of the project site.

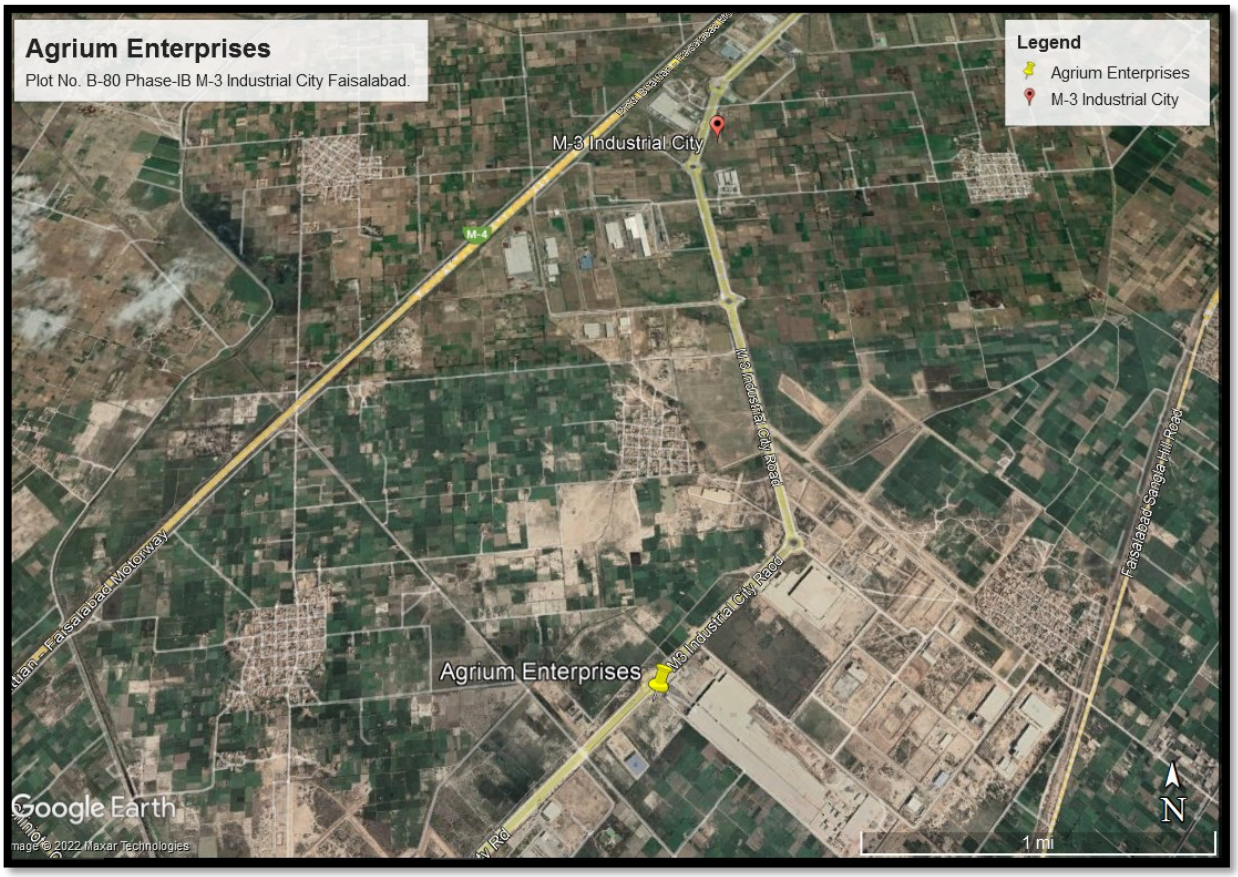


Figure 3: Google Map of Project Site

Google Coordinates: 31°35'46.06"N, 73°10'50.15"E

Land Use & Vegetation Features on Site

The land is fall in industrial area. The site is open land. The land is free from any type of vegetation. Small grasses and weeds are present in small amount at the site and there is no need to clear any vegetation because they are out of vicinity of the project.

Road Access

Main Road is present at east of project site.

Cost & Magnitude of the Project

Total cost of the project is 1770 million. Cost includes the entire thing regarding this project. The production capacity of the unit is 15 ton/ day.

Air Emissions

Air Emissions Particulate dust will be generated during construction phase and to deal with the air emissions during the operational phase wet scrubber will be installed with the efficiency >85%.

Wet Scrubber deign and working principle

Scrubbing liquid is introduced into the scrubber as a spray directed down over a circular “scrubbing vane” arrangement. As the liquid drains through the vanes, it creates curtains of scrubbing liquid. Dust laden gas enters the scrubber tangentially and collides with the curtains initiating particle agglomeration. The coarser particles produced are washed down to the slurry outlet. A restriction disc located in the scrubbing vane assembly accelerates the spin velocity of the gas. This action combined with the flood of atomized liquid from the spray causes the formation of fine liquid droplets which encapsulate the fine particulates, again enhancing agglomeration. The cyclonic action of the saturated gas stream as it spins upward forces the agglomerated particles to fall out of suspension. The coarser droplets impinge on the mist eliminator vanes and the finer droplets are forced to drop out of suspension by gravitational and centrifugal forces acting on the gas stream as it exits through the top.

Schedule of Implementation

Detailed feasibility studies and designing of the project have been completed. Necessary legal, administrative and financial formalities have been also completed. The project is expected to be completed within 3 months from the date of environmental approval. Subsequently the construction, operational and maintenance aspects of the project will be undertaken by the proponent.

Schedule of implementation

Sr. #	Activities	3 Months		3 Months			4 Months			2Months			
		4W	4W	4W	3W	5W	4W	4W	4W	4W	4W	3W	1W
1	Designing												
2	Mobilization of Contractors												
3	Lean Construction Period												
4	Peak Construction Period												
5	Restoration of Site												

Project Description

Subject project is the construction of seed processing, formulation of micronutrients & pesticide formulation unit. Total area for the subject project is 3.65 Acre. Production capacity could be varied according to the demand (15 ton/day) and total cost of the project is 1770 Million.

Raw Materials

A detail of raw material used in formulation of pesticides is given below along with its quantity.

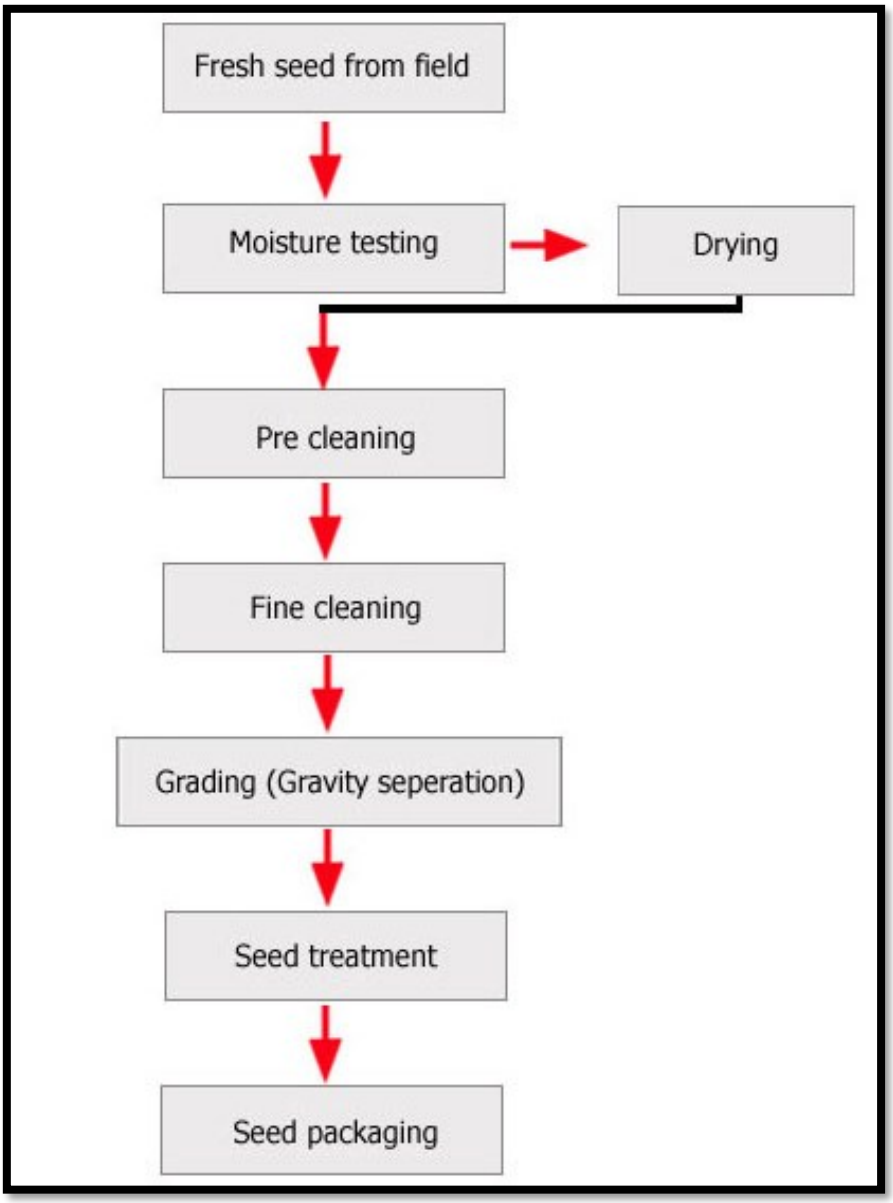
Sr. No.	Description	Make	Quantity Used
1	Sand in granular form	Swabi-Mardan (Locally Available)	90%
2	Pesticide ▪ Fipronil ▪ Cartap	China (Imported)	0.4 % for Fipronil Product 4 % for Cartap Product
3	China Clay	(Locally Available)	3-4%
4	PVA as Sticker	Japan/China (Imported)	-

Project Process

Agrium Enterprises is going to do construction of seed processing, formulation of micronutrients & pesticide formulation by coating of pesticides on sand granules to get the final product for agricultural use. These formulated granules are used as pesticide. Major equipment for operation consist of Sand Grader, Sand Dryer,

Sand Weighing Scale, Sand Coating Mill with allied Showering & allied Powder Spreading System, Final Dryer with small burner, Screening / Grading of final product, Final Packing Machinery.

Flow charts of process activities for Seed Processing



Step 1: Drying of seed

Seed drying should reduce the seed moisture content to safe moisture limits to maintain its viability during storage

Natural drying

Drying of the harvested crop is carried out in the field by the radiant energy of the sun. To achieve uniform drying, the seeds are spread in thin layer. High moisture content seed with a moisture content of more than 17% are dried first under shade / light to reduce the moisture content less than 17% and then dried under heavy sun i.e. noon drying.

Step 2: Pre Conditioning and Pre Cleaning

Pre Conditioning: Isolation of seed from plant parts with which it was harvested.

Pre- Cleaning: Removals of external materials like trash, stones, clods which are either in larger size or lighter in weight. No pre cleaning is required for hand harvested and winnowed seeds.

Seed Scalper:

It removes the larger inert matter from the seed. If it contain a single sieve it is called as scalpers, two sieves-rough cleaners. The unit consist of a vibrating or rotating screen or sieve having perforation large enough to allow the rough seed pass through readily.

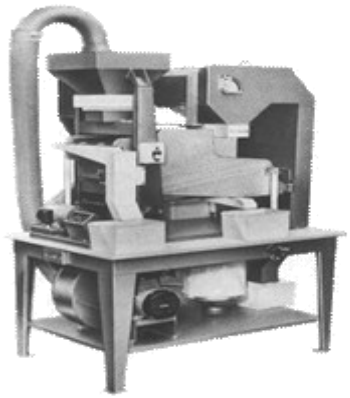


Step 3: Fine Cleaning

The second stage of cleaning is carried out with air blasts and vibrating screens and is applicable to all kind of seeds. It is essentially the same as scalping but more refined. It is performed mostly by one machine known as air-screen cleaner

Air-Screen cleaner cum grader

The air-screen machine is the basic cleaner in most seed processing plants. Almost all seed must be cleaned by air-screen cleaner before specific specifications can be attempted. Machine size varies from small, two-screen farm models to large industrial cleaners with 7-8 screens.



Step 4: Cleaning and Grading

To obtain quality seed, it is necessary to clean the seed obtained from the farm to get rid of inert materials, weed seeds, other crop seeds, other variety seeds, damaged and deteriorated seed. Different kinds of seed can be separated when they differ in one or more physical characteristics. Physical characteristics normally used to separate seeds are size, shape, length, weight, colour, surface texture, affinity to liquids, electrical conductivity etc. The problem lies in identifying the most important properly and use the machine that separates seed using the identified property.

Upgrading

Seed lots require further cleaning treatment to remove adulterants that are similar to pure seed in size and shape, to be separated by air screen cleaner. Removal of seeds larger or smaller than required size (sizing) and removal of cracked, damaged or otherwise defective seeds (grading) is accomplished in this final stage of processing.

Step-5: Specific gravity separation

This method makes use of a combination of weight and surface characteristics of the seed to be separated. The principle of floatation is employed here. A mixture of seeds is fed onto the lower end of a sloping perforated table. Air is forced up through the porous deck surface and the bed of seeds by a fan, which stratifies the seeds in layers according to density with the lightest seeds and particles of inert matter at the top and the heaviest at the bottom. An oscillating movement of the table causes the seeds to move at different rates across the deck. The lightest seeds float down under gravity and are discharged at the lower end, while the heaviest ones are kicked up the slope by contact with the oscillating deck and are discharged at the upper end. This machine separates seeds of the same density but of different size and seeds of the same size but of different densities.

Step-6: Seed Treatment

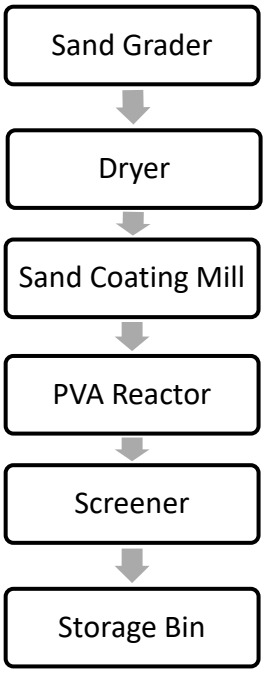
Seed Dressing

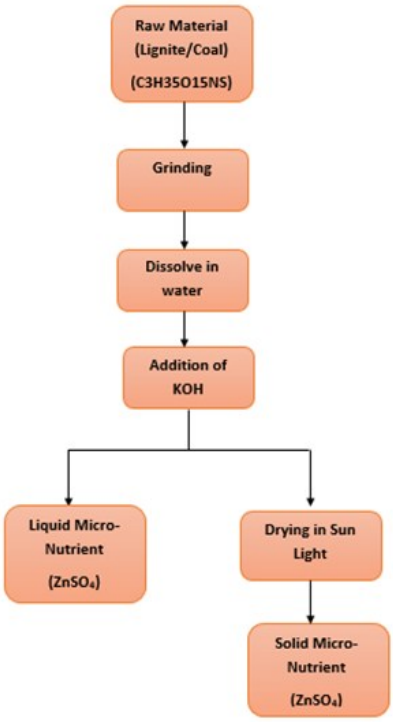
In this method the seed should be dressed with either a dry formulation or wet treated with a slurry or liquid formulation. In this process seeds are spread on a polythene sheet and required quantity of chemicals should be sprinkled on seed surface and mixed mechanically.

Step-7: Packaging of seed

After seed treatment it is important to package seed in dry containers for proper storage.

Flow charts of process activities for Formulation of micronutrients and Pesticides:





Finished Product

Finished product obtained from the project activities includes pesticides such as:

- Emamectin Benzoate
- Lambda Cyholothrin
- Chlorpyriphos
- Bifenthrin
- Mezotrin
- Atrazine
- leufenuron and

Micro fertilizers such as Br, Bio Stimulant, Zn, Potash, Np, Bop, Crop Supplements, Humic Acid and sulphur.

Water Consumption & Wastewater Disposal

The Breakup of water requirement and wastewater generation during construction phase of project are given in Table 2.2

Table 2.2: Water Requirement and Wastewater Generation during construction

Sr. No.	Description	Water Consumption (gallons/day)	Wastewater Generation (gallons/day)	Mode of Disposal
1	Domestic	1670	1345	Will be disposed off in Main Drain after proper treatment through septic tank.
2	Construction and sprinkling	2000	-	-

Solid Waste

In constructional phase all waste materials such as landscape and land clearing debris, gravel and aggregate products, concrete, masonry scrap and rubble (brick, concrete masonry, stone), and plastics and paper from cement bags will be recycled during the construction activities as road filling and maintenance purposes. Solid waste generated during construction phase will be placed in separate bins.

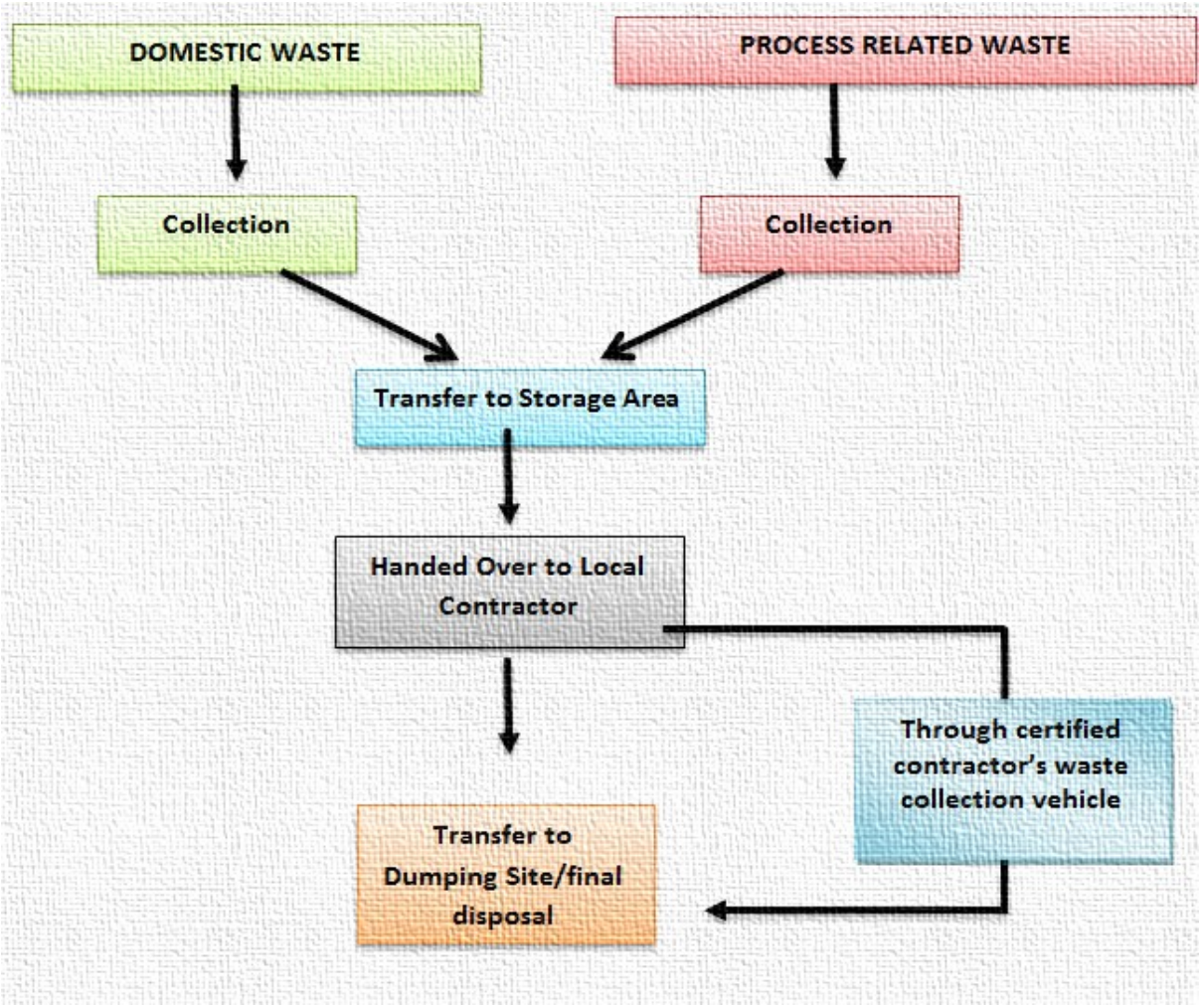


Figure 4: Solid Waste Detail

Health and Safety

A well-maintained health and safety plan will be established. It will assure the contractor will maintain all the safety measures in operational phase. In operation no activity is involved because 98% system is automated. Beside this safety mats, shoes, gloves all will be part of the work's dress.

Table 4: Details of PPEs

Protection	Occupational Hazards	PPEs
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.
Hearing protection	Noise, High sound	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials

Safety Signs/ Safety Boards

At any workplace Safety signs and symbols are very important to avoid many accidents. They must be in easy and understandable language to all the workers. Workers should have the knowledge of sign wordings and they must be trained and aware about them. Safety signs, symbols and boards must be provided by every site to protect the workers and employees from the risks of hazards that has not been controlled by other means. Safety signs and boards give safety message and they must be of different colors that workers could understand their meanings easily. At the subject project, safety signs and boards will be placed to avoid the workers and staff from any risk.

Plantation

Area for plantation will be reserved. Proper plantation will be done to control the suffocation and for the esthetic purpose.

Fire Protection System

An addressable fire protection system with detection and alarm annunciation and other installations etc. are provided to protect against any fire hazards in the project. Fire buckets and fire extinguishers will be installed at all sensitive places within the working area of project.

Restoration and Rehabilitation Plans

All possible precautions will be taken to prevent an untoward incident in terms of life and property losses. On completion of the project, solid waste will be removed from the site in order to maintain aesthetics of the area. All measures will be undertaken for ensuring occupational safety, security and clean environment during the working hours. Vegetation and landscaping will be done by the proponent after the completion of project.

Details of Restoration and Rehabilitation at the End of the Project Life

There will be no matter of rehabilitation as the site is already owned by the project proponent. At the end of the life of the project, it will be duly dismantled with special precautions to avoid/ minimize pollution and at the same time taking all safety precautions to protect human life and property around the building.

The materials capable of recycling/reuse will be either sold in the market or to be reused for other suitable purposes.

Government & Local Approvals:

The proponent is very purposive about the approval from all local and government bodies but NOC from EPA is prerequisite for approval from all these bodies.

CHAPTER # 3
DESCRIPTION OF ENVIRONMENTAL & SOCIAL BASELINE CONDITIONS

This section provides the description of baseline conditions of the Project as well as the area of influence. The existing environmental conditions of the proposed area of influence will also be a benchmark to be used for a comparison of before and after installation and operation of pesticide formulation. This baseline will also provide the datum for assessing the impacts and suggesting the mitigation measures, which will be implemented effectively at various phases of the Project activities.

Physical Environment:

Topography

Faisalabad is situated at the center of the lower Rechna Doab, the area is located between the Chenab and Ravi rivers. There is a mild slope from the northeast to the southwest with an average fall of 0.2–0.3 meters per kilometer (1.1–1.6 feet per mile). The city is situated at an elevation of about 183 meters (600 ft.). The topography is marked by valleys, local depression and high ground.

The soil of the area is fertile. Being situated about 91 km from Chenab River, the soil in the project area is rich alluvial loam (Punjab Agriculture Department). The sand extracted from the river bed is superior and is commonly used for building purposes.

Land Use

The land use of the Project Area is mainly industrial i.e. 90%.

Geology and Soils

The surface soil are grey to brown in color and medium textured i.e. silty clay/ clay loamy or sandy loam at the site, at all the locations and generally continues up to depth of 3-10 feet. This sub stratum contains fine sand. Topographically the area is almost plain.

The district of Faisalabad is part of the alluvial plains between the Himalayan foothills and the central core of the Indian subcontinent. The alluvial deposits are typically over a thousand feet thick. The interfluves are believed to have been formed during the Late Pleistocene and feature river terraces. These were later identified as old and young floodplains of the Ravi River on the Kamalia and Chenab Plains. The old floodplains consist of Holocene deposits from the Ravi and Chenab rivers.

The soil consists of young stratified silt loam or very fine sandy loam which makes the subsoil weak in structure with common kankers at only five feet. The course of the rivers within Faisalabad is winding and often subject to frequent alternations. In the rainy season, the currents are very strong. This leads to high floods in certain areas which do last for a number of days. The Rakh and Gogera canals have encouraged the water levels in the district however the belt on the Ravi River has remained narrow. The river bed does include the river channels which have shifted the sand bars and low sandy levees leading to river erosion.

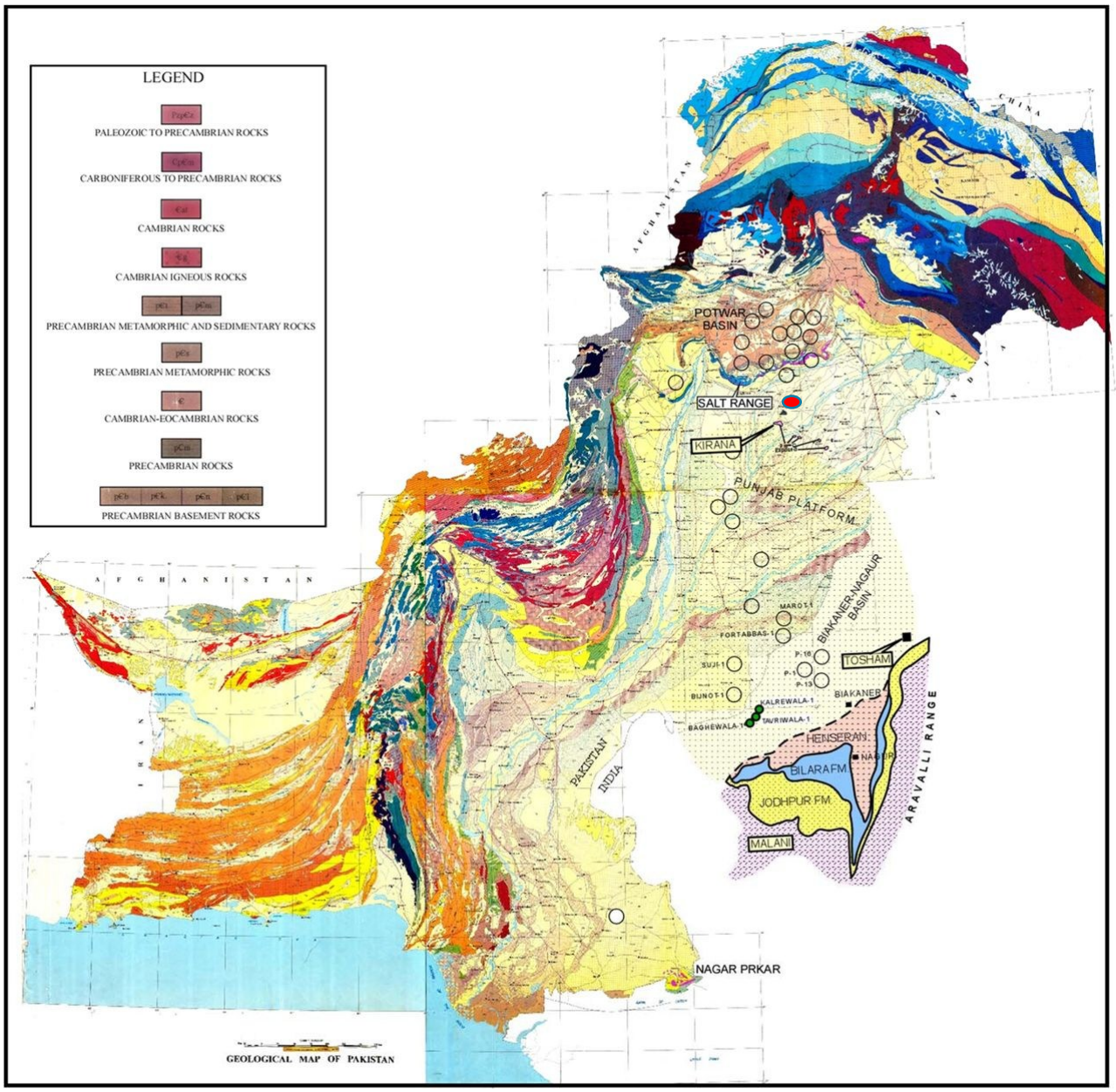


Fig 4.1: *Geological Map of Project Site*

Seismology

Earthquake is generated by tectonic process in the upper part of the earth called lithosphere, which is divided into several rigid parts called “Plates”. Due to the movements of these plates, stress build up takes place and result in the deformation of the crustal mass.

On the basis of Peak Ground Acceleration (PGA) values obtained through Pakistan Seismic Hazard Assessment (PSHA), Pakistan is divided into 5 seismic zones in line with the Uniform Building Code (UBC) 1997.

The boundaries of these zones are defined on the basis as shown in Table 4.1.

Table 4.1: Probabilistic Ground Acceleration (PGA) Values of Seismic Zones of Pakistan

Horizontal Zone	PGA (g)
1	0.05-0.08
2A	0.08-0.16
2B	0.16-0.24
3	0.24-0.32
4	>0.32

As per Building Code of Pakistan (BCP) 2007 (Seismic Provisions), the proposed Project falls entirely in the zone 2A, which is the regions of moderate seismic risk (Figure). Hence all the applicable provisions related to Soil and Foundations, Structural Design Requirements and with the Structural Concrete of BCP should be considered in the design of the structures.

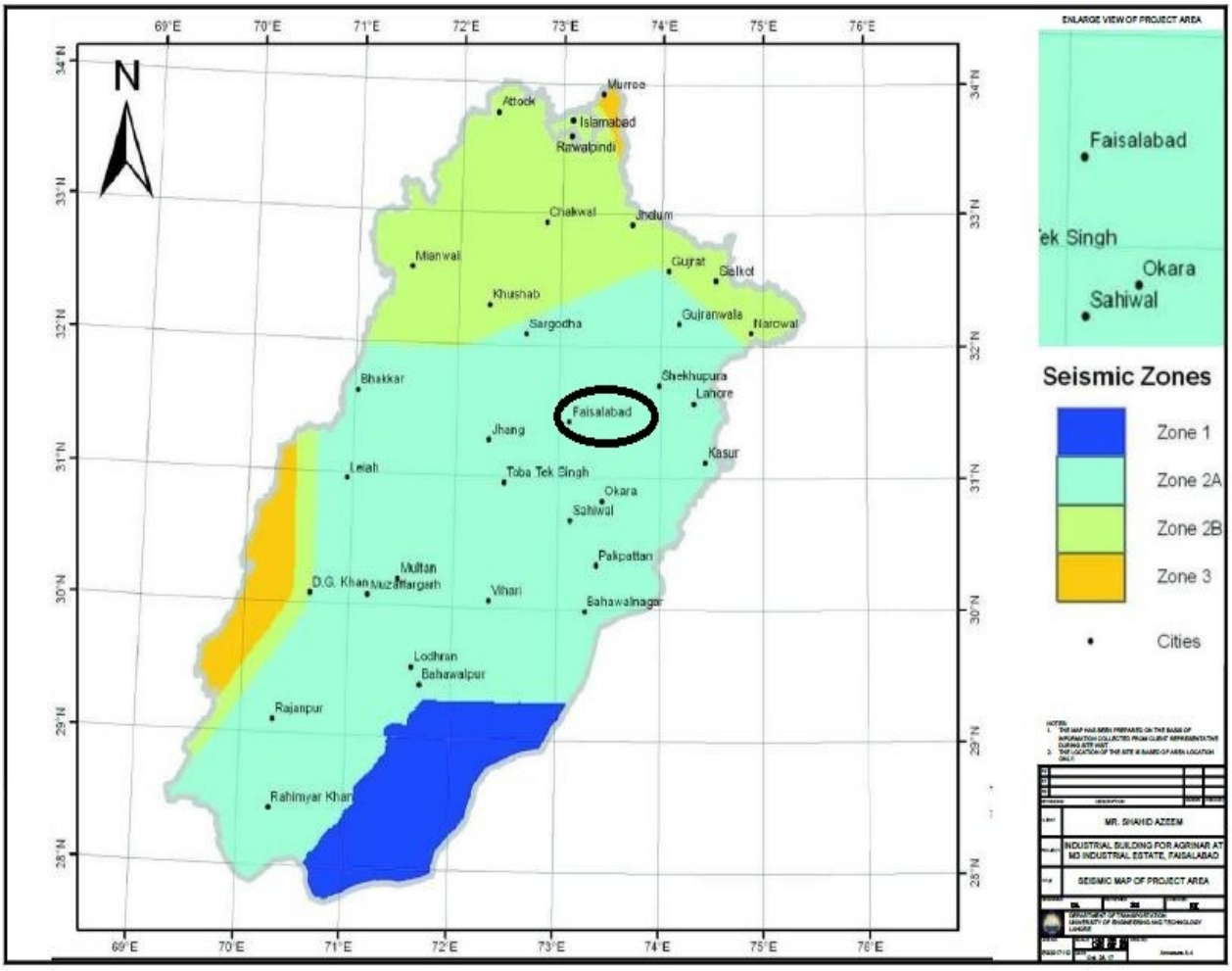


Fig 4.1: Seismic Map of Pakistan highlighting Project Site

Climate

The climate of the district is hot and dry during summer and cold and dry in winter. The mean maximum and mean minimum temperatures during summer are about 40oC and 28oC respectively. The mean maximum and mean minimum temperatures during winters are about 27oC and 6oC respectively. The highest mean temperature (39oC) from 1961 to 1990 was recorded in the month of May. Likewise the minimum mean temperature (8oC) was recorded in the month of January. The annual rainfall of the district is approx. 288.8 mm.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	26.6 (79.9)	30.8 (87.4)	37 (99)	44 (111)	47.5 (117.5)	48 (118)	46.1 (115)	42 (108)	41.1 (106)	40 (104)	36.1 (97)	29.2 (84.6)	48 (118)
Average high °C (°F)	19.4 (66.9)	22.2 (72)	27.4 (81.3)	34.2 (93.6)	39.7 (103.5)	41.0 (105.8)	37.7 (99.9)	36.5 (97.7)	36.6 (97.9)	33.9 (93)	28.2 (82.8)	22.1 (71.8)	31.6 (88.9)
Average low °C (°F)	4.8 (40.6)	7.6 (45.7)	12.6 (54.7)	18.3 (64.9)	24.1 (75.4)	27.6 (81.7)	27.9 (82.2)	27.2 (81)	24.5 (76.1)	17.7 (63.9)	10.4 (50.7)	6.1 (43)	17.4 (63.3)
Record low °C (°F)	-2.9 (26.8)	-1.4 (29.5)	1 (34)	7 (45)	13 (55)	17 (63)	19 (66)	18.6 (65.5)	15.6 (60.1)	9 (48)	2 (36)	-1.3 (29.7)	-4 (25)
Average precipitation mm (inches)	16 (0.63)	18 (0.71)	23 (0.91)	14 (0.55)	9 (0.35)	29 (1.14)	96 (3.78)	97 (3.82)	20 (0.79)	5 (0.2)	2 (0.08)	8 (0.31)	346 (13.62)

Water Resources

Surface Water

River Chenab and related canals are the major surface water source of project area. It is perennial and flows throughout the year. It also causes floods in the monsoon season, when it receives excessive rainfall water from upstream.

Ground Water

Irrigation is largely dependent on the canals, but tube wells have also been sunk in the areas where water is fit for irrigation. The chemical quality of ground water in the district varies area wise and depth wise. Irrigation supplies are perennial and tube wells have been installed to make up the deficiencies. The strata near project site is water bearing and alluvial deposits, giving groundwater potential throughout the project area and the water table is fairly near the surface at 13 feet. The water table is not seasonal and dug wells do not generally run dry, because the ground water aquifer is recharged by Chenab River and canals (flowing about 91 km western side of project site). The local population is generally reliant on installed hand pumps, electric motors and supply from tube wells. Near the current project site hand pump water was tested in the laboratory, the results reveal that the water quality of the area is under permissible limits with respect to biological and chemical parameters.

Ecological Environment

This section describes the biodiversity existing ecosystem and existing ecological conditions in the project area of influence. This section also enlists the fruit and non-fruit trees (forest trees), wildlife species and identifies those that need protection.

Flora

The area is located in alluvial plain which is highly fertile. Naturally grown shrubs are also present on the land. Jungli Kikar (Wild Acacia niloica), Sufaida (Eucalyptus), Aak (Calotropis), Sheesam (Dilbergia Sisso) and Jandh (Prosopis cineraria) were seen on the project land. Orchards of Citrus, Guava and Mango fruits are found in abundance in the surroundings of the project area. Besides Dates, Pomegranate and Bananas are also grown in minor quantities in the district.

Fauna

Fauna within the Project area includes following:

(i) **Mammals**

Jackels (Canisaureus)
Foxes (SSP. Vulpes)
Field rats (Rattusnorvegitus)

(ii) **Reptiles**

House Lizard

(iii) **Amphibians**

Common Toads

(iv) Birds

Shikra (Accipiter badius)
Crow (Corvussplendens)
Common kite (Milbusmigrans)
Sparrow (Passer domesticus)
Pigeons (Columba livia)
Dove (Stratopielia SSP.)
Parrot (Psittaculakramerl)

(v) Others

Spiders

There are no migratory birds reported in or around the project area. Domestic animals of significance include cows/ bulls, buffaloes, goats, donkeys and sheep.

There is no endangered species reported in the project area by the Wildlife Department of Punjab.

Socioeconomic Environment:

General

This section deals with the social conditions of the Project Area. During the desk/ office study, available reports/ documents were comprehensively studied. During the field survey interviews with the residents,

shopkeepers, students, pedestrians, drivers, and hospital employees were held and observations were taken after giving due consideration to the desk/ office study results.

Demographics

Faisalabad was established as one of the first planned towns of British India covering an area of 3 square kilometers (1.2 sq. mi). It was initially designed to accommodate 20,000 people. The city's population increased from 69,930 in 1941 to 179,000 in 1951 (152.2% increase). Much of the increase is attributed to the settlement of Muslim refugees from East Punjab and Haryana, India. In 1961, the population rose to 425,248, an increase of 137.4%. Faisalabad set a record in the demographic history of Pakistan by registering an overall population increase of 508.1% between 1941 and 1961. The industrial revolution of the 1960s contributed to population growth. In 1961, the population was 425,248. A 1972 census ranked Faisalabad as the 3rd largest city of Pakistan with a population of 864,000. In a 1981 census, the population was 1,092,000; however, the Faisalabad Development Authority estimated the number to be 1,232,000.[69] In the 2017 consensus, the total population of the city was 3,203,846.

Religion

Islam is the common heritage in the region with a 97.22% Muslim majority according to the 1998 Pakistan census report and 2001 population data sheet. Islamic influences are evident in the fundamental values of various inhabitants including cultural traditions, marriage, education, diet, ceremonies and policies with may reflect stark differences in rural villages as compared to urban areas. People live in tight-knit joint families, although a nuclear family system is emerging due to changing socio-economic conditions. Ancient Pakistani culture prevails in most marriage practices in the region, as do certain restrictions related to ethnicity and caste. Prevalent minorities, particularly Hindu and Christian, feel a sense of vulnerability because of their religious beliefs.

Public Transport

Faisalabad is well-connected by rail, road and air. Public transportation in Faisalabad includes auto-rickshaws, buses and railways. Faisalabad International Airport is located on the outskirts of the city, and operates flights to the Middle East.

Railways

The Faisalabad railway station is the central railway station in the city. The railway line forms part of the Khanewal–Wazirabad railway line. Rail services are operated by Pakistan Railways, owned and operated by the Ministry of Railways.

Cargo Express services are operated by Pakistan Railways which runs from Karachi to Faisalabad via Multan. Twenty-seven bogies comprise the goods train, and are handled respectively by private contractors at the station. The station has a special cargo facility operated by the Ministry of Railways (Pakistan) for handling

various goods from the city to other regions of the country. An express parcel service runs from Karachi to Lahore via Faisalabad.

Industrial Importance

The Faisalabad Chamber of Commerce and Industry monitors industrial activity in the city and reports their findings to the Federation of Pakistan Chamber of Commerce and Industry and provincial government. The city has a major dry port and international airport.

Faisalabad is recognized as the center of the textile industry in Pakistan, contributing to half of Pakistan's total textile shipments. At the end of June 2012, textile mills employed 20% of the nation's workforce, and generated 1.3 trillion rupees ($13.8 billion) in textile products, most of which were exported to the US and Europe. While Punjab's economy is driven primarily by agriculture, the textile industry along with leather products and light engineering goods play an important role, with more than 48,000 industrial units spread across Punjab. In an effort to boost bilateral trade, Romania and Turkey have honorary-consulates in Faisalabad which enable trade links with the city.

The Faisalabad clock tower and its eight bazaars (markets) remain a major trading zone in the city. Each of the eight bazaars has a special name and is known for selling certain goods as follows:

- Katchery Bazaar, named for the court (Katchery) is known for its mobile phone and accessory market.
- Rail Bazar is a gold and cloth market.
- Bhawana Bazaar supplies electrical and electronic goods.
- Jhang Bazaar supplies fish, meat, vegetables and fruits.
- Aminpur Bazaar supplies stationery and interior décor.
- Kharkhana Bazaar is known for herbal medicines.
- Gol Bazaar contains dry fruit, as well as wholesale soap, oil, and ghee shops.
- Chiniot Bazaar is known for allopathic and homoeopathic medicinal stores, cloth, blankets, sofa cloth, and curtains. It also has poultry feed wholesale shops.
- Montgomery Bazaar (also known as Sutar Mandi) is known for yarn and raw cloth trading.

CHAPTER # 4
POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

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

Impacts are assessed by analyzing their magnitude and sensitivity. The sensitivity and magnitude of the impact are described with reference to legal requirements, accepted scientific standards or accepted impact assessment practice, and/or social acceptability; where possible.

But where no known published 'standard' criteria exist for determining the magnitude of effects, established professional criteria and best practice techniques are used.

Methodology for Impact Evaluation:

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

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 1 and 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact (1 represents the least magnitude, and 10 the greatest). Likewise, a number between 1 and 10 is placed in the lower right-hand corner to indicate the relative importance of the impact (again, 1 represents the least magnitude and 10 the greatest).

Table 5: Scale Table of Importance & 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

For the evaluation of this project, each action checked was evaluated in terms of magnitude of effect on environment characteristics and conditions [on the vertical axis]. From upper right to lower left across each block where significant interaction is expected slash \was placed diagonally. The most important blocks marked are evaluated individually, and a number between 0 to10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact 1is the best magnitude, and 10 the greatest magnitude. In the same way, a number between 0 and 10 in the lower right-hand corner to indicate the relative importance of the impact again, 0 is the magnitude, and 10 the greatest.

The next step is to evaluate the numbers which have been in the slashed boxes. The high or low numbers on any one box indicates the degree of impact of the appropriate action on the given characteristic of the environment. The assignment of magnitude and importance numbers is based, to the extent possible, on factual data rather than on the evaluator's preference.

For the rating design regarding the probable impacts requires the evaluator to quantify his\her judgment. The rating scheme\scheme allows the reviewers to thoroughly follow the evaluator's line of reasoning, to aid in identifying points of agreement and disagreement. In fact, matrix is the abstract for the text of the environmental impact assessment

Table 6: Leopold Matrix

Magnitude / Importance			Transportation of raw material	Operation of generators	Water consumption	Wastewater generation	Storage of raw materials	Social activities	Public welfare	Economic activities	Employment	Infrastructure improvement	Total Score of Impact	Average Score of Impact
PHYSICAL	Soil	Soil Quality	2 / 1	0 / 0	1 / 1	5 / 2	4 / 2	1 / 1	0 / 0	1 / 1	0 / 0	4 / 5	18 / 13	1.8 / 1.3
		Erosion	2 / 1	0 / 0	1 / 1	3 / 2	2 / 2	2 / 1	0 / 0	0 / 0	1 / 1	3 / 4	14 / 12	1.4 / 1.2
		Geomorphology	0 / 0	0 / 0	0 / 0	3 / 3	2 / 1	0 / 0	0 / 0	2 / 1	3 / 2	4 / 6	14 / 13	1.4 / 1.3
	Water	Surface Water	0 / 0	0 / 0	2 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0	0.2 / 0
		Subsurface Water	1 / 2	0 / 0	1 / 1	6 / 7	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	3 / 3	12 / 14	1.2 / 1.4
	Air	Air Quality	2	4	0	2	1	2	0	0	1	7	19	1.9

			1 /	4 /	0 /	3 /	1 /	1 /	0 /	0 /	1 /	7 /	18 /	1.8 /
		Odors	1 / 1	1 / 1	0 / 0	5 / 7	2 / 3	1 / 1	0 / 0	0 / 0	1 / 1	0 / 0	11 / 14	1.1 / 1.4
		Noise	5 / 6	7 / 8	0 / 0	2 / 2	4 / 3	5 / 0	0 / 0	6 / 8	4 / 6	4 / 7	37 / 40	3.7 / 4.0
BIOLOGICAL	**Fauna & Flora**	**Crops**	1 / 2	3 / 2	2 / 3	4 / 6	2 / 2	2 / 3	4 / 3	4 / 3	3 / 3	3 / 3	28 / 30	2.8 / 3.0
		Birds	1 / 2	6 / 5	0 / 0	4 / 4	1 / 1	7 / 6	0 / 0	4 / 3	3 / 4	4 / 4	30 / 29	3.0 / 2.9
		Mammals	2 / 3	1 / 2	2 / 1	4 / 3	0 / 0	2 / 1	0 / 0	3 / 3	2 / 1	1 / 2	17 / 16	1.7 / 1.6
SOCIO-ECONOMIC	**Social**	**Industrial**	4 / 4	4 / 5	4 / 6	6 / 7	4 / 5	6 / 6	5 / 6	7 / 7	9 / 9	7 / 7	55 / 61	5.5 / 6.1
		Recreational Use	2 / 1	2 / 3	3 / 3	3 / 3	1 / 1	3 / 4	4 / 4	2 / 3	2 / 1	4 / 3	26 / 26	2.6 / 2.6
		Historical / Cultural	2 / 2	2 / 2	2 / 1	4 / 4	0 / 0	3 / 2	1 / 1	2 / 2	3 / 4	2 / 2	19 / 19	1.9 / 1.9

Impact Analysis and Prediction:

In order to evaluate the socioeconomic and environmental impacts, field 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. 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.

To identity the different types of stakeholders and ascertain their perceptions about the project, an environmental examination 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.

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, Govt. offices, shops, etc. near the Project area:

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

Characteristics of Impacts:

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

Table 7: Impact Assessment criteria

Rating of Consequence of Effect on Environment	Rating of Frequency of Occurrence				
	A. Very low: Not heard of but could occur	B. Low: Has occurred in other industry	C. Medium Has occurred in oil and gas industry	D. High: Occurs several times a year in oil and gas industry	E. Very high: Occurs several times a year in PDO
Slight effect: Local environmental damage. Within the fence and within systems. Negligible financial consequences	LOW RISK				
Minor effect: Contamination. Damage sufficiently large to attack the environment. Single exceedence of statutory or prescribed criterion. Single complaint. No permanent effect on the environment.		MEDIUM RISK			
Localized effect: Limited loss of discharges of known toxicity. Repeated exceedence of statutory or prescribed limit. Affecting neighborhood.					
Major effect: Severe environmental damage. The company is required to take extensive measures to restore the contaminated environment to its original state. Extended exceedence of statutory limits		HIGH RISK			
Massive effect: Persistent severe environmental damage or severe nuisance or nature conservancy extending over a large area. In terms of commercial or recreational use, a major economic loss for the company. Constant, high exceedence of statutory or prescribed limits				EXTREME RISK	

Analysis of Impacts and Recommended Mitigations

The proponent aims to a establishing a manufacturing plant for production of pharmaceuticals. If the project proponent maintains HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment. 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.

Impacts during Operational Phase:

The positive and negative impacts of subject project, during its operation are discussed below:

Solid Waste/ Sludge Management:

Due to construction activities waste will be generated at construction and contractors camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and solid waste etc.

Impact

- Insecure and unhygienic disposal of the solid wastes generated at the worksite, particularly garbage and trash may cause degradation of 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
- Throwing away of solid wastes into water channels and the wastewater network can result into choking of the latter.

Nature of impact: Direct
Duration: Short term
Timing: Constructional phase
Reversibility: Not applicable
Likelihood: Moderate
Consequences: Moderate
Impact significance: Low, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- 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 and those which cannot be sold out (brick pieces) may be used as a filling material for leveling the depressions, subject to technical feasibility
- Solid waste generated during construction and camp sites will be safely disposed in demarcated waste disposal sites or handed over to the contractor

Wastewater

Impact:

Waste water will be produced only from construction activities

Nature of impact: Direct
Duration: Short term
Timing: Constructional phase
Reversibility: Not applicable
Likelihood: Low
Consequences: Mild
Impact significance: Low.

Mitigation measure

- Wastewater generated during construction and domestic activities will be stored temporarily in septic systems comprising of septic tanks from where it will be routed to local drain.
- 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 PEQS.
- Periodic cleaning of the septic tank is recommended.

Gaseous Emissions

Emissions will be produced by generators, and vehicles will similar to those produced by generators in terms of the resulting pollutants (SO2, NOX, PM, etc.). However, the extent to which they can produce would keep considerably lower, since much smaller engines will use in vehicles and construction machinery.

Nature of impact: Direct
Duration: long term
Timing: operation
Reversibility: irreversible
Likelihood: moderate if mitigation measures will be ensured.
Consequences: moderate, if pollutant levels in the ambient air will be control within acceptable limits by adopting proper mitigations.
Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation Measures

None of the potential effects discussed above will be exceeded to acceptable limits.
The mitigation measures given below used to reduce their impact, and ensure that they remain within acceptable limits.

- All equipment and vehicles during the operation of project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.
- Vehicle speed will be reduced on track passing through or close to shops
- Speed limits will be imposed and encourage more efficient journey management worked to reduce the dust emissions produce by vehicular traffic. Water sprinkling will be done where necessary.
- Management make sure process will be environment friendly
- Pollution abatement technologies regarding air pollution will be adopted in case of any air emission.

Energy Requirement

Energy consumption in industry 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
- Use energy saving products
- Do not leave the machinery in running form when there is no working being done
- Machinery must never be left unattended

It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase

Noise Level:

Noise is the major concern during the operation phase. It can be generated from the traffic on the road and from the machinery used for operations.

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:

- Machinery and vehicles will be tuned and maintained
- Limits will impose on unnecessary use of horns
- Safety signs will be displayed. public & drivers will be aware of them
- Sound proof wall will be constructed for generator.
- PPEs will be provided to workers where required.

Health and Safety

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 area. Mitigation measures will include:

Impact significance: Low to Moderate

Nature of impact: Direct

Duration: Short-term

Timing: Construction & operation

Reversibility: NA

Likelihood: moderate

Consequences: Moderate

Mitigation:

- Layout plan for site, indicating safety measures, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents. Industry is taking all measures emergency evacuation Plan is attached as ANNEXURE-H.
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines
- Provision of protective clothing for laborers handling hazardous materials, e.g. helmet.
- 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

Natural Vegetation

Project activities will not impose any potential impact on the area's natural vegetation and plantation.

A significant impact can be caused due to the unnecessary or excessive removal and burning of plants for fuel wood.

Nature of impact: Direct

Duration: long term

Timing: construction phase

Reversibility: irreversible

Likelihood: moderate

Consequences: Mild, as no rare plant species were present in the areas.

Impact significance: significant

Mitigation Measures:

The following mitigation measures will reduce the impact on vegetation:

- Prohibition to park vehicles on green belts/ grass;
- Unnecessary damage to vegetation is strictly avoided;
- Proponent planted trees and other species after construction phase.

Potential Environmental Enhancement Measures

The project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during Operational phase of the project:

- Sprinkling of water will be done on dusty roads and tracks.
- PPEs will be provided during construction & operational activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will 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 would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Air pollution controlling devices will be installed (If required) within the project during operation.
- Machinery will be kept maintained.
- Proper SOPs will be followed with proper schedule along with the HSE conditions.
- Solid waste will be handed over to contractors and agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.
- Firefighting equipment's and system will be installed.
- Safety signs will be placed at all locations where required.
- Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
- First aid facilities will be made available.

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, water and noise pollution. Other impacts are of minor importance. These impacts may arise during Construction & operational phase of the project so they will not cause any major harmful impacts on the environment and during the operational phase of the subject project, they may cause the issues of air, water and noise pollution if proper precautionary measures to avoid this pollution will not be taken but it will be ensured that precautionary measures will be adopted prior to start the activity, 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 constructional and operational phase of the project if proper precautionary measures and procedures will not be followed. If proper precautionary measures and procedures will be implemented, there will not be any major problem. If any impact would arise due to the subject project activity, it will be addressed on site. Trainings will be conducted on site prior to start work 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. HSE team for the implementation of EMP will be responsible for addressing such problems if arise. They will assess any impact that could be arisen during both phases and they would also be responsible to address the problem and to mitigate it.

Whys of Achieving Mitigation Measures?

By changing in planning and design

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

Improved monitoring and management practices:

Management shall take appropriate measures to provide pollution free and safe environment during the project activity by implementing improved management practices and monitoring techniques suggested in EMP.

Replacement, relocation and rehabilitation:

Subject project site is not the property of the government, there is no need of replacement or relocation of a single person or economic activity. Management has developed Restoration/ reclamation or tree plantation

plan to restore the project area after the construction phase of the project. Maximum Plantation will be done with native species within and outside the premises of the industrial estate, along the boundary wall and road side if directed.

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:
    a. Ensure the complete implementation of all mitigation measures.
    b. Ensure the effectiveness of the mitigation measures.
    c. Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
    d. 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 HSE/ Quality Manager of relevant qualification. HSE/ Quality Manager will act as Environmental Manager and will manage all HSE conditions at the PEQS.

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
- In-Charge Administration
- Supervisor of project

Training Schedule

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged during the constructional phase of the project. It will be imparted by a team of experienced trainers.

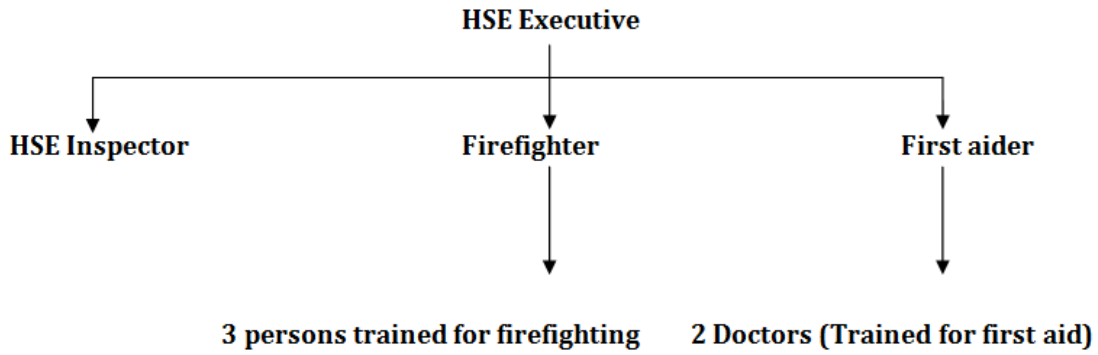


Figure 8: Institutional Capacity for the implementation of EMP

Management have an appoint HSE officer to initiation of constructional work at the project site. HSE officer is responsible for conducting the training of the labor, which will be organized either by the management of industry or by the contractor. Following schedules of training will be implemented:

Table 8: Training Program

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

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

The HSE/Quality 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.

HSE/Quality Manager will conduct Training on monthly or quarterly basis regarding health & safety, hygiene, firefighting and first aid.

Training of Building Contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme.

TORs will be including the training and submission of reports in the following area:

1) Handling of Machineries in a safe way
2) Use of PPEs
3) Maintenance of vehicles and submission of Environmental Monitoring Reports
4) Maintenance of Water Consumption records
5) Testing of water and waste water and submission of Environmental Monitoring Reports
6) Placement of safety signs/boards during construction
7) Sprinkling of water on the roads and dusty tracks
8) Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

Equipment Maintenance Detail

The proponent of the subject project will maintain records for Health, Safety & Environment and hired HSE coordinator to check and deal with the environmental issues.

All mobile equipment is to be inspected and maintained according to the following Equipment Inspection Schedule as a minimum. Records of all inspections and maintenance are completed and maintained for review and approval.

Table 9: Machinery Detail

Details of Machinery and Maintenance Details		
Sr. No.	**Equipment Description**	**Maintenance Schedule**
1	Sand Grader	As per Requirement
2	Sand Dryer	As per Requirement
3	Sand Weighing Scale	As per Requirement
4	Sand Coating Mill	As per Requirement
5	Final Dryer with Small Burner	As per Requirement
6	Screening	As per Requirement
7	Final Packaging Machinery	As per Requirement

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 will allocate 10% of total cost i.e. 177,000,000 of the project as Environmental Budget for meeting the following purposes:

Table 10: Allocation of Environmental Budget

HSE training	On quarterly basis
For Emissions control	As per requirement
Maintenance and management of environment	On regular basis
Maintenance of equipment	On regular basis
Restoration	As per requirement
Plantation	During the operation phase
Availability of PPEs	During construction and operation

Strategic planning to cope with any emergency	As per policy
Formulate the disaster management plan to cope with natural disaster	As per policy

Table 13: Cost Breakup for Project

Cost Breakup for Project/Year			
Sr. No.	**Description**	**Cost Estimated (PKR)**	**Comments**
1	Land	270 Million	Owned by Agrium Enterprises
2	Construction + Machinery + Civil Work	1500 Million	Owned by Agrium Enterprises
Total Cost =		1770 Million	

Environmental Management Plan for Agrium Enterprises.

Sr. #	Aspects	*Environmental Impacts/Mitigation Measures during Construction Phase*			
		Impacts	**Mitigation measures Construction Phase**	**Responsibility**	**Monitoring**
Land acquisition for the proposed project					
1	Land acquired for the subject proposed project	Nil	The site proposed for the subject project is the property of the proponent.	Proponent	Environmental Consultant/ EPA PUNJAB
Land use & soil erosion					
2	Land Use & Soil	Particulate Matters (PM) pollution, Clearing of the vegetation Scarring of the landscape and aesthetic beauty. Clearing of native plants will disturb the complexity of the ecosystem of the proposed area. Dust emissions will be generated during the construction. Flue gases will be generated due to the involvement of generators and other machinery.	Measures will be taken to avoid soil erosion and dust pollution. Restoration and reclamation plan will be developed to restore the natural landscape of the area. Plant nursery, garden will be developed to rehabilitate the native plants of the area. Project proponent will make all possible efforts to limit the impact on flora and fauna. The Management has serious concern and will take measures to preserve the environment and natural aesthetic beauty of the site.	HSE Department	Environmental Consultant/ EPA PUNJAB

Ambient Air Quality					
3	Air Quality	Particulate matter and fugitive dust emissions. Dust emission due to vehicles on un-metaled roads. Dust due to Construction. Dust raised on dirty tracks by project-related vehicles. Dust emission during earthwork Gaseous emissions from the vehicles & generators Air pollution due to site visiting vehicles/ transporting trucks, hauled trucks, machinery.	Sprinkling of water is recommended on dusty roads and unpaved tracks to control the generation of dust and PM. Air emissions control devices must be installed to control the air pollution. Water the construction site periodically to minimize fugitive dust generation while laying foundation. During excavation works drop heights will be minimized to control the fall of materials reducing dust escape: Temporary cover may be provided for earthwork if necessary. Vehicle emissions inspection should be done on regular basis. Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter. Vehicles/ trucks should be serviced regularly. All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.	HSE Department	Environmental Consultant/EPA PUNJAB

Noise & Vibration					
4	Noise	The major sources of the noise at site are project related machinery. High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mental disturbance. Noise level will not exceed 75 dB (A) at the distance of 2 km radius, project site is located at a safe distance from the nearest human settlements. Noise from construction activities from site preparation, earth works, foundation and plant equipment installation.	Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff of the subject project. Proper maintenance and tuning of the vehicles should be done. Sound proof room should be built for generator (if any) to control the noise. A speed restriction of 40 km/h will be imposed on all construction vehicles. Monthly monitoring is recommended by EPA certified lab to check the compliance with PEQS as per EPA PEQS Rules 2001. Noise level monitoring was conducted at different location and results are attached as Annexure-G with the report.	HSE department	Environmental Consultant/ EPA PUNJAB

Soil Contamination					
5	Soil contamination	Soil contamination due to waste water generated from the project activities	Soil contamination must be controlled by adopting mitigation measures under paved area, by maintaining leakage record of construction vehicles, and by regular inspection (admitted by proponent). Waste water treatment facilities should be installed during construction and operational phases of the project to treat the wastewater. Water from the treatment facility must not be injected into the sub soil. Tarpaulin sheets should be placed under generators and other leaching substances Treated water will be used for plantation.	HSE Department	Environmental Consultant/ EPA PUNJAB

Health and safety					
6	Health and safety	Health & safety issues of workers and nearby community	Trainings of the workers is recommended for health & safety, first aid and firefighting. Proponent must provide First aid facilities to workers in case of any injury or accident. Safe drinking water must be provided to workers, staff, and poor people of the area. Water consumption records should be maintained. Provision of Proper PPEs must be ensured at workplace. Assembly point and exit points must be available at workplace. Electric wires, D.Bs must be kept covered & closed to avoid any electric hazards. Smoking or any drugs should be prohibited during working hours or performing work. Safety signs & boards will be placed at the time of construction activity. Security guards will be appointed at the construction site. At the time of construction and earthwork, fencing will be ensured for the area under the exploration. Further proper housekeeping and safety arrangements must be ensured at the subject project.	HSE Department	Environmental Consultant/ EPA
Waste Water					

7	Waste water	Minor generation of waste water from construction activity. Water Contamination due to improper storage of construction material, Water contamination due to improper debris disposal, Waste water pollution, Spread of diseases, underground water contamination	Waste water generated from the constructional activity will be used as sprinkling on the dusty tracks or for restoration of the land. Waste water monitoring is recommended on monthly basis. Waste water treatment facility is recommended. After the treatment in wastewater treatment facility, water will be disposed off in the wastewater drain present near the project site. Waste water treatment plant details has been attached in Annexure - L	HSE department	Environmental Consultant
Solid waste generation					
8	Solid Waste Generation	Land & soil contamination, aesthetic degradation, foul smell etc. Solid waste generation from the construction activity, domestic and project process sources	A solid waste management division will be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. Constructional waste must be utilized for road filling or maintenance purposes. Project related solid waste should be handed over to contractors. It is recommended to adopt proper waste management system. Industrial ecology practice will be adopted wherever applicable and possible. 7 R's of sustainability is recommended.	HSE Department	Environmental Consultant/ EPA PUNJAB
Odor					

9	Odor	There will be no source of odor from construction phase of the project	Nil	NA	
Energy requirement					
10	Energy requirement	Resource depletion	Use energy efficient machinery and equipment 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 It is recommended to save and conserve the energy and adopt energy efficient technologies during the construction phase	HSE Department	Environmental Consultant/ EPA PUNJAB
Socio economic impacts					
11	Resettlement	Resettlement issues	The proposed area under the investigation is devoid-off any human settlement and it is the property of the government.	NA	NA
12	Language	Change in cultural language	Maximum employment of Local people is recommended to preserve the local cultural language. It will help in communication with the local people to resolve any emerging issue near the project area	Proponent	NA
13	Education	Change in social behavior and economic gains	School and colleges exist in the area. The project proponent will initiate an educational awareness program with the coordinator of the local people.	Proponent	NGO survey

14	Health	Social performance of the individuals in the area	The project proponent will assist the local impacted community for the improvement of health services	Proponent	Proponent
15	Culture and norms of the area	Change in culture by the influx of nomadic people	Maximum local employment should be ensured to preserve the culture of the area	Proponent	NGO survey/Environmental Consultant
16	Sewage and waste disposal	Diseases caused by improper sanitation	Subject project will uplift the economic status of the nearest human settlements. Awareness program will be initiated regarding the disposal of waste.	Proponent/ local NGO	NGO survey/ Environmental Consultant

Sr. #	**Aspects**	*Environmental Impacts/Mitigation Measures during Operational Phase*			
		Impacts	**Mitigation measures Operational Phase**	**Responsibility**	**Monitoring**

Ambient Air Quality					
1	Air Quality	No burning processes are involved during the pesticide formulation. So no significant gaseous emissions are expected to be produced during the process as defined in the Punjab Environmental Quality Standards (PEQS). However, the process of pesticide formulation are producing significant amount of odor. The company is also dealing with the sand granules and these granules are the cause of dust for the workers.	The project has the facility to control odor production due to pesticide formulation. There is one fume scrubber installed by the proponent. The facility has been provided proper ventilation mechanism through building design. Company has dust sucking hoods to control the spread of dust produced from granulation and other processes	HSE Department	Environmental Consultant/EPA PUNJAB
Noise & Vibration					

2	Noise	Operation of Pesticide formulation equipment and generators would be a cause of noise within the working area and could surpass the Quality Standards (PEQS).	Proper maintenance of machinery and the installation of canopy over the generator to avoid excessive noise would be made available. All machinery will be fully grouted and equipped and keep in closed hall. So there will be no issue for the noise pollution at all at the project site. The workers will be provided with ear plugs and other personal safety equipment to avoid invoking of any health issues.	HSE department	Environmental Consultant/ EPA PUNJAB
Gaseous Emissions					

3	Gaseous Emissions	The movement of vehicles in and out of the premises carrying raw material and final products. The exhaust from transport vehicle and standby generator are the source of emissions of SOx, NOx, CO and CO2.	EURO II quality fuel shall be used in the vehicles, generators to avoid emission of lead. Vehicles, machineries with good conditions which fall on the quality standards shall be used to control the exhaust emission. Stack with scrubbers shall be provided to reduce emissions from the generators.	HSE Department	Environmental Consultant/ EPA PUNJAB
Waste Water					

4	Waste water	Wastewater generated due to domestic/commercial activities will result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	To tackle domestic wastewater and wastewater generating from cleaning activities, waste water treatment plant will be constructed.	HSE department	Environmental Consultant
Solid waste generation					
5	Solid Waste Generation	Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the Agrium Enterprises.	No specific solid waste is produced during the process. At the site, solid waste will be only domestic like paper, polythene bags etc. from warehouse comprise of rejected and damaged cartons, plastic bottles and polythene bags which will be collected by sanitary workers of that area (recyclables) and rest of the waste is disposed through a contractor.	HSE Department	Environmental Consultant/ EPA PUNJAB
Energy Conservation					

6	Energy Conservation	Excessive use of energy will exert more pressure on the already dwindling energy resources of the city/country.	The workers/employees will be encouraged to follow energy conservation strategies developed during operational phase. Machineries and equipment will be kept in good maintenance to avoid extra fuel consumption.	HSE Department	Environmental Consultant/ EPA PUNJAB
Oil Usage and Spillage					
7	Oil Usage and Spillage	Routine use of lubricants for oiling of machineries may cause respiratory problems to the workers.	Proper ventilation and Exhaust fans have been installed to control the accumulation of VOCs within the area. Workers would be allowed to have frequent breaks and RPEs (Respiratory Protective Equipment) during washing activity	HSE Department	Environmental Consultant/ EPA PUNJAB
Emergency/Fire Hazards					
8	Emergency/Fire Hazards	Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency exits for storage units and administration block have already been planned. Firefighting equipment will be provided and adequate trainings will be provided to tackle any situation of fire hazards. Call points at suitable locations will be installed.	HSE Department	Environmental Consultant/ EPA PUNJAB
Training of Staff					
9	Training of Staff	Unskilled personnel will not be able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism will be developed where the team will be responsible to communicate/report any illegal or hazardous situation to the team leader.	HSE Department	Environmental Consultant/ EPA PUNJAB
Groundwater Consumption					

10	Groundwater Consumption	The groundwater will be used for domestic at said project. Water storage will also be required for emergency response in case of a fire. Prolonged water consumption may in the long run lower/deplete the underground water table. This will be a permanent and moderate negative impact.	An effective 'Water Conservation Plan' will be developed and for domestic purpose water will be gained from ground water Following operational measures will be adopted for water conservation: • It will be made sure that all faucets, circulating pumps etc. do not leak and are in good repair; • Any leaking or dripping faucet, pump or toilet will be reported immediately; • All the utility bills will be kept in a safe place to track the consumption of water; and • Purchase and use of water-saving equipment will be practiced; • An effective residents' training program will be implemented about water conservation.	HSE Department	Environmental Consultant/ EPA PUNJAB

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

Table 11: Environmental Monitoring

Sr. No.	Parameters	Monitoring Schedules	Monitoring Duration
1	Ambient Air Monitoring	Regularly	As per requirement
2	Noise Level	Regularly	As per requirement
3	Water quality	Regularly	As per requirement

CHAPTER # 6
STAKEHOLDERS AND PUBLIC CONSULTATION

The consultation process with various stakeholders of ESPAK has been carried out to involve community and other stakeholders at earlier stages. Information dissemination during public consultation is fundamental to successful conclusion of the Project. This chapter describes the objectives and details of the consultative process adopted; its outcome and the conclusions drawn thereafter.

Public consultation has been done during the planning and design phases of the Project with Government departments, line agencies, NGOs and affected persons of the Project area; concerns and suggestions thereafter have been taken into account and included where appropriate. The consultative process to date has been effective in addressing the concerns over the Project Operational impacts.

Objectives of Consultation

Public consultation plays a vital role in studying the effects of any development project on stakeholders and in its successful implementation and execution. It affords an opportunity to exchange knowledge with those who as members of the society are concerned with the Project, immediately or remotely. Referring particularly to a Project related to environmental assessment, involvement of public is all the more essential, as it leads to better and more acceptable decision-making.

The objectives of the stakeholder and Public consultation conducted in Project Area were;

- To apprise the Project community and stakeholders about Project interventions and potential impacts,
- To record the community concerns and recommendations regarding the project;
- To address/incorporate those recommendations in the Project design to the extent possible and;
- To share the mitigation measures with the local communities.

Consultative Aspect

The project involves stakeholders from various segments of the society, who have direct or indirect interest in the developmental activity. The Environment and Social team have endeavored to hold consultative sessions with a number of prominent stakeholders (Project Proponent, Government departments, line agencies, NGOs and affected persons of the Project Area) to evince their views on the project and their opinions, suggestions, understanding on various issues and concerns. The consultations aimed specifically at:

- Dissemination of Project information through discussions, education and liaison.
- Eliciting the comments and feedback on the project.

- Documentation of information narrated by the stakeholders.
- Documentation of mitigation measures proposed by the stakeholders.
- Incorporation of public concerns and their addresses in the EIA/ EMMP.

Identification of Main Stakeholders

There are two types of stakeholders related to the project i.e. primary and secondary stakeholders. Primary stakeholders are those which are directly affected by the Project activities and secondary stakeholders are those which are affected indirectly.

The project does not have direct impacts on any individual; therefore, no primary stakeholders are identified. Secondary stakeholders are institutional stakeholders, which includes Project Proponent, local Government representatives, and Government officials of the relevant departments, NGO, general public, local residents, shop keepers, vendors, hospital owners/staff, teachers, pedestrians, and businessmen/traders of the city. The categories of the stakeholders who provided useful feedback, included:

- Project Proponent
- Government officials
- Environmental practitioners and experts
- Teachers/students
- Shopkeepers

All those stakeholders have different types of stakes according to their involvements in various aspects of the Project. The consultant tried to contact all the stakeholders and shared their views and concerns and also interacted with the community-based organizations that can support the community.

Meetings with Stakeholders

A series of consultation was carried out with stakeholders and general public Small Industrial Estate Faisalabad and nearby areas.

The purpose of this survey was to achieve the objectives of the consultation, highlight the main issues in the implementation of the project and finally propose mitigation measures. Open and close ended questionnaire was used to collect the views concerning the assessment survey. Scoping sessions and informal group discussions were also carried out with local residents and local government representatives regarding the project. The outcome of whole consultation process was very encouraging. The following issues were discussed during Informal Meetings with local representatives:

a. Brief Description of the Project
b. Current economic condition in the area

c. Suggestions for improvement in the current industrial system and all activities related to industry
d. Perceptions about the project
e. Perceived impacts of the project

The local poor people predominantly requested for unskilled and semi-skilled jobs during implementation of the Project. On the basis of the consultations so far, it appears that the Project will have no insurmountable environmental and social impact. The community generally supported the project

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Sr. No.	Agency / Department / Stakeholder	Date	Time	Representative	Apprehensions Raised	Suggestions
1.	Environmental Experts	11-01-2022	2:50 PM	Site Inspector Environmental	• The proposed Project is a good initiative taken by Agrium Enterprises; as it will provide job opportunities to the local residents. • Dust emissions due to the construction activities such as deep excavations, transportation of construction materials and use of construction machinery. • Health and safety issues may arise for local community and workers due to construction activities. • If tree cutting is involved then it should be avoided as much as possible.	• Agrium Enterprises shall ensure construction of Wastewater Treatment Plant for treating effluents • Agrium Enterprises shall use wet scrubbers and electrostatic precipitator (ESP) to remove fine particles, like dust and smoke, from a flowing gas to combat air pollution. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • Health and Safety Management Plan should be prepared and implemented to avoid health and safety issues occurring during construction period of the Project. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19 among workers and local community.

						• Solid waste produced should be properly managed and disposed of in identified designated areas. • Construction material should be removed as early as possible on the construction sites. • Proper barricading shall be provided along excavation sites to avoid accidents and casualties. • Community Development Programs shall be initiated by Agrium Enterprises to uplift social living standard of the local residents.
2.	The Responsible Authority	11-01-2022	3:00 PM	Assistant Director Wildlife	• The proposed Project is a good initiative taken by Agrium Enterprises as it will provide job opportunities to the local residents. • No Wildlife Sanctuary and game reserve falls in the study area. Therefore; there is no threat to wildlife species.	• Ensure that the staff and workers hired for construction activities shall avoid illegal hunting of wildlife species present in the study area. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19.
3.	Other Departments	11-01-2022	3:25 PM	Assistant Director Fisheries	• The proposed Project is a good initiative taken by Packages Limited;	• Agrium Enterprises shall ensure construction of Wastewater Treatment Plant for treating effluents

					as it will provide job opportunities to the local residents. • No fisheries are present in the area	• SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19.
4.	Proponent Environment Management Team	11-01-2022	2:57 PM	Manager Environmental Team	• The proposed Project is a good initiative taken by Agrium Enterprises; as it will provide job opportunities to the local residents. • No reserve forest is present in and around the study area.	• Provision in Client budget for tree plantation and its maintenance cost for three (03) years, for the trees that will be planted in and around the study area, as a compensation for the trees that will be bowdlerized and as an absorbent for air pollutants due to the implementation of the proposed Project. • Sheesham and Eucalyptus shall be suggested in the tree plantation plan for plantation with three (03) rows. • Ensure continuous sprinkling of water on daily basis in the Project area to reduce emission of dust particles. • SOPs related to COVID-19 issued by Government of Punjab should be implemented during construction period to avoid outbreak of COVID-19.

Analysis of Stakeholder Consultation

Sample Size

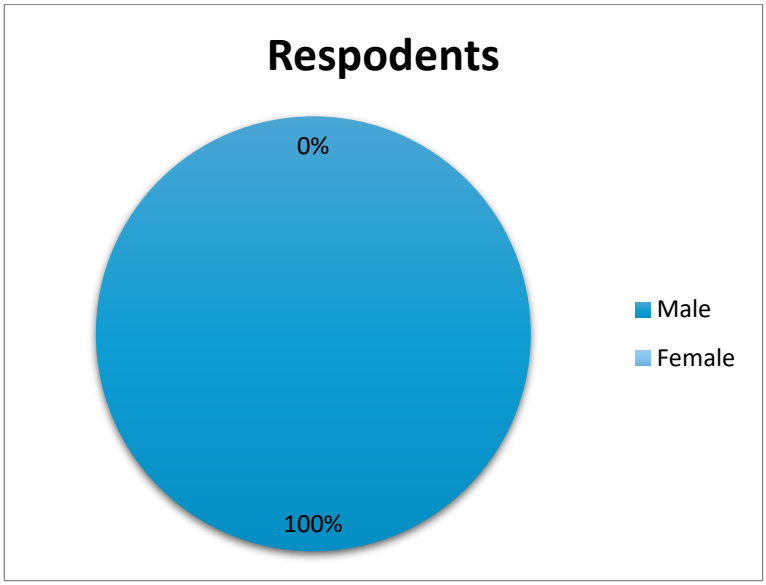
Sample size was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the respondents while most of them were not willing to give personal information.

Statistical Analysis

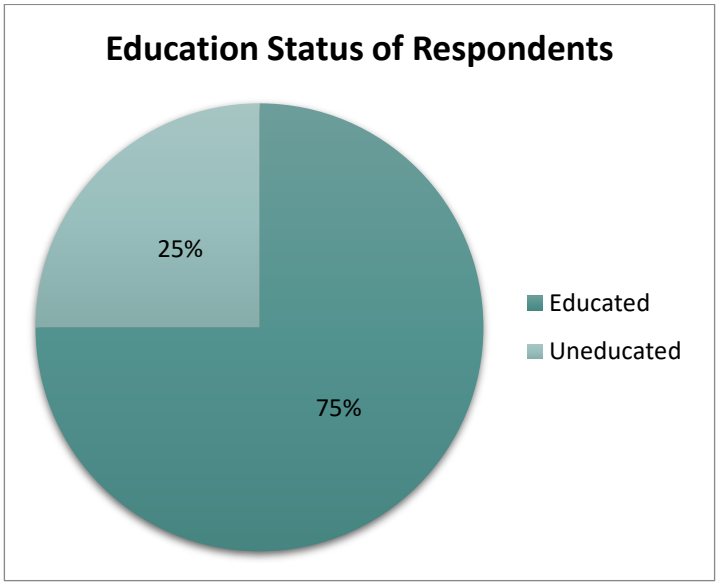
Statistical analysis of the data collected during the visit of study site villages through questionnaires.

These questionnaires (Stakeholder Survey Form with CNIC) are attached as ANNEXURE- J.

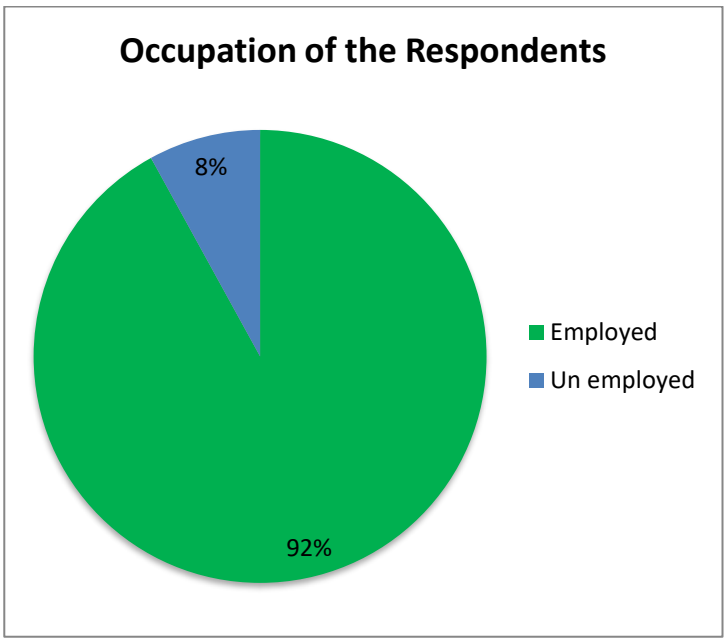
Result and Discussion



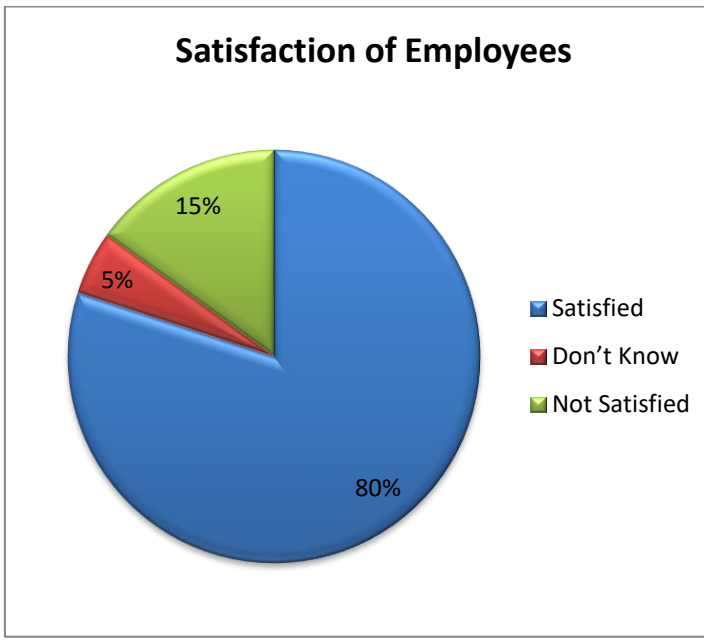
Gender Ratio of Respondents



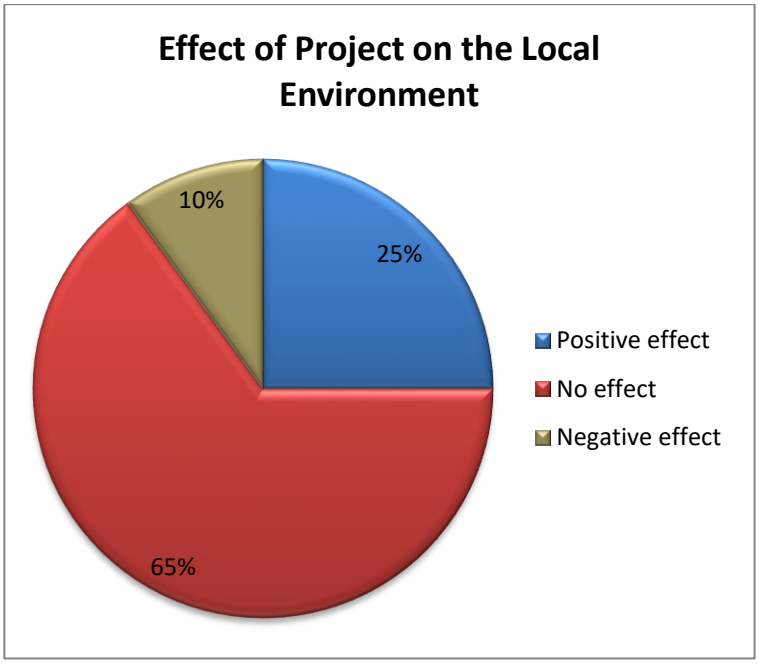
Education status of respondents



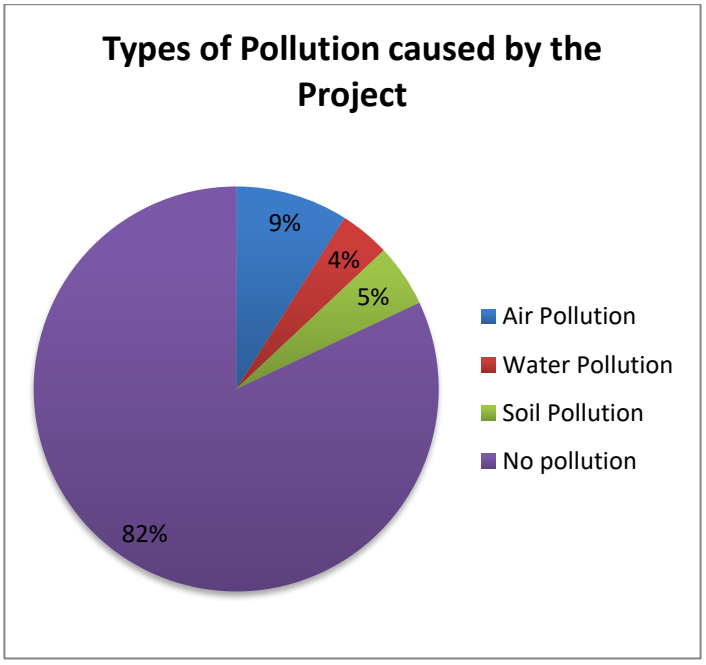
Occupation of respondents



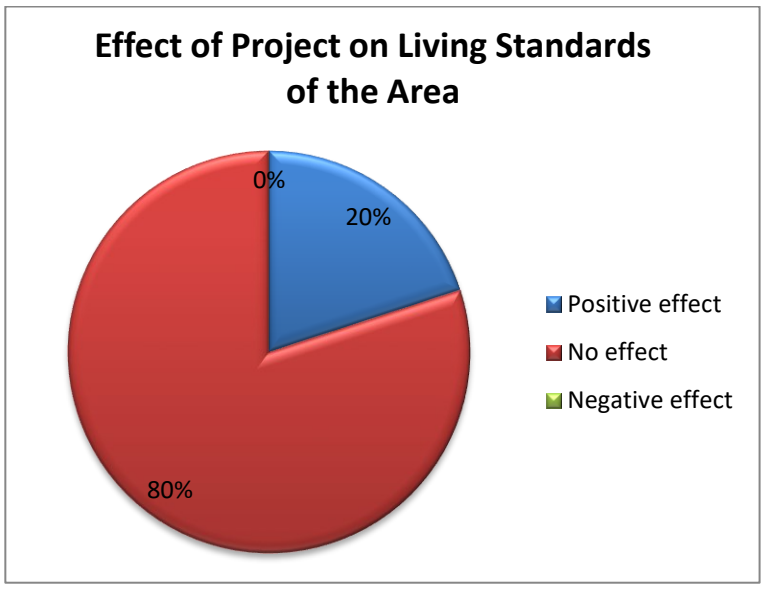
Satisfaction of respondents

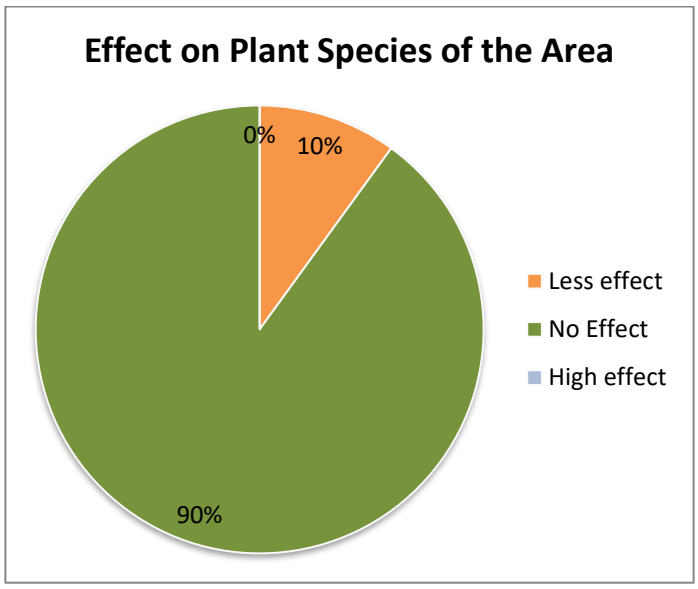


Effect of project on local environment



What type of pollution caused by project





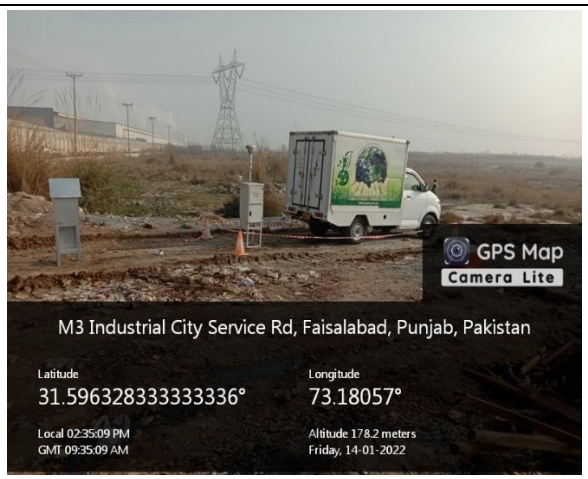
Effect of project on the living standard of area

Effect on plant species of area

According to graphical representation, 100 percent respondents were male while the numbers of females were 0 because the project area is industrial and no female is available on that site. 75 % respondents were educated while 25% were uneducated. So, according to the survey overall education status of the area is good.

As per survey, 80% people were satisfied with the project and they gave positive remarks regarding the existing unit and project as they got job over there, their living standard raise over working there. While 5% respondents were have no opinion regarding the project and 15% respondents were not satisfied with the production unit due to their concern regarding the aesthetic degradation and no preference to local people for jobs. Majority were in favor that no effect will produce by this project.

Ambient Air, Noise Monitoring and Drinking Water Sampling at Project Site

Ambient Air and Noise Monitoring at Project site	
	

Drinking Water Sampling in Project area





Summary of Issues Raised by Stakeholders

A summary of the key issues raised by stakeholders and how these are being addressed by Project Proponent is provided in Table below.

Table 12: Summary of issues and commitments by Proponent

Issue	Aspect/ Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job in executive level. Max .persons according to the requirement will be employed by the industry.
Training Opportunities	People are keen to consult with subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design. Installation of training facilities in for worker of the company and students will also be accommodate.

		The internship program will offer to the students to develop professional skills.
Health & safety	Health and safety issues may be arising due to industrial and constructional activity.	All possible safety measures will be taken during operation and construction phase. Agrium Enterprises has designated teams for HSE concern a.k.a. Emergency Response Teams (ERTs) and emergency equipment like fire extinguishers, spill kits, water hydrant system, effective use of PPEs and first aid are already well managed.
Local economy and business development	Local service providers are keen to participate in providing services to provide raw material and expect to receive in order to adjust their businesses to meet specific needs.	Proponent has main focus that they will all the material regarding construction to buy from the local market. This will help the local and small business and to people who are keen interested to become suppliers.
Environmental Issues	Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to nearby residents. Environmental degradation during construction.	Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. A Participatory Environmental Monitoring Program will be launched to spread awareness. Company also have certification of Environmental Management System (ISO-14001:2015).
Water quantity and quality	Water quality and quantity, and impacts from the wastewater disposal are all key concerns for nearby community.	Implementation of consultation in relation to water use, recycle and development of the Participatory Environmental Monitoring Program.

CHAPTER # 7
ANALYSIS OF ALTERNATIVES

This Chapter deals with the analytical overview of different alternatives that have been considered. The analysis has been carried out critically so as to justify the need of the Project and to select the most feasible alternative. Besides the economic viability; environmental sustainability and social soundness of the project has also been considered while analyzing different alternatives.

The No Project Alternative

A zero-alternative entail maintaining existing use to which the project site has previously been put to. This alternative would eventually evade any short-term potential negative impacts from project execution. To this end, any potential positive impacts envisaged during midterm and long-term project implementation will be missed.

Adopting zero alternatives would mean abandoning all the potential that the site offers to investor(s), contribution to government revenue and even local community livelihoods improvement.

Location Alternatives

To fulfill the industrial aspects of the project under reference of this EIA Report, it is to be sited at a place where processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act.

Modified Construction Technology Alternatives

The 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 and water 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 environmental friendly. Final design of industry and Machinery is based on latest available technology to produce high quality. These machines have pollution remove technologies built in. Therefore, it the best option to use that technology.

CHAPTER # 8
CONCLUSION & RECOMMENDATIONS

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 will provide the safe drinking water, safe working environment, proper training and first aid facility to all workers and staff. The project will generate additional jobs during construction and 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 will continue to assist the local communities as a corporate social responsibility (CSR).
- Any seepage and leakage will be controlled through proper mitigation measures.
- Sound proof room should be constructed for generator to control its sound (If required).
- Use of narcotics and smoking must be prohibited during working, filling or handling of fuel.
- PPEs must be provided to workers such as gloves, masks, ear muffs /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 will never be left in running condition.
- First Aid measures, health & safety Equipment (PPEs) will be provided to workers.
- Fire Fighting station & system will be installed.
- The management of subject project will assist the local communities as a corporate social responsibility.
- Jobs and employment will be 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.

REFERENCES:

- https://www.epa.gov/sites/production/files/2015-10/documents/njmc-wpp-2.pdf
- Schedule I of Punjab Environmental Protection Act 1997 (Amended 2012)
- *section 12 of Punjab Environmental Protection Act 1997 (Amended 2012)*
- Pakistan Environmental protection act 1997
- Punjab Environmental Protection Act 1997 (Amended 2012)
- Guideline for the Environmental Assessment
- Regulations of Environmental Assessment, Regulations 2000
- 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
- The Punjab local Governmental ordinance, 2001.
- Meteorological data from meteorological department and website
- Pakistan Biosafety rules 2005
- Pakistan Environmental agency (review of IEE/EIA) regulation 2000.
- Punjab Portal (http://www.punjab.gov.pk/attock)
- Faisalabad Chamber of Commerce Industries (https://fcci.com.pk/)
- Sectorial Guideline for environmental reports, industrial states
- Pakistan Environmental Protection ordinance (PEPO), 1983
- OSHAS 1800 for health and safety

GLOSSARY

Words	Dictionary
Mitigation	The action of lessening in severity or intensity
Legislation	law enacted by a legislative body
Compliance	Acting according to certain accepted standards
Flora	All the plant life in a particular region or period
Fauna	All the animal life in a particular region or period
Demarcated	Separate clearly, as if by boundaries
Screening	The display of a motion picture
Substitutions	An event in which one thing is substituted for another
Regulations	An authoritative rule
Stakeholders	A person or organization with an interest or concern in something
Vulnerable	Susceptible to attack