ENVIRONMENTAL IMPACT ASSESSMENT REPORT
M/S SAFI CHEMICALS & FERTILIZERS (PVT.) LTD
(Installation of Sulphur 80% WDG Plant)

Safi Chemicals & Fertilizer (Pvt.) Ltd.

Report Prepared by:

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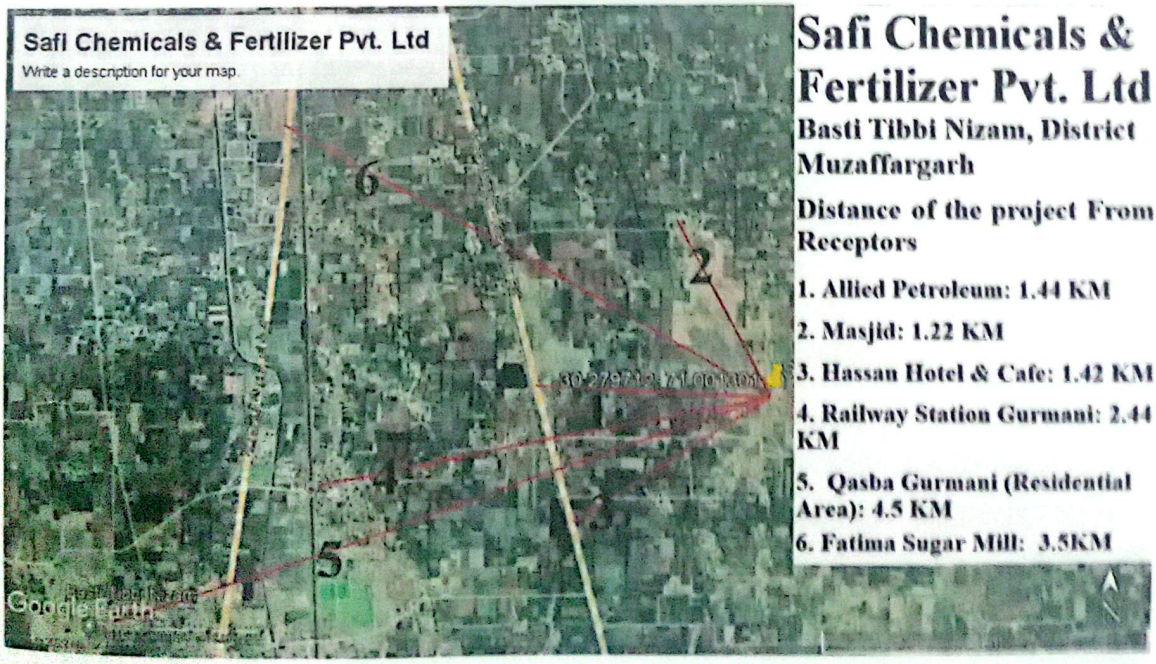
EXECUTIVE SUMMARY

M/s Safi Chemicals and Fertilizers (Pvt.) Ltd intend to extend its project with installation of Sulphur 80% WDG manufacturing unit at 5-KM Muzaffargarh Road, Habib Abad Sinawan, Tehsil Kot Addu, District Muzaffargarh, Punjab. M/s Safi Chemicals and Fertilizers (Pvt.) Ltd has obtained Environmental Approval Vide Letter No. DD (EIA) EPA /F-33 (EIA)/25042013/750 dated 08-052014 for construction phase of Sulphuric Acid and Single Super Phosphate Production. The Installation of Sulphur 80% WDG is the extension of the project in the same premises which already has got the Environmental Approval for construction phase of Sulphuric Acid and Single Super Phosphate Production at 5-KM Muzaffargarh Road, Habibabad Sinawan, Tehsil Kot Addu, District Muzaffargarh, Punjab. Environmental Impact Assessment (EIA) of the project has been conducted in accordance with the stipulations of Pakistan's environmental laws. The process and the results of the EIA are described in this document.

1-Title and location of the project

The title of the project is installation of Sulphur 80% WDG manufacturing unit at 5-KM Muzaffargarh Road, Habibabad Sinawan, Tehsil Kot Addu, District Muzaffargarh. The location of the project is 5-KM Muzaffargarh Road, Habibabad Sinawan, Tehsil Kot Addu, District, Muzaffargarh.



2-Name of the proponent

The name of proponent of the project is Mr. Zeeshan Habib

Contact Details	
Name	Mr. Zeeshan Habib
Designation	M/s Safi Chemicals & Fertilizers (Pvt.) Limited
Address	Director
Contact No.	Defence Officers Colony Sher Shah Road House No.172 Multan Cantt Tehsl & District Multan

3-Name of the organization preparing report

Pak Eco Enviro-Engineering is of the renowned Environmental Consultancy firm in Punjab Province with an unrivalled reputation for providing expert, tailored services and solutions. Pak Eco Enviro-Engineering provides the environmental services, litigation and consultancy to clients both industry and government.

Pak Eco Enviro-Engineering is providing quality services in various environmental sectors i.e.

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

For the preparation of the EIA Report of the said project, the proponent has hired the services of the environmental consultants; M/S Pak Eco Enviro-Engineering Environmental Consultants. Team comprising of environmental engineers, Socio-economist, environmental experts and environmentalists has worked on this report.

The contact details of consulting firm are given in Table below.

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Contact Details	
Consultancy Firm	Pak Eco Enviro-Engineering
Address	Office No.12 First Floor Ahmad Commercial Arcade Hazori Bagh Road Chongi# 9 Multan
Representative	M. Munawar Iqbal (Representative)
Contact	0307-7426188
e-Mail	pakecoconsultants@gmail.com

4-A brief outline of the proposal

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd intend to extend its project with installation of Sulphur 80% WDG manufacturing unit at 5-KM Muzaffargarh Road, Habibabad Sinawan, Tehsil Kot Addu, District Muzaffargarh. The company formerly obtained Environmental Approval for Single Super Phosphate production and now intend to extend the business entity with production of Sulphur 80% WDG in its promises.

Project Title	Construction of Sulphur 80% WDG manufacturing unit by M/s Safi Chemicals & Fertilizers (Pvt.) Ltd.
Project Location	5-KM Muzaffargarh Road, Habibabad Sinawan, Tehsil Kot Addu, District Muzaffargarh.
Total Area	134 Kanal
Capital Cost	PKR about 82 Million
Land Ownership Status	In Possession of Owner
Production Capacity	10 Metric Tons/Day
Energy Source	WAPDA 400 kVA
Project Coordinates	N 30° 279′ 712″ E71° 001′ 301″

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd Ltd. contacted M/s. Pak Eco Enviro-Engineering to develop an EIA of the said project. This Environmental Impact Assessment report along with an Environmental and Social Management and Monitoring Plan (ESMMP) is going to be submitted and presents a point by point account of the predictable environmental and social impacts with their extent and magnitude liable to originate from operational phase of a this fertilizers manufacturing unit at the premises in

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district Muzaffargarh. The report highlights the exercises and the process, which would be in responsibility of creating different possibly unfavorable effects of the undertaking on various environmental and social parameters and additionally other sensitive bio-indicators. It would not be impertinent to mention that review, assessment, screening and mitigation of the negative environmental impacts of a project or developmental activity (like the instant one) is a legitimate commitment of the task defender (proponent) under environmental laws of Pakistan. This report is therefore in fractional satisfaction of this lawful commitment too.

5-The major impacts

The potential environmental and social impacts of M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. activities are assessed using the standard impact assessment methodology. It starts with scoping, through which potential environmental issues associated with the project are identified. This is followed by definition of the criteria for determining significance of the impact, prediction of the magnitude of the impact, assessment of significance, identification of mitigation measures to reduce the adverse impacts to acceptable levels, evaluation of residual impacts, and identification of monitoring requirements.

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. is fertilizers manufacturing unit. During the operational phase different industries put different impacts on the environment.

5.1 Impacts related with Construction Phase

The construction will sometime go round the clock, therefore during all construction activities, the following will be major pollutants/wastes or project related pollution aspects.

- Soil Erosion
- Particulate matter/dust and gaseous emissions from construction machinery and vehicle transporting material
- Noise from construction machinery and vehicles transporting materials
- Garbage as construction waste including clay, sand, crush stones, paper, plastic, wood pieces, iron and steel as scrap, wires ,rags ,ropes etc.
- Dust during raw materials unloading and its use in construction
- Sewage and solid waste from construction camp
- Some social impacts due to accumulation of workers may arise
- Some problems to utilities infrastructure of the area may occur especially due to workers negligence

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A number of machinery and equipment is in operation for the construction of building which includes:

- Batching Plants
- Excavators
- Trucks
- Transport vehicles
- Concrete mixers
- Vibrators
- Welding plants
- Generators etc.

Most of these are using diesel engines that generate noise and emissions. The possibility of exhaust emissions increases when old vehicles/plants are utilized for execution purpose. Generally the above activity is generating the particulate matter, smoke, dust, CO and NOx in ambient air, deteriorating the air quality and resulting in adverse impacts on human heath, fauna and flora. The movement of heavy machinery and vehicles on the dirt tracks is also causing fugitive dust emissions.

Due to movement of vehicles, noise and vibration will be increased and residents of nearby settlement will be affected.

Source of air pollution for this project activities are unpaved roads. Dust plumes behind vehicles moving along unpaved roads represent a typical occurrence since as the vehicle travels over an unpaved road, the force of wheels on the road surface causes pulverization of the surface material. Particles are lifted and dropped from the rolling wheels and road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake continuous to act on the road surface after the vehicle has passed. As an approximation, fugitive dust from unpaved roads can be considered to an average about 75lb per vehicle-mile of travel. This dust would be a problem for the surrounding communities.

5.2 Mitigation Measures of Impacts on Air And Noise

- Tuning of vehicles should be made mandatory to reduce emissions of NOx, Sox, CO and PM10
- Emissions from batching plants should be controlled with appropriate control equipment (Such as fabric filters or cyclone separators)
- Equipment and vehicles powered with diesel should be well-maintained to minimize particulate emissions
- Trucks carrying sand, aggregate and other material should be kept covered during transportation of materials and during storage at site with tarpaulin

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- For construction machinery generating noise in excess of that prescribed in PEQs, Contractor will make arrangement to bring the noise level within applicable limits
- Movement of trucks and other construction machinery causing high noise at night must be restricted to avoid disturbance to the nearby locality. Playing loud music and use of horn at night should not be permitted.
- It is suggested that noise barriers should be installed at construction site during construction phase
- The fugitive dust being a problem to the local community should be mitigated by regular sprinkling of water

6- *Operational Phase*

The details of major impacts and their mitigation associated with the operational phase of the project are shown in coming Chapter (environmental impacts and their mitigation). Other minor environmental impacts that have been discussed and for which mitigation measures have been proposed include disposal of operation related wastewater, and management of hazardous material.

(Waste Water) The current project will be involved in manufacturing of Sulphur 80% WDG which will use about 1500-2000 Litters of water/day and source of water is ground water. The project does not involve any process waste water. The waste water in the form of sewage water will be discharged into the septic tank and after following standard treatment protocols will be used for irrigation purpose to the green belt area of the project site.

(Solid Waste) No Specific / typical solid waste is produced during the process. Typical waste consists of kitchen and warehouse waste. Wastes from warehouse comprise of rejected and/or defected damaged carton, plastic bottles, paper bags, metal, and polythene bags. The average quantity of kitchen waste is about 6kg/week.

(Air Emissions) A temperature of 110C° is maintained at Prilling tower for drying of the Wet Sulphur granules. Dry hot air in the prilling tower is used to meet the objective of drying the water dispersible granules of Sulphur. There is chance of mild gaseous emissions of Sulphur di oxide during the process. However due to unique design and advanced technology of prilling tower, no significant gaseous emissions are expected to be produced during the process as defined in the National Environmental Quality Standards (NEQS). The process of fertilizers manufacturing are producing significant amount of odor. The company is manufacturing granules for fertilizers which might be the source of dust production.

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(Noise) M/s Safi Chemicals & Fertilizers (Pvt.) Ltd will install machinery and equipment for the operation of fertilizers manufacturing. Equipment includes grinding mill, wet grinding mill, formulation tanks or reactors, Agitation and mixing pump, charging pump, Prilling tower etc. The company has WAPDA supply of 400 KVA. These equipment are the source of noise within the working area and could surpass the Environmental Quality Standard designed by Environmental Protection Department of Punjab.

(Occupational health and safety) the company will hire 10 persons as permanent employee and 15-20 persons on daily wages as their workforce depending on the nature of work and availability of staff. These workers might face the occupational health hazards at workplace.

(Fire hazards) As company is the manufacturing of fertilizers and is situated in the hot city of Muzaffargarh where during summer season temperature may reach up to 50°C. The company is using carton and paper products for the packaging of the final products. Therefore there is risk of fire hazard in the company.

7-Mitigation:

Following mitigations have been planned in place for waste water, solid waste, air emission and noise pollution

(For **Waste Water)** The project does not involve discharge of any process waste water. The waste water from washing of plant will be reused on site during next batch production. The project has its own laboratory for waste water analysis. The waste water is only sewage water. The company has already installed septic tank and it performs the treatment for sanitation waste water before using for watering of the plantation area of project site.

(For **Solid Waste)** The kitchen and warehouse waste consists of paper and carton products, rejected and defected bottles. The estimated quantity of municipal/ Kitchen waste is 24Kg/month. The municipal waste is packed in closed containers after segregation and being sold to the private contractor for environment friendly dispose of.

(For **Air Emissions)** Possible emissions of Sulphur di oxide at prilling tower due to temperature effect will be controlled by the latest design and technological advancement of prilling tower. The cyclones will be installed to control possible gaseous emission. To

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control the impact of dust, the project proponent will install Scrubbers. The facility will be provided with proper ventilation mechanism. Through building design, to control the dust emissions, a dust collector will also be installed by the proponent.

(For Noise pollution) Proper maintenance of the machinery will be carried out after specific time interval usually once in a year. Canopies will be installed over the generators to avoid excessive suppression of noise. Workers will be provided with frequent breaks and PPEs during operational hours.

8-Proposed monitoring

The industrial unit is responsible for timely and correct submission of an Environmental Monitoring Report (EMR) to provincial Agency in respect of priority parameters (means those parameters of the National Environmental Quality Standards which have been selected for purposes of submission of Environmental Monitoring Reports to the Federal Agency by an industrial unit). EMR for M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. falls in Category B-3 namely —Manufacturing of Fertilizers, therefore company has to submit EMR on monthly basis .The monitoring program is designed to ensure that the requirements of the environmental approval awarded by Environmental Protection Agency (EPA) are met. A department has been developed within the industry which looks after the management and monitoring plan of overall industry. These sample testing will be carried out through certified environmental laboratory under Pakistan Environmental Protection Agency Regulation, 2000. The unit will be headed by Manager Production Mr. Nasir. The budget of the unit including sample testing on month basis, maintenance of the plants, waste disposal and emergency procedures is covered by the proponent of the industry.

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1. INTRODUCTION

1. 1 Purpose of report

Pakistan being an agro based country has always been in need for fertilizers and it provides a ground for new capital investment and growth, The fertilizer industry of Pakistan has enormous potential and is well on its way to becoming one of the biggest fertilizers exporters in the region in the coming years.

Being primarily an agrarian state, Pakistan's growth is heavily dependent on the fertilizer industry. According to reports, Pakistan's fertilizer demand has always remained higher than in supply. However with the advancement of technology and increased number of players in the industry, the production capacity has increased to approx. 9 million tons per year which has consistently surpassed the national demand over the last few years.

Furthermore the consumption of fertilizer has increased manifold due to heightened awareness among farmers that its usage in good quantity is fruitful for higher yield and a significant increase in their income as the commodity is provided subsidized rates.

The proposed project for which the impact assessment study is being carried out is entitled as "Installation of Sulphur 80% WDG Manufacturing Unit" is proposed to be established at 5-KM Muzaffargarh Road, Habib Abad Sinawan, Tehsil KotAddu, District Muzaffargarh. The proponent of the project is expected to provide high quality of fertilizer to fulfill the demand for better yield of crops.

The development of any project leads to positive and negative changes in environment and social set up around the project area. The intensity and level of change, however, depends upon the nature of project and baseline environmental conditions of the area. The commencement of proposed project will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus an environmental and social impact assessment study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures accordingly.

Muzaffargarh is one of urban cities of Punjab dealing with the population of about 1.9 million according to current census. Among famous fertilizer manufacturing industries, Pak Arab Fertilizers, Vertex Agro-Input, 4-Seasons, Bayer Group are currently operating in Multan city of Southern Punjab.

With increasing population, the demand for agricultural products is increasing day by

day. The present project is the launching of fertilizers manufacturing industry and therefore Environmental Impact Assessment (EIA) report is being submitted to Environmental Protection

Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement for Punjab Environmental Protection Act 1997 (amended 2012) Section 12 for obtaining the Environmental Approval. The other relevant regulations and guidelines including Punjab Environmental Quality Standards (PEQS) for air, water and waste will be considered while preparing this EIA report.

1.2 Identification of Project and Proponent

The current project is the extension of Safi Chemicals & Fertilizers (Pvt.) Ltd. (Fertilizers manufacturing Unit) by installing Sulphur 80% WDG plant at the project site located at 5-KM Muzaffargarh Road, Habib Abad Sinawan, Tehsil Kot Addu, District Muzaffargarh. The proponent intend to extend its project by installation of Sulphur 80% WDG plant in the existing premises of Safi Chemicals & Fertilizers (Pvt.) Ltd. which has already got Environmental approval for Construction phase of Sulphuric Acid & Single Super Phosphate production unit.

Sulphur 80% WDG has wide applications in agriculture industry. It helps in maintaining the appropriate pH of the soil, thereby better uptake of other nutrients, better crop stand, key ingredient in the process of photosynthesis, helps in the synthesis of proteins, Enzymes & Vitamins, controls metabolic & growth processes within plant cells, Promotes nodulation in the legumes, thereby helps in nitrogen fixation and many more.

The details of project proponent are as under:

Table 1.1: Details of Proponent

1	**Proponent**	Mr. Zeeshan Habib
2	**Company**	M/s Safi Chemicals & Fertilizers (Pvt.) Limited
3	**Address**	Defence Officers Colony Sher Shah Road House No.172 Multan Cantt Tehsl & District Multan
4	**Contact No.**	0300-8636413

1.3 Details of Consultant

Pak Eco Enviro-Engineering is of the renowned Environmental Consultancy firm in Punjab Province with an unrivalled reputation for providing expert, tailored services and solutions. Pak

Eco Enviro-Engineering provides the environmental services, litigation and consultancy to clients both industry and government.

Pak Eco Enviro-Engineering is providing quality services in various environmental sectors i.e.

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

For the preparation of the EIA Report of the said project, the proponent has hired the services of the environmental consultants; M/S Pak Eco Enviro-Engineering Environmental Consultants. Team comprising of environmental engineers, Socio-economist, environmental experts and environmentalists has worked on this report.

The contact details of consulting firm are given in Table below.

Table 1.2: Details of Consulting Firm

Contact Details	
Consultancy Firm	Pak Eco Enviro-Engineering
Address	Office No.12 First Floor Ahmad Commercial Arcade Hazori Bagh Road Chongi# 9 Multan
Representative	M. Munawar Iqbal (Representative)
Contact	0307-7426188
E-Mail	pakecoconsultants@gmail.com

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Table 1.3: Team carrying out the EIA Study

The team carrying out the EIA study is as under:

No.	Name	Qualifications and Brief Experience	Roles Assigned
1	Engr. Waqar Ahmad	Environmental Engineer B.Sc. Environment Engineering	• Preparation of Baseline Conditions of the Project Area. • Assessment of Environmental Impacts and Proposing their Mitigation Measures. • Preparation of Environmental Management and Monitoring Plan. • Author of EIA Report
2	Dr. Usama Zafar	PhD Environmental Science	• Author of EIA Report
3	Munawar Chaudhary	M.Phil. Environmental Science	• Site Visits • Legal Reviews • Coordination with Locals
4	M. Wajid	Master of Science-GIS	• Development of Maps

1.4 Brief Description of the project

1.4.1 Nature of the Project

M/S Safi Chemicals & Fertilizers (Pvt.) Ltd. the name, intend to extend its fertilizers manufacturing unit by installation of Sulphur 80% WDG. Sulphur 80% WDG is a dust free, flow able micronized sulphur granules, ease of measuring & handling. It has instant dispersion and high suspensability in water, therefore it don't cause scorching. It has triple action as fungicide, micronutrient (Sulphur) and miticide. It has sustained action for longer effect.

1.4.2 Location and Size of the Project

The project site is located at 5-Km Muzaffargarh Road Habib Abad Sinawan Tehsil KotAddu & District Muzaffargarh. The proposed project spreads over an area of 134 Kanals. The Google Earth Map showing the location of project site and distances from

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nearby sensitive receptors is given in Figure 1-1. The Project Layout Map and colored Google Earth Map are presented in *Annexure C.*



Figure1.1: Google Earth Map of the Project Area

1.4.3 Distance of Sensitive Receptors form Project Site

Table 1.4: Distance of Sensitive Receptors from Project Site

Location	Distance (km)
Residential Areas	
Qasba Gurmani	4.5
Railway Station Gurmani	2.44
Mosques, Industries & Others	
Mosque	1.22
Allied Petroleum Pump	1.44
Hassan Hotel & Cafe	1.42
Fatima Sugar Mill	3.5

The project is located at 5-KM Muzaffargarh Road, Habib Abad Sinawan, Tehsil Kot Addu, District Muzaffargarh. M/S Safi Chemicals & Fertilizers (Pvt.) Ltd. faces Agriculture land in the three directions and link Road in South direction. The geographic location of the project is N 30° 279′ 712″ E71° 001′ 301″. Total area of the industry is about 134 Kanal i.e. 762300 SQF and distribution for covered area is 49043 SQF and uncovered area is 694757 SQF. The covered area comprises of single storey building and further consists of warehouse, well established laboratory,

2. POLICY, LEGISLATION, LEGAL & ADMINISTRATIVE FRAMEWORK

2.1 Regulatory Framework

Government of Pakistan is facilitating investment, both local and foreign, in Liberalization and industrialization in the country, as a policy of the Government is well reflected from its following initiatives:

2.1.1 Deregulation of the Economy

Deregulation is the prioritized policy of the Government of Pakistan. Under same policy there is a systematic movement towards deregulation of the economy and privatization of the state-owned companies.

2.1.2 Import Policy

Import policy has been largely liberalized through the provision of various incentives. And it is being further liberalized at a quicker pace. There is an increased reliance on development of the industrial sector and enhancement of international trade.

2.1.3 Infrastructure Facilities

To facilitate fast industrialization basic infrastructure facilities like roads network, fuel, water and power supply, means of transportation and communications etc. are being improved/developed speedily.

2.1.4 Incentives

In order to maintain Pakistan's competitiveness in international markets and support viability of local and foreign investments in the country, the following incentives are available equally to both the foreign and the local investors:

a) Initial depreciation allowance (IDA),
b) Amortization and
c) Normal tax rates

2.2 Legal Framework

The capability of regulatory institutions for environmental management largely, ensures the success of environmental assessment for ensuring that development projects are environmentally sound and sustainable. For decision-making and policy formulation in the environmental and conservation issues, the institutional framework, as it exists in

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Pakistan, is described below:

2.2.1 National Environmental Regulatory/Legal Requirements

After the 18th Amendment to the Constitution of The Islamic Republic of Pakistan- 1973, the regulation & management of environment has been delegated to the Provinces. The Federal Ministry of Environment has been abolished and instead the Ministry of Climate Change was created which controls: Pakistan Environmental Protection Council; Pakistan Environmental Protection Agency. Since the amendment in the Constitution of Pakistan, all provincial Environmental Protection Agencies are working in their respective jurisdictions independently. The Pakistan Environmental Protection Agency, sometimes known as Pak-EPA, is an executive Government agency of Pakistan managed by the Ministry of Climate Change (formerly Ministry of Environment).

The agency is charged with protecting human health and the environment by writing and enforcing regulation based on laws passed by Parliament. The Pakistan Environmental Protection Act was passed in 1997 by the Parliament repealing the Pakistan Environmental Protection Ordinance 1983. The agency was established under the 1983 Ordinance and saved in the 1997 Act. The agency is led by an appointed director-general, who is appointed by the Prime Minister on the advice of the Minister for Environment.

2.2.2 National Conservation Strategy (NCS) – Pakistan

The National Conservation Strategy (NCS) – Pakistan, as approved by the Federal Cabinet in March 1992 is the guiding document on the environmental issues in the country (Ref. EUAD/IUCN, 1992). The NCS outlines the country's primary approach towards encouraging sustainable development, conserving natural resources, and improving efficiency in the use and management of resources.

The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment. The core areas that are relevant in the context of the envisaged project are pollution prevention and abatement, restoration of supporting forestry and plantations, and preservation of cultural heritage. A mid-term review of the achievements, impacts and prospects of Pakistan's NCS was undertaken between years 1999 - 2000.

-=The Government of Pakistan promulgated—Pakistan Environmental Protection Act in 1977. Two organizations, the Pakistan Environmental Protection Council (Pak-EPC) and

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the Pakistan Environmental Protection Agency (Pak-EPA), are primarily responsible for administering the provisions of the Act. The Pak-EPC oversees the functioning of the Pak-EPA. Among its major members include representatives of the Federal and Provincial Governments especially the Provincial Environmental Protection Agencies, industry, non- governmental organizations, academia, environment experts, Federation of Chamber of Commerce and Industry and the private sector.

2.2.3 Pakistan Penal Code (1860)

The Pakistan Penal Code usually called PPC is a penal code for all offences charged in Pakistan. Pakistan Penal Code is a general criminal law, applies all over the country, and contains specific provisions on the subject. Thus, it prohibits mischief by killing or maiming animals, or damaging works of irrigation or a river or a road or a bridge or drain or firing explosive substances with intent to cause damage. The Code also prohibits public nuisance by acting negligently to spread the infection of disease or disobeying quarantine rule or causing adulteration of food or drink or drug, or fouling water or making the atmosphere noxious to health etc.

2.2.4 Pakistan Environmental Protection Act, 1997

The promulgation of the Environmental Protection Ordinance, 1983 was the first codifying legislation to the issue of environmental protection. Later, the Government passed the Pakistan Environmental Protection Act (PEPA), 1997 which is the basis of IEE/EIA studies carried out for the projects in Pakistan.

PEPA, 1997 is a comprehensive legislation and provides protection, conservation, rehabilitation and improvement of the environment. It contains concrete action plans and programs for the prevention of pollution and promotes sustainable development. The salient features of the law are:

- It covers the air, water, soil, marine and noise pollution including pollution caused by motor vehicles.
- The Act provides National Environmental Quality Standards (NEQS) for wastewater, air emissions and noise.
- Law provides clear cut guidelines for IEE/EIA for various projects as per their magnitude and anticipated impacts.
- Law also empowers Federal Government to issue notices and to enforce them for the protection of the environment.

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For the effective implementation of the provisions of PEPA, 1997, Pakistan Environmental Protection Agency, headed by a Director General was constituted. On the same pattern,Provincial Environmental Protection Agencies (EPA's) were created in all the provinces.Environmental Tribunals were also constituted according to PEPA, 1997.

The Punjab Environmental Protection (Amendment) Act 2012 covers aspects related to the protection, conservation, rehabilitation and improvement of the environment and the prevention, control of pollution and promotion of sustainable development.

The Punjab Environmental Protection (Amendment) Act [PEP(A)A] 2012 establishes complete regulatory and monitoring bodies, policies, rules, regulations and national environmental quality standards. To ensure enforcement, the act establishes regulating bodies i.e. Punjab Environmental Protection Council (PEPC) and responsible bodies i.e. Punjab Environmental Protection Agency (Punjab EPA) at Provincial level. The act extends to the whole of Punjab Province.

Punjab -EPA has the power to arrest without warrant any person against whom reasonable suspicion exists of his having been involved in an offence under the [PEP(A)A] 2012, and enter, inspect and search without warrant any premises, vehicle or vessel. It also provides for seizing any plant, machinery, equipment, vehicle or substance, record or document. [PEP(A)A] 2012 also provides the power to summon and enforce the attendance of any person and issuance of Environmental Protection Order, PO 16, an Environmental Protection Order (EPO), in relation to a person who is contravening a provision of the [PEP(A)A] 2012.

2.2.4.1 Policy and Procedures for the Filing, Review and Approval of Environmenta Assessments/Studies

This document sets out the key policies and procedural requirements. It contains a brief policy statement on the purpose of environmental assessment and the goal of sustainable development and requires that environmental assessment be integrated with feasibility studies. It also defines the jurisdiction of the Federal and Provincial EPA's. It lists down the responsibilities of the proponent and states the duties of responsible authorities. It provides schedules of reports that require either an IEE or EIA.

2.2.4.2 Guidelines for the Preparation and Review of Environmental Reports (November 1997/2000)

These guidelines are descriptive documents regarding the format and content of IEE/EIA reports to be submitted to EPA for — No Objection Certificate (NOC)/Environmental

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Approval (EA). Following are the major areas, which are covered by these guidelines:

- The IEE report (scope, alternatives, site selection, format of IEE report).
- Assessing impacts (identification, analysis and production, baseline data, significance).
- Mitigation and impact management (and preparing an environmental management plan)
- Reporting (drafting style, main features, shortcomings, other forms of presentation).
- Review and decision making (role, steps, remedial options, checks and balances).
- Monitoring and auditing (systematic follow up, purpose effective data management).
- Project Management (inter-disciplinary teams, programming and budgeting)

2.2.5 National Environmental Quality Standards (NEQS)

The National Environmental Quality Standards (NEQS) were first promulgated in 1993 and have been amended in 1998 and 2000. The following standards are specified therein:

a) Maximum allowable concentrations of pollutants (32 parameters) in municipal and liquid industrial effluents discharged to inland waters, sewage treatment facilities, and the sea (three separate sets of numbers).

b) Maximum allowable concentrations of pollutants (32 parameters) in Drinking water (including physical, chemical, biological, organic and radioactive parameters).

c) Maximum allowable concentrations of pollutants (112 parameters) in gaseous and particulate matter emissions from industrial sources.

d) Maximum allowable concentrations of pollutants in gaseous and particulate matter emissions from ambient air.

e) Maximum allowable concentrations of noise in ambient air.

2.2.5.1 National Environmental Quality Standards for Ambient Air- November- 2010

The Ministry of Environment, Government of Pakistan vide its Notification, Islamabad, the 18th October 2010 under S.R.O. 102 (1)/2010 established standards which provide the maximum allowable limits, in the ambient air, of Sulphur Dioxide (SO2), Oxides of Nitrogen as (NOx) and as (NO), Suspended Particulate Matter-(SPM), Respirable

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- There should be a special emphasis on consultation with affected groups when preparing a Resettlement Action Plan (RAP).

The provisions of the Draft Resettlement Policy are consistent with the requirements of the World Bank OD 4.30 on involuntary resettlement.

2.4 Forest Act 1927

All India Forest Act, 1927 was adopted by the Government of Pakistan, which was subsequently implemented by the respective provinces. Basically, the law was enacted to conserve and protect the forest resources of the country for sustainable development. It lays down Rules and

Regulations for exploitation of various categories of forests such as reserved, protected or unclassified. Further, the Act spells out the licensing method for timber cutting, grazing, hunting etc. It also gives the details of magisterial powers of Forest Department officers and penalties for offences committed about forest resources and products.

2.5 Industrial Relation Ordinance, 2002

The ordinance has been promulgated to amend, consolidate and rationalize the law relating to formation of trade unions, regulation and improvement of relations between employers and workmen and avoidance and settlement of any differences or disputes arising between them Pakistan's labor laws trace their origination to legislation inherited from India at the time of partition of the Indo- Pak subcontinent. The laws have evolvedthrough a continuous process of trial to meet the socio-economic conditions, state of industrial development, population and labor force explosion, growth of trade unions, level of literacy, Government's commitment to development and social welfare. To meet the above-named objectives, the government of the Islamic Republic of Pakistan has introduced many labor policies, since its independence to mirror the shifts in governance from martial law to democratic governance.

While Article 18 of the Constitution affords every citizen with the right to enter upon any lawful profession or occupation, and to conduct any lawful trade or business, the Industrial and Commercial Employment (Standing Orders) Ordinance was enacted in 1968 to address the relationship between employer and employee and the contract of employment. The Ordinance applies to all industrial and commercial establishments throughout the country employing 20 or more workers and provides for security of employment. In the case of workers in other establishments, domestic servants,

farm workers or casual labor engaged by contractors, their labor contracts are generally unwritten and can be enforced through the courts based on oral evidence or past practice. The Constitution of Pakistan contains a range of provisions with regards to labor rights found in Part II: Fundamental Rights and Principles of Policy.

- Article 11 of the Constitution prohibits all forms of slavery, forced labor and child labor;
- Article 17 provides for a fundamental right to exercise the freedom of association and the right to form unions;
- Article 18 prescribes the right of its citizens to enter upon any lawful profession or occupation and to conduct any lawful trade or business;
- Article 25 lays down the right to equality before the law and prohibition of discrimination on the grounds of sex alone;
- Article 37(e) makes provision for securing just and humane conditions of work, ensuring that children and women are not employed in vocations unsuited to their age or sex, and for maternity benefits for women in employment.

2.5.1 Punjab Industrial Relations Bill 2010

In December 2010 Punjab Assembly passed new legislation that will govern the formation of trade unions, relations between industries and their workers, and the process for the settlement of labor disputes.

2.5.2 Industrial Relations Ordinance 2011 Promulgation

The Government has promulgated Industrial Relations Ordinance 2011. The Ordinance has been approved by the President on the Advice of the Prime Minister. The Government has promulgated Industrial Relations Ordinance, 2011 in view of the current legal vacuum created due to deletion of the concurrent Legislative List through the 18th Constitutional Amendment. The Industrial Relations has also been transferred to the Provinces which have promulgated provincial laws to regulate industrial relations. However, there is no law in place to deal with Industrial Relations in the Islamabad Capital Territory or in respect of national level trade federations and for resolutions of trans-provincial industrial issues. The Parliament has yet to promulgate the Ordinance as law.

2.6 Provincial Local Government Ordinances, 2001

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

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3. DESCRIPTION OF THE PROJECT

This section includes a description of project objectives, site location, site layout, process description along with significant equipment and utilities at M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. This also includes the details of installation and an overview of the project. The salient features of the project are discussed to the extent that they relate to potential environmental and social impacts.

3.1 Screening/Type and category of the project

The current project is construction phase of fertilizers manufacturing industry under the name M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. with the area of about 134 Kanal. As per review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) regulations (2000), the establishment of fertilizers manufacturing plant falls under **Schedule II** in Section **B-3** in category of projects mentioned in **Schedule II** under the title Manufacturing of fertilizer. Therefore the project falls in the category of the projects which require **EIA**.

3.2 Objectives of the project

A fertilizer is any material of natural or synthetic origin that is applied to soil or to plant tissues to supply plant nutrients. Fertilizers may be distinct from liming materials or other non-nutrient soil amendments. Many sources of fertilizer exist, both natural and industrially produced. For most modern agricultural practices, fertilization focuses on three main macro nutrients: Nitrogen (N), Phosphorus (P), and Potassium (K) with occasional addition of supplements like rock dust for micronutrients. Farmers apply these fertilizers in a variety of ways: through dry or pelletized or liquid application processes, using large agricultural equipment or hand-tool methods.

The current project of M/s Safi Chemicals & Fertilizers is associated with production of Micro-Nutrient Sulphur 80% WDG to enhance the plant growth as a good agricultural practices.

Table 3.1: Types of Fertilizers being manufactured by M/s Safi Chemicals & Fertilizers (Pvt.) Ltd

S#	Product/Chemical	Production capacity/day
1	Single Super Phosphate (SSP)	250 Tons/day
2	Sulphur WDG 80%	10 MT/Day

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The current project are based over the above objectives which describe good quality with no banned products and secondly advisory services to the farmers for the proper usage of these in big cities of South Punjab and its neighboring rural area.

3.3 Alternatives considered realistically (in detailed) and reason for their rejection

3.3.1 No project option

The No-Action 'option, if taken, will prevent the country from reconnoitering the potential to increase its fertilizers demands. The current activity offers a chance to improve Pakistan's agricultural products balance and decrease the gap between the good crop requirements by the application of fertilizers. Other impacts of the No-Action 'option would be loss of employment opportunities and infrastructural development in the project area, as the project is bound to create jobs and improve the existing infrastructure of the surrounding areas.

3.3.2 Alterative Technology option

Using EURO II fuel in engines like generators and other machinery instead of diesel or bad quality fuel oil would create less opportunity of gaseous emission. No need for effluent treatment as the project does not involve significant amount of process waste water. The only waste water is the sewage waste water which is discharged in the surrounding agriculture land owned by the proponent after following the standard treatment protocols.

3.3.3 Shifting of the project to some other location

The third option for the project is to shift the project to some other location if it might be feasible but here in this case, the project land is owned by the proponent and sensitive indicators are at a safe distance from the project site and proponent has already obtained Environmental Approval for Single Super Phosphate production for same project site. The proposed site was selected for the installation of project due to the following reasons.

- The project site is at a distance of at least 01 Km from the nearby residential area.
- No water surface body is located near to the project area
- No human settlement displacement or relocation associated with the project development and operation
- The operation of fertilizers processing unit in the respective zone will provide job opportunities to local people and will improve the socio-economic status of the study area as 10 will be working during the operational phase of project
- The site is connected to other main cities through Muzaffargarh Road

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- No important religious, archaeological, recreational site or ecologically sensitive area and human settlement exist within proximity of selected site.
- The existing project premises is owned by the proponent and has already obtained Environmental Approval for Single Super Phosphate production from EPA Punjab

In view of the above stated facts, it can be concluded that the selected site is the best suited for the project and will not pose any adverse impact or threat on any component of the environment.

3.4 Land ownership

Present land ownership is a critical issue as land acquisition can have complex social impacts such as resettlement and potential loss of livelihood of the owners and their tenants. Although tools like resettlement action plan and compensation entitlement framework can address the land acquisition related social issues, often resentment remains among the communities. Therefore, it is desirable that the site for the project is either located on land owned by the project proponent or is owned by another corporate body or a government agency. Since land is owned by proponent himself there is no issue of land ownership.

3.5 Estimated population on the surrounding of the site

In terms of the social and environmental soundness the most preferable site should be the one that has the least number of persons residing in its surroundings. Potential issues related to noise, air pollution, and community safety become more difficult to mitigate if the

Project is located in relatively congested areas. For this purpose the settlements falling inside a 5km radius of the sites are being considered and the number of people residing within the said radius is estimated. The project land is situated in the rural area and very few scattered houses are present at a safe distance from the project site. However the settlement area is beyond 1 km from the project site. The details of population residing and their life style are described in demography section of the report.

3.6 Access to the site

Clear and unencumbered access to the project site is critical not only from operational point of view but due to environmental concerns. The issues that are related to access road include community safety, dust emission, and noise due to plant related traffic particularly during the transportation of raw material and final product to and away

3.9 Process Flow diagram

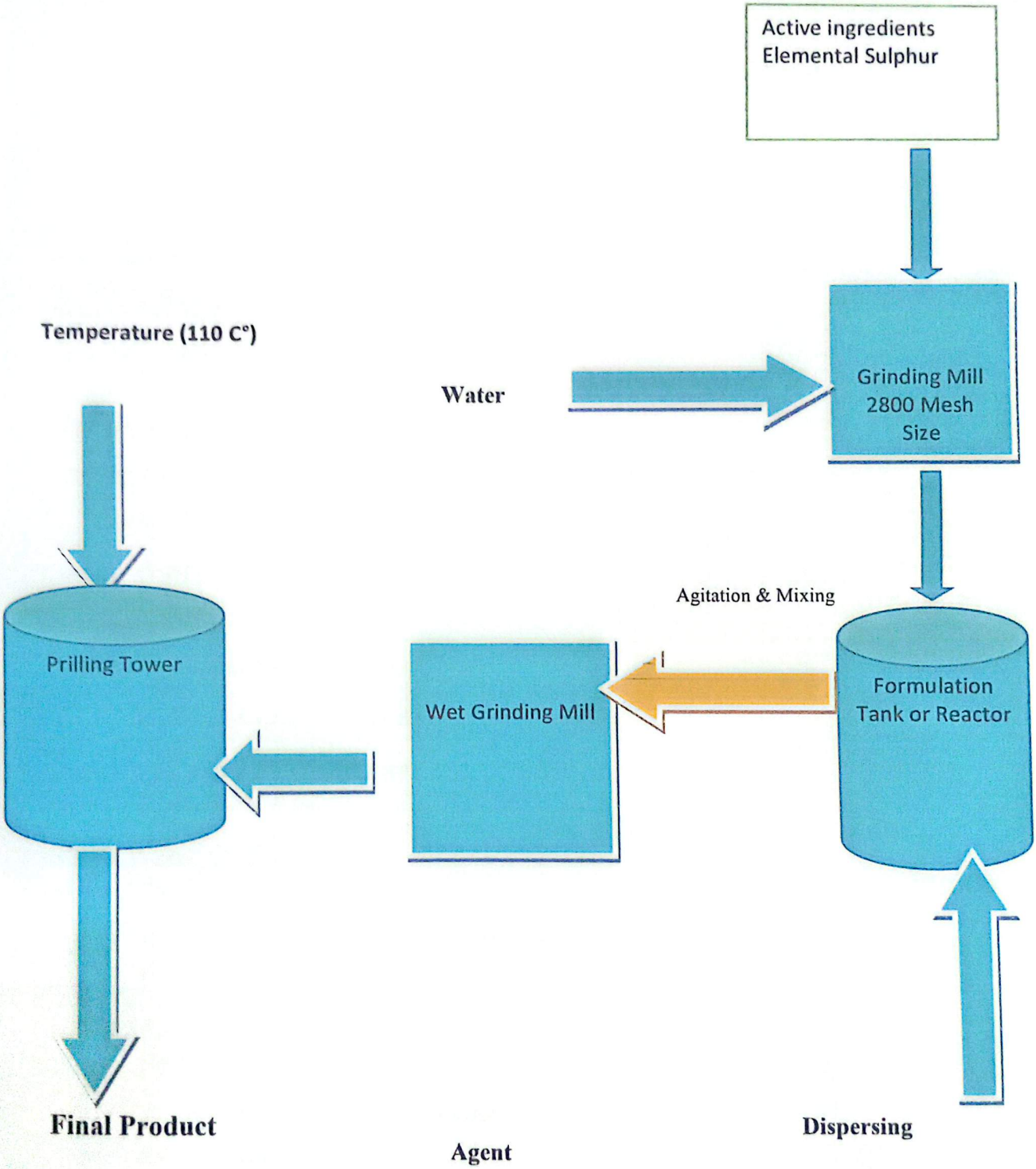

Fig.3.2: Process Flow Diagram of Project

3.9.1 Method of Production

STEP (1): Grind Elemental Sulfur up to 2800 mesh size by grinding mill in presence of water.

STEP (2): Continuous feed grinded sulfur in chamber with Dispersant

STEP (3): Mix wetting agent and Dispersing agents in circulation tanks.

STEP (4) Pass product through wet grinding mills to obtain required particle size.

STEP (5): Now feed product in prilling tower at 110C temperature.

STEP (6): Final product obtained from cyclones.

Mass Balance Equation

Elemental Sulphur +Water+ + Dispersing agent —Temperature→ Sulphur80% Granules + Waste (0.01%) Which is reused

3.9.2 Production Capacity of Manufacturing Plant

- Sulphur 80% WDG 10 MT/day

3.9.3 Raw material and source

- Elemental Sulphur, Dispersing Agent, Wetting Agent

3.9.4 Final Product (Name and Physical Form)

- Sulphur 80% WDG

3.10 Water source

- Ground Water

3.10.1 Water Requirements (Estimated Quantity Usage)

- 1500-2000 litters/Day

3.10.2 Final Disposal of Process Wastewater if Generated

- Not Generated

3.11 Solid waste Quantity Generated per Day

Kitchen Waste 6kg/day

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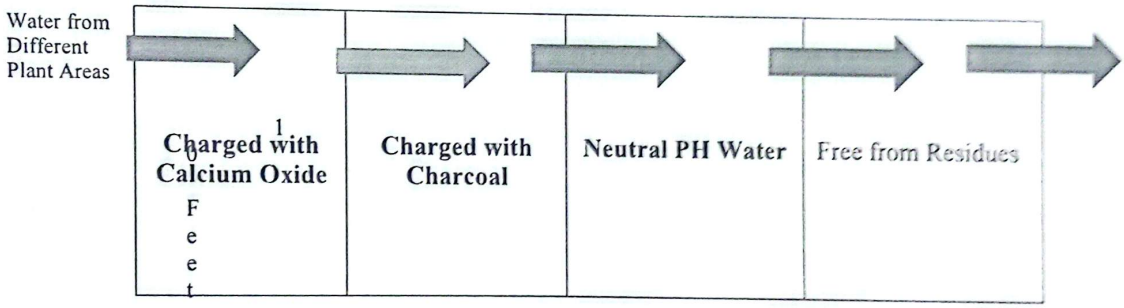
The project does not involve any process waste or by product waste. The type of solid is only municipal waste or kitchen waste. The municipal waste will be in the form of damaged propylene bags, tin packs, damaged cartons, plastic bottles etc. which will be stored in closed containers and dispose of at a proper disposal site as per TMA standards. The estimated daily quantity of solid waste for maximum 15 person would 6 kg/day. The recyclables will be given to local recycle materials collectors for recycle purpose. No process or chemical solid waste is involved in the project. The municipal waste will be collected in covered containers/bins placed at project site. The containers or bins will be disposed of before reaching their carrying capacity. Littering is strictly prohibited in the project area.

Source of power

- WAPD/Standby Generator 200 KVA

Septic tank for the unit



Drawing of septic tank with specification

3.12 Land use on the site

The land of the project is owned by the proponent itself. The project site is already in use of Safi Chemicals & Fertilizers (Pvt.) Ltd. and installation of Sulphur 80 % WDG Plant is the extension of project in the same premises which already has got Environmental Approval for the production of single super phosphate from EPA Punjab. The copy of NOC is attached in Annexures for ready reference. Since the project land is already in use of Safi Chemicals & Fertilizers (Pvt.) Ltd. so the site does not involve of any environmental sensitive issue which might be generated due to presence of archeological, agricultural or other residential glitches. The site is not residential and commercial activities including petrol pumps, shops are sparse.

The land use status of project site is given in the following table 3.2

Table 3.2: The land use status of project area

Coordinates	Description
GPS Coordinates	N 30° 27' 7.12" E71° 00' 30.1"
North	Agriculture land
East	Agriculture land
West	Agriculture land
South	Link Road

3.13 Road Access

The present project M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. is situated at Mehmood Kot Road and is accessible from Dg Khan and Multan Districts. The total traffic counts for the metal road facing the site are observed during the visit under following calculations

Table 3.3: Traffic counts for the project facing metal road from small to medium and large scale vehicles

Time	Large Vehicles(truck buses, tractor trolleys, Minibuses)	Medium sized vehicles(Suzuki pickups, cars, jeeps, taxis	Small vehicles (Rickshaws, Motorcycles, Scooters	Slow vehicles (Animal, driven carts, tongas)
6:00 A.M – 9:00 A.M	1-2	1-2	10-12	4-5
9:00 A.M– 12:00 A.M	5-7	5-7	25-30	3-4
12:00 A.M-3:00 P.M	5-7	5-7	25-30	3-4
3:00 P.M – 6:00 P.M	4-5	4-5	25-30	4-5
6:00 P.M – 9:00 P.M	1-2	1-2	5-7	2-3

3.14 Cost and magnitude of the operation

The total cost of the project is 821 million rupees including land, construction of the project, purchase of machinery and its installation. The company will install unit of machinery and bifurcation of expensed are in terms of purchasing of land, construction including the cost of land preparation, office construction and plant building construction and other developmental work including the cost of purchasing and installation of machinery. The project will remain functional about the whole year depending the availability of raw material.

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. is a fertilizers manufacturing unit and is

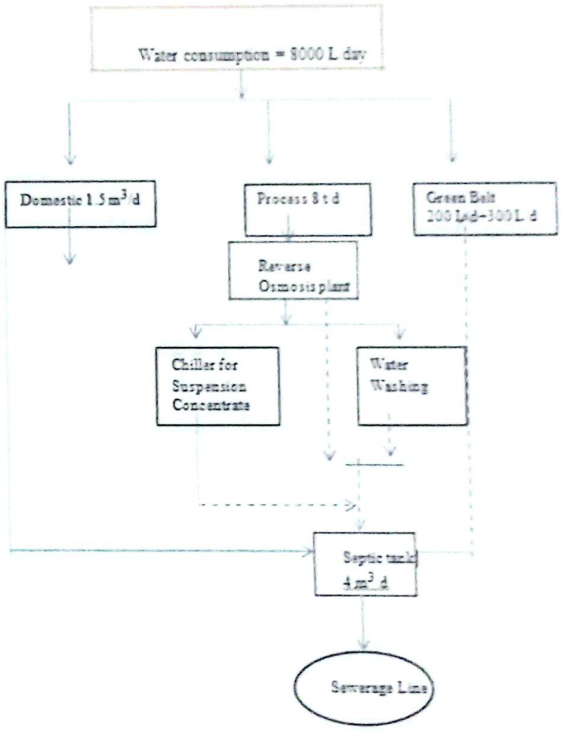
associated with manufacturing of Single Super Phosphate. The magnitude of the operations for different fertilizer products is given the following table 3.4.

Table 3.4: Magnitude of Operation for M/s Safi Chemicals & Fertilizers (Pvt.) Ltd

S#	Product/Chemical	Production capacity/day
1	Single Super Phosphate	250 MT/ day
2	Sulphur 80% WDG	10 MT/day

3.15 Availability of Water

The water requirements for the operational phase of the project is about 1500-2000 L /day. The water requirements of the project depend on batch production not on daily basis. The production capacity is detailed in previous section. Adequate quantity of underground water is available to meet even all project requirements. The bore is about 250 feet deep. Three Electric motor with capacity of 1 HP & 2 HP for water extraction will be installed. The usages include processing and sewerage water consumption. The project has its own Reverse Osmosis plant with a capacity of 1 ton/hour. Water balance diagram is shown below with major consumption within the industry.



A flow chart representing the water balance of said project

3.16 Schedule of implementation

The project of installing Sulphur 80% WDG plant is still proposed and is the extension of Safi Chemicals & Fertilizers (Pvt.) Ltd. in the project premises which has got the Environmental Approval.

3.17 Description of the project (process flowchart)

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. intend to extend its Fertilizers manufacturing unit by installing plant of Sulphur 80% WDG in the project premises

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which has already obtained the environmental approval under section-12 of PEPA 1997 (Amended-2012). M/s Safi Chemicals and Fertilizers (Pvt.) Ltd. is manufacturing Single Super Phosphate (SSP). Single Super Phosphate is used as fertilizers for making better crop yield. Sulphur 80% WDG is used as micro fertilizers which is water dispersible and in the form of granules. Sulphur 80% WDG is used as fertilizers and potent fungicide by the farmers to get better crop yield. Major equipment used for the operation consist of grinding mill. Wet grinding mill. Reactor, Circulation tank, Storage tank and prilling/drying tower, Agitator, Agitation motor, circulation lines and filling vessels.

STEP (1):

Grind Elemental Sulfur up to 2800 mesh size by grinding mill in presence of water.
The elemental Sulphur is of different size. In the first step, the active ingredient elemental Sulphur is grinded up to 2800 mesh size in grinding mill. The process of grinding is carried out in the presence of water. The required size of Sulphur is obtained by grinding the grinding mill.

STEP (2):

Continuous feed grinded sulfur in chamber with Dispersant.

During this step different types of dispersants are used in order to remove hardness of Raw Sulphur and to make fine slurry.

STEP (3):

Mix wetting agent and Dispersing agents in circulation tanks.

In this step, the ingredients are further homogenized by adding wetting agents for getting of fine slurry in the circulation tanks.

STEP (4)

Pass product through wet grinding mills to obtain required particle size.
In order to obtain required particle size, the homogenized material is again passed through the wet grinding mill. Wet grinding mill further reduce the particle size for necessary application.

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STEP (5)

Now feed product in prilling tower at 110C temperature

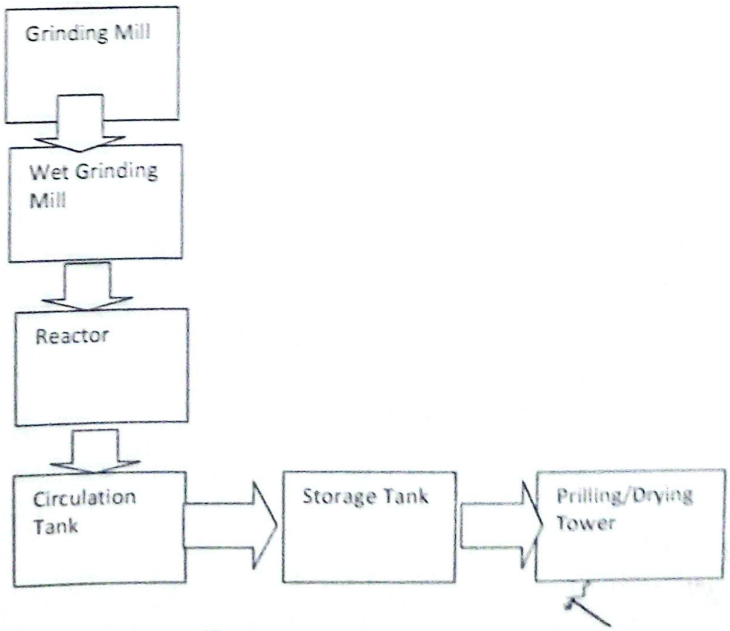
During this step, the fine particles of Sulphur are fed into the prilling tower. The temperature is kept at 110C°. The atomised particles come in contact with the hot air entering the chamber in a co-current fashion through an air distributor. For agglomeration of the product an integrated fluid bed dryer is provided at the bottom of the chamber. The product is further passed through the fluid bed dryer for final drying and cooling purpose. The product is collected at the bottom of the fluid bed dryer. Dehumidified air passed through the fluid bed dryer.

STEP (6):

Final product obtained from cyclones

The process starts with charging the active indigents through pipelines in reactor. Before start of the process, reactors are washed and rinsed with methanol, water or xylene. With certain intervals of time, technical, emulsifiers and raw materials are added and mix properly by agitation. Then more solvents are added to make up the volume and again agitate for specified period of time. Circulations along with agitation are carried out for a given time according to the recipe and are stopped after certain interval. Lab analyses are carried out after the final agitation and if the sample which was sent to Laboratory is satisfactory then are transferred to Storage Tank. Finally resultant products are sent to filling vessels for the start of filling to finished product.

The process flow chart applicable for M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. is shown below



3.18 Restoration and rehabilitation plans

No human population resides within the project area. The project land is owned by the proponent. All the sensitive receptors are at a safe distance from the project site. No structure of any significance stands on the land selected for the project requiring dismantling or relocation. Hence no relocation and resettlement is required. However to maintain the aesthetic beauty of the project, the proponent has planted 4000-5000 trees of indigenous species around the vicinity of the project site.

3.19 Government Approvals

The main govermental approval required in present case is Environmental Approval/No Objection Certificate from Enviornmental Protection Agency (EPA), Government of the Punjab for construction and operation of the project. The proponent has obtained Environmental Approval from EPA Punjab for Single Super Phosphate Production for the premises. The existing project of Sulpher 80% WDG is the extension of the project in the same premises. For securing Enviornmental Approval of Sulphur 80% WDG, the Proponenthas has filed this case with EPA, Punjab.

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4. DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influence area with respect to the physical, biological, and social aspects. In addition to the secondary data, the field survey was carried out in July, 2021 and the environmental baseline conditions were established based on socioeconomic interviews; impact location profiles; environmental profile questionnaires and public consultations.

M/s Safi Chemicals & Fertilizers (Pvt.) Ltd will extend its project by installation of Sulphur 80% WDG Plant, at Mouza Jhandeer Dureja Sharqi 5-KM Muzaffargarh Road, Habib Abad Sinawan, Tehsil Kot Addu, District Muzaffargarh in southwestern Punjab which is located on the bank of River Chenab. The geographical co-ordinates of the project site are 30° 279′ 712″ N and 71° 001′ 301″ ^{o}E with the elevation of 122 m from above mean sea level (information taken from Google map).The adjoining area of the project site has no important physical features. The road access to the project site is totally asphalted.The existing environment around the Project area has been studied in detail with respect to physical, ecological and socio-economic resources.

4.2 PHYSICAL RESOURCES

District Muzaffargarh lies in the form of a strip between the Rivers Chenab and Indus which passes Eastern and Western boundaries respectively of the district and form a triangle at Tehsil Alipur. The district is bounded at North by newly formed district Layyah, on the South by Bahawalpur and Rahim Yar khan districts across the River Chenab. District Jhang also touches on North-East, while district DG Khan and Rajanpur lie on the Western side across the River Indus. District Muzaffargarh is spread over an area of 8249 square kilometer comprising of following four tehsils

- Tehsil Muzaffargarh
- Tehsil Alipur
- Tehsil Jatoi
- Tehsil KotAddu

The further description of physical environment which includes topography, geology, soil,

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surface water and groundwater, climate, seismicity etc. of Muzaffargarh district is presented in the following sub-sections

4.2.1 Topography, Geology& Soil

Generally, the soil of Muzaffargarh is variable in character and inclined to be dry. The land of district also comprises of sand dunes. However, the plain land is normally very fertile and rich in potential plant nutrients. Due to the presence of two rivers Chenab and River Indus the soil of the district is very fertile and enriched with nutrients. The land of project site is already in use of M/s Safi Chemicals & Fertilizers (Pvt.) Ltd and existing project of Sulphur 80% WDG is the extension of said project. The project land is at the level of surrounding agriculture fields.

4.2.2 Hydrology

The whole of Muzaffargarh plain is made of alluvial soil sloping gently from North-East to South-West with a slight slope also from North-West to South-East. The formation is of very recent origin formed by the ever changing course of Chenab and Indus. It is clear from the fact that one will find sand below a few feet of clay.

4.2.3 Underground 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 in different areas and at different depths. Irrigation supplies are perennial and tube wells have been installed to make up the deficiencies. Piped water supply is available in 30,569 housing units of Muzaffargarh. There should be no impact on these sources of water during the construction.

4.2.4 Surface Water/Wet Lands

The area around the city is ideal for agriculture alluvial plain and ideal for agriculture. The agricultural crops are fed by two famous Muzaffargarh canal and T.P link canals. Both canal arise from River Indus at Head Taunsa Barrage. Due to the presence of River Chenab and Indus, the water table of the area is comparatively high and very suitable for growth of sugarcane. River Indus and Chenab and a number of associated lakes are important wetlands of the district.

4.2.5 Air and Noise Quality in the Project Area

Presence of sufficient number of trees in the adjoin agriculture fields of the Project site

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keeps the environment in favorable conditions. The air quality and noise level in the project area are good in condition. The project being located in Agricultural area, the greenery and tree plantation is on large scale due to which the air quality and noise level have no significant effect. Air and Noise Quality of the project site are attached accordingly their PEQS parameters.

4.2.6 Seismicity

Seismic Zoning Map of Pakistan showing Proposed Project site area is presented indicating zones according to the Building Code of Pakistan - 2007. The project site is in Muzaffargarh district, thus project site falls in Seismic Zone 2A according to the Seismic Zoning Map of Pakistan. Zone 2A (moderate limit of high damage) represents peak ground acceleration (PGA) from 0.08 – 0.16.presents the Seismic hazard map of Pakistan prepared for Peak Ground Acceleration (PGA) for 500 years return period, with intensity level at "medium category".

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5. STAKEHOLDERS CONSULTATION

5.1 General

Any person, group or organization with an interest in the project or who can be affected directly or indirectly, negatively or positively by the project activities is a project stakeholder. Because of their interests and concerns, it is very important to take stakeholders into confidence regarding the project need and impacts, and their management. Stakeholder consultation is a mean of involving the entire primary and secondary stakeholders in the project decision making process in order to address their concern, improve project design and give the project legitimacy. Stakeholder consultation, if conducted in a participatory and objective manner, is a mean of enhancing the project stability.

Community input (both of knowledge and values) on socioeconomic and environmental issues can greatly enhance the quality of decision making. Stakeholder consultation was therefore conducted in the project area, not only to satisfy legal requirement of EIA in Punjab but also to improve and enhance the social and environmental design of the project.

5.2 Objective of the Stakeholder Consultation

Role of the public participation is very important in the design making process to achieve the goal of sustainable development. The major objectives of public consultation are as follows:

- Promote better understanding of the project, its objectives and its likely impacts and their management.
- Identify and address the concerns of all interested and affected parties of the project.
- Provide a mean to Identify and resolve issues before plans are finalized and development commences, thus avoiding public anger, resentment and potentially costly delays.
- Encourage transparency, and inculcate trust among various stakeholders to promote cooperation and partnership with the communities and local leadership.

5.3 Proponent

All possible impacts and mitigation measure related to the project were discussed with the proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environment friendly.

5.4 The Responsible Authority

The M/S Safi Chemicals & Fertilizers (Pvt.) Ltd. will be the responsible authority to take all

measures prior to start the project and during operation.

5.5 Other Departments and Agencies

For the impact analysis detailed with the management, local community, educational institutes, health institutes, hospitals and NGOs. All issues were discussed related to implementation of the project. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area.

5.6 Consultation process

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in Saraiki, Punjabi and Urdu languages depending upon the receiver understandings. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation. A simple questionnaire was prepared for this purpose to collect concerns of the people with the current project.

By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews, and participatory rural appraisal EIA involved the community in active decision-making. This process will continue even after this EIA has been submitted, as well as during future EIAs in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues in the context of a proposed project.

Secondary stakeholder consultations were more formal as they involved government representatives and local welfare organizations, NGO's consulted during face-to-face meetings and through telephonic conversations. They were briefed on the EIA process, the project design, and the potential negative and positive impacts of the project on the area's environment and communities.

It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with tribal leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

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5.6.1 Stakeholder Consultation Techniques

In recognition of diversity of views within any community, it is very important to obtain a clear understanding of the different stakeholders' views and concerns regarding the project and to analyze their capacity and willingness to be involved in some or all of the project and its planningprocess. It is important to be aware of how different power relations can distort the participation. It is also important to know that how community skills, resources and knowledge can be applied to improve the project implementation. All of this can be achieved by careful use of various toolsof



Fig. 5.1: Meeting with primary stakeholders

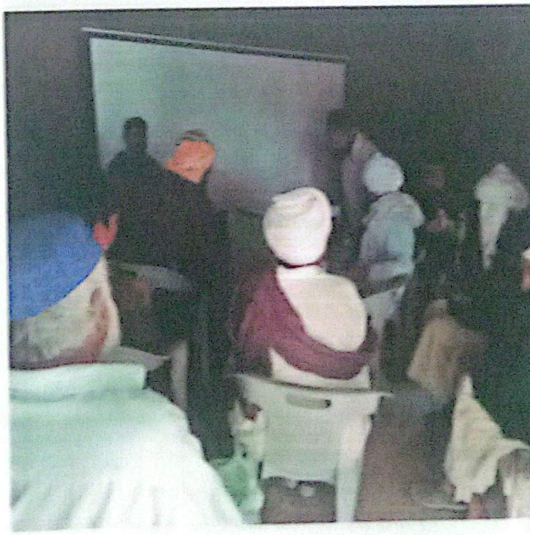
stakeholder consultation. Therefore the following participatory techniques were employed during stakeholders' consultation:

- Informal meeting with the communities in neighborhood areas; men and elders attended these meetings.
- Focus group with women participants in surrounding areas.

5.6.2 Stakeholders Consulted

In consultation process for EIA, the following stakeholders were consulted.

- Local communities, men, women and elders attended the meetings
- Local Government representatives
- Meeting with stakeholders comprised of community



Meetings with stakeholders consisted of community consultation meetings, focus group discussions, and in-depth interviews with men and limited focus-group discussion. The location of the meetings, the

process followed, and the outcomes are discussed in this section. Given that the project area has a game reserve and numbers of reserve forests, the Forest Department and Irrigation Department were also consulted. The list of the villages where public consultation was carried out is given in **Table 15** while the photographs of consultations are included as evidence.

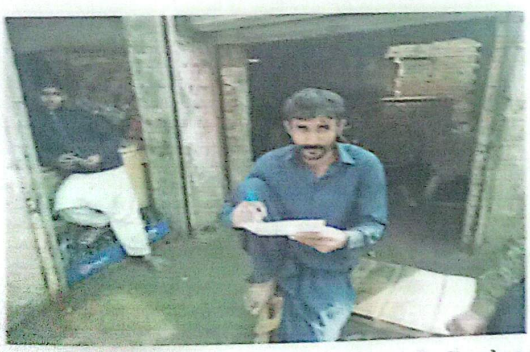
5.6.3 Stakeholder Concerns and Recommendations

The finding of the community consultation has been addressed in this sections of EIA. Mitigation plan has been incorporated into EMP. The community consultations demonstrated that goodwill towards the project proponent indeed exists. Approval for project activities by communities was evident. The consultations were considered a good gesture and were appreciated; especially by men and women.

5.6.4 Community Concerns

5.6.4.1 Project Approval

The community consultations demonstrated that good will towards the project proponents indeed exists; approval for project activities by the communities was evident. The consultations were considered a good gesture and appreciated, especially by the men and women. The poverty level is



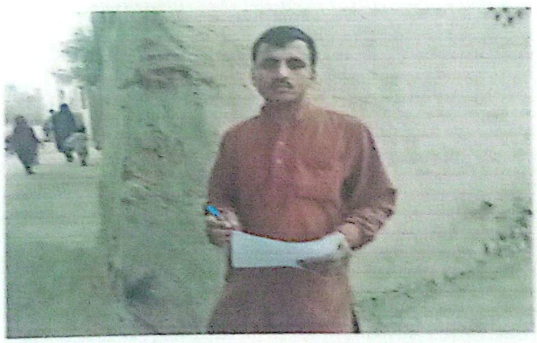


Fig. 5.2: Socioeconomic survey feed back

such that communities are looking to any project proponent to improve their financial well-being to a great extent. M/s Safi Chemicals & Fertilizers (Pvt.) Ltd. recognizes that benefits from the project should be distributed judiciously and equitably especially among primary stakeholders in the project area, and will continue to ensure that this principle is followed in its projects and community development program. Following are the pictorial view of local public consultation

5.6.4.2 Resettlement/ Relocation

The proposed site is located the agriculture zone and the land is already owned by proponents of the project. Therefore, no issue of the resettlements is there. The nearby village is Qasba Gurmani and is

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5.6.6 Local Government Representatives

The consultations were considered a good gesture and appreciated. They also expressed the jobs and business opportunities for the local community will be increased due to project activities. They also expressed the concern that most of the unskilled and skill jobs should be reserved for the local communities. Besides, students of Bahauddin Zakariya University (BZU) were consulted for their concern about the project impacts.

Table 5.1: Stakeholder Consultations Conducted During EIA Study

Location	District	Participants
Local Communities		
Qasba Gurmani		M. Wajid
	Sinawan Muzaffargarh	Ahsan Tareen
		Zafar Iqbal
		M. Ehsan Elahi
		Mogin Raza
		Zulfqar Ch.
		Shahid Ashraf
		Imad ud Din
		Rizwan
Qasba Gurmani	Sinawan Muzaffargarh	
		Munir Hussain
		Rao Hamza
		Rashid LAtif
		Khalid Bhatti
		Muhammad Shakoor
Department of Environmental Science, Bahauddin Zakariya University		
		Zara Nazish
		Hamid Hussain
		Muhammad Irfan
		Waqar Ahmed Gujjar
		Zain Ul Abidin
		Fatima Imtiaz
		Fida Ul Haq
Government		
Forest Department		Nauman Ilyas
Irrigation Department		Muhammad Asif
Local Government		
Non-Governmental Organizational (NGO)		
WWF	Multan Office	Jamshed Choudhary

6. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 General

This chapter discourses the potential environmental and social impacts of the project activities separately during both construction and operation phases, predicts the magnitude of the impacts, assesses their significance, identifies the mitigation measures to minimize to a tolerable level, if impossible to completely eliminate the adverse environmental impacts and evaluates the residual impact of the project. Environmental impacts of a project are driven out using numerous factors and parameters, due to which it is necessary in the study area to carry out comparative analysis with that area where there is no activity to be commenced yet.

6.1.1 Impact Assessment Methodology

Once potential impacts have been identified, the assessment of these potential impacts will follow these steps:

6.1.2 Definition of criteria for determining the significance

The consequences of the project activity are evaluated by weighing them against recognized significance criteria. The criteria are of following types:

- Institutional recognition- law, standards, government policies and plans
- Technical recognition- guidelines, scientific or technical knowledge.
- Public recognition- social and cultural values and opinions of a segment of the public;especially the community directly affected by the project.
- Professional interpretation of evaluator.
- Prediction of magnitude of the potential impacts
- This step refers to the description, quantitatively (where possible) or qualitatively, of theanticipated impacts of the project.

6.1.3 Identification of mitigation measures

It is determined that the predicted impact is significant when compared with the criteria for determining the significance, suitable mitigation measures are identified. These measures can be classified into following categories:

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- Avoiding the impacts altogether by not taking certain project activity or part of an activity or by changing the way the activity is being performed or by modifying the equipment being used for the purpose. For example, using CFC free equipment to avoid the impacts
- on the ozone layer and using cooling tower (if required) running on phosphate base instead of chromate base to avoid chromium impurities in effluent water.
- Minimizing impacts by limiting the degree or magnitude of the activities or by exchanging the process, raw materials, products, other accessories or equipment with one that can reduce the impact. For example, minimizing dust emission by reducing the vehicular traffic and minimizing noise by operating noisy machinery in sound-proof rooms.
- Rectifying the impacts by repairing, rehabilitating, or restoring the affected environment.
- Compensating for the impacts by replacing or providing the substitute resources or environment of at least similar value. For example, shifting the trees to similar ecosystem instead of cutting them down and giving similar shelters and job opportunities for inhabitants to be displaced.

6.1.4 Evaluation of the residual impacts

Even though incorporation of suggested mitigation measures reduces the environmental impacts of the project and brings them within the acceptable limits, this step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied.

6.1.5 Identification of monitoring requirements

The last step in the assessment process is the identification of minimum monitoring requirements. The scope and frequency of monitoring depends on the residual impacts. The purpose of the monitoring is to confirm that the impact is within the prescribed limits and to provide timely information, if there is breach of the standards.

6.1.6 Purpose of Mitigation Measures

Purpose of mitigation measures includes that what is the problem, when the problem will occur, when, where and how the problem should be addressed. The answers to these questions are given below:

6.1.6.1 What is the Problem?

As the project is the manufacturing of fertilizers so the problem can be the impacts that could likely to cause from the activities involved in construction and operation phase of the project i e air pollution, noise pollution, solid waste, wastewater generation etc.

6.1.6.2 When Problem will occur and when it should be addressed?

Problem can occur during different phases when different activities are done through machinery or manual work. These problems may include noise, solid waste, liquid waste etc. These all problems should be addressed on the spot to avoid the adverse impacts.

6.1.6.3 Where Problem should be addressed?

As the problem is generating from the construction and operational of the project so it should be addressed on source i.e. site of the project.

6.1.6.4 How the Problem should be addressed?

Proper mitigations measures are being provided according to the nature of the impacts/ problems. Details of mitigation measures are further discussed in this chapter.

6.2 Impact Evaluation and Characteristics

During the Environmental Impact Assessment of Project, the predictable environmental impacts (positive and adverse) were carefully analyzed and characterized by using Impact Screening Checklist and Project Impact Evaluation Matrix. Subsequent to the characterization, appropriate mitigation measures were identified, in order to minimize, if not completely eliminate, the adverse impacts associated with Project activities. Finally, residual impacts were also identified. The parameters used for the impact characterization are listed below:

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Table 6.1: Parameters for Impacts Characterization

Categories	Characteristics
Nature	Direct: The environmental parameters are directly affected by the Project construction or operation. Indirect: The environmental parameter changes as a result of alteration in another Parameter.
Duration of Impact	Short-term: The impacts that last only during the construction of the proposed Project e.g., noise from the construction activities. Medium-term: Lasting for a period of few months or a year. The Project before naturally reverting to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil. Long term: Lasting for period greater than medium term impact before naturally reverting to the original condition such as loss of soil due to soil erosion.
Geographical Extent	The geographical extent may be local or regional (spatial dimension)
Project Phases	Pre-Construction/Designing Construction Operational Decommissioning
Reversibility of Impact	Temporary: The impacts that don't exceed ecosystem threshold value of resilience. Permanent: The impacts that exceed ecosystem threshold value of resilience i.e., community that cannot come back to its original stage without external aid.
Likelihood of the Impact	Certain: Impact anticipated occurring under most circumstances. Likely: Impact will probably occur under most circumstances. Possibly: Impact may possibly occur during different stages of the Project.
	Unlikely: Impact could occur during most stages of the project. Rare: Impact may occur but only under exceptional circumstances
Impact Consequence Severity	Major: When an activity causes irreversible damage to a unique environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on Socio-Economic activities of significance or regional level. Moderate: When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation of a population of flora or fauna; has short-term effects (period of months) on Socio-Economic activities of significance on regional level. Minor: When an activity causes short-term (period of few months) reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term (period of months) effects on Socio-Economic activities of local significance. Negligible: When no measurable damage to physical, Socio-Economic, or biological Environment above the existing level of public concern; and conformance with

	legislative of statutory requirements.
Significance of Impact	Impact may be categorized as high, medium, or low. Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with Legislative of statutory requirements.

6.2.1 Impact Identification

In order to identify the significance of an impact, it is important to distinguish between two concepts: sensitivity and magnitude. As far as possible, the sensitivity and magnitude of the impacts are described with reference to legal requirements, accepted scientific standards or impact assessment practice and/or social acceptability. Where no known or published "***standard criteria***" exists for determining the magnitude of effects, already established professional criteria and best practices or techniques are used and clearly described. Identification and evaluation of impacts has been undertaken through number of techniques; for instance,

- Checklists
- Matrices
- Networks
- Overlays and
- GIS and Computer expert systems, etc.

An impact evaluation checklist has been used to screen out the significant potential impacts from insignificant impacts.

6.2.2 Impact Screening Checklist

The Impact Screening Checklist is developed to screen out the potentially insignificant environmental and social impacts from the potentially significant adverse environmental and social impacts during the operational phase of the Project. The objective of the Impact Screening process is to assess the significance of the issues related to the air, water, noise, soil, the hazards and external constraints of the Project. The beneficial and adverse impacts of the Project during operational phases are identified and given in the Environmental Checklist which is given below:

Table 6.2: The positive and Adverse impacts of project during operational phase

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7 ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.1 General

This chapter of the EIA provides the Environmental Management Plan (EMP) of the project for its construction and operation phases separately to keep it environment benign as well as the monitoring plan to ensure the compliance of the established EMP.

As per the environmental legislation in Pakistan, the EMP for the operation phase, along with other documents, is to be submitted to the concerned Environmental Protection Agency to obtain confirmation for compliance and Environmental Approval for project operation.

7.2 Purpose and Objectives of the EMP

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent, contractors and other staff and stakeholders.
- Provide means of effective communication of environmental issues between all the persons associated with the project.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

7.3 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

7.4 Proponent: The project proponent will take overall responsibility for compliance with the EMP in his hand. Proponent will carry out verification checks to ensure that the contractors are effectively fulfilling their environmental and social responsibilities as mentioned in EIA.

7.5 Contractors: The contractors will implement the majority of environmental and social mitigation measures. The contractors are subject to certain liabilities under the environmental laws of the country, and under contract with the proponent.

7.6 Environment Management Plan

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspects in line with the administrative framework involving all the responsible implementing

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authorities who are required to take the planned actions/measures.

Table 7.1: The Environmental Management Plan for Construction & Operation Phase

Environment Management Plan (EMP)

Environmental and social aspects	Mitigation Measures	Responsibility
Construction noise	Periodic surveys will be conducted for the control of noise level from the construction equipment, operational machinery and vehicles. Machines and vehicles will be provided with mufflers. Proper maintenance, oiling and greasing of machines at regular intervals to reduce generation of noise. Provision of PPEs (ear plugs, ear muffs) to the Workers working in high noise areas.	Construction Contractor
Dust emission	Sprinkling of water on all the exposed sites to suppress the emission of dust. Covering all the soil piles and construction Materials will be transported in closed containers.	Construction Contractor
Vehicle and equipment exhaust	Maintenance of all vehicles and other equipment used during the construction in order to minimize the emission of pollutants.	Construction Contractor
Water conservation plan	Recording of amount of groundwater that will be extracted for construction activities Strict monitoring will be in place to have an eye on all water uses so that no wastage of water takes place and where possible, water would be Recycled.	Construction Contractor
Wastewater management	Wastewater generated during the construction activities will be collected properly and routed towards septic tank for proper treatment before disposal.	Construction Contractor
Solid Waste	Identification and quantification of all waste streams Provision of separate waste bins at various locations for proper collection of different waste streams Onsite Separation of recyclable waste Hiring of waste collection contractor for its regularly collection Recording of all waste generation activities and its management	

Health and safety	Establishment of SOPs for all the project activities. Safety audits should be conducted. All accidents and incidents should be recorded, reported and reclaimed. Provision of Standardized Personal Protection Equipment (PPEs) such as ear plugs, safety Helmets, Gloves, Goggles, Masks and Gum Shoes to the employees to ensure their safety at work. Displaying Workers' awareness and safety wall chart showing safety symbols. Provision of First Aid Box in all departments. Development of comprehensive firefighting system to avoid any chance of fire that will includes all types of fire Extinguishers, fire hydrants, sand Buckets and fire fighting Vehicles. Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues in the industrial premises. Provision of free medical facilities and services to the employees.	Construction Contractor
Soil contamination	During maintenance of vehicles and equipment, tarpaulin or other impermeable material should be spread on ground to prevent contamination Regular inspection should be carried out Fuels, lubricants and chemicals should be stored in covered banded areas Contaminated soil should be collected and disposed off safely	Construction Contractor
Hazardous and non-hazardous solid waste management	Reuse of construction and demolition waste (bricks, cement, etc.) for flooring. Municipal waste will be managed using procedures established in the industrial estate. Record of all waste generated during the Construction phase will be recorded.	Construction Contractor & Waste Contractor
	Operation Phase	
Noise	Silencing and proper muffling of operating equipment Preventive maintenance and regular servicing and tuning of the equipment will be assured. Workers should be told and encouraged to use PPEs (ear plugs or ear muffs) at all times. Tree plantation will be done to reduce noise level.	Operation and Maintenance staff

Exhaust and Dust emission	Proper ventilation will limit the amount of indoor pollutants and will assure the supply of clean air at all times to all the workers inside. Closed operations will keep the emission of air pollutants within PEQS limits. Scrubbers will be installed to control dust emissions Provision of PPEs to the workers before entering into the working vicinity. Practicing water spraying where required. Regular monitoring of air emission sources. No open burning of waste within the premises of project site.	Operation and Maintenance staff
Water conservation plan	Recording the amount of groundwater that will be extracted for operation activities. Strict monitoring will be in place to have an eye on all water uses so that no wastage of water takes place and where possible, water would be Recycled.	Operation and Maintenance staff
Wastewater Management	Proper domestic waste water collection will be done through a network of pipeline and routed towards the septic tank and finally used for watering of the plantation area after necessary treatment	Operation and Maintenance staff
Soil contamination	Provision of dense greenbelt within the premises of factory. Maintenance of impervious flooring and roof covers in order to avoid land contamination due to accidental spills. Regular maintenance of machinery and equipment to avoid any spillage	Operation and Maintenance staff
	Establishment of SOPs for all the project activities. Conducting Safety audits. Recording and Reporting of all accidents and incidents. Preventive approach will be preferred to corrective approach. Provision of Standardized Personal Protection Equipment (PPEs) such as ear plugs, safety Helmets, Gloves, Goggles, Masks and Gum Shoes to the employees to ensure their safety at work place. Workers' awareness and safety wall chart showing safety symbols will be displayed. Availability of First Aid Box in every department which will be within easy approach	Operation and

Health and safety	of all in case of any injury or mishap. Development of a comprehensive firefighting system including all types of fire Extinguishers, fire hydrants, sand Buckets and fire fighting vehicles to avoid any chance of fire Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues in the industrial Premises. Provision of free medical facilities and services to the employees.	Maintenance staff
Energy Management	Energy audit must be conducted. Energy leakages should be immediately noted, reported and sorted out. Repair and recovery measures should also be adopted. Attempts shall be made to bring into use the renewable resources to the extent possible and practicable.	Operation and Maintenance staff
	Decommissioning Phase	
Soil Disturbance	Scheduling to avoid heavy rainfall periods to the extent practical. Mulching to stabilize exposed areas.	Operation and Maintenance staff
Solid Waste Generation	Timely collection and disposal of solid waste. Recyclable waste should be sell out to the recycle market or any relevant customer.	Operation and Maintenance staff
Health and Safety Issues	Employees should be provided with personal Protective equipment.	Operation and Maintenance staff

7.6.1 Roles and Responsibilities for Environmental Monitoring

Table 7.2: The Roles and Responsibilities for Environmental Monitoring

Aspects	Proponent Responsibilities	Contractors Responsibility	Relevant Documentation
Contracting	Ensure that the monitoring, rehabilitation and rebuilding requirements are included in the contract between the proponent and the construction contractor.	Understand the environmental requirements of the contract.	Contract between th proponent and th contractor
Monitoring plan	Finalize the monitoring plan prior to the commencement of the Construction.		Revised monitoring plan

Resources	Ensure the availability of resources for Environmental responsibilities; monitoring, rehabilitation and rebuilding.	Ensure the availability of resources for environmental monitoring, rehabilitation and rebuilding and their efficient use without Wastage.	Project budget
Environmental staff	Designate an Environmental manager for the project.	Appoint officer dedicated to Environment.	Job description
Monitoring survey	Undertake the periodic (pre-planned and unplanned) inspection and carry out the field measurement or assign this duty to a concerned person or organization.	Systematically observe and collect the data on the environmental performance.	Inspection survey reports
Environmental Audit	Conduct periodic audits of the construction site and commence third party	Conduct audits.	Audit reports
	Audit.		
Reporting	Ensure that periodic environmental monitoring reports are received.		Periodic reports
Corrective action	Verify that activities are carried out complying with EIA/EMP.	Carry out the corrective actions where required.	Corrective a record
Maintenance of record	Maintain monitoring data and record of all incidents of environmental significance.	Maintain monitoring data and record of all incidents of Environmental significance.	Environmental base

7.6.2 Communications and Documentation

An effective mechanism to store and communicate environmental information during the project an essential requirement of an EMP.

7.6.2.1 Meetings

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

7.10 Environmental Budget

Table 7.5: The cost breakup of Environmental Budget

Environmental Budget

Sr. No.	Item/Activity		Quantity (No. s)	Budget (PKR)	Description
1	Plantation Campaign		1000	500,000/-	Cost includes plantation and maintenance up to 5 years
2	Total Cost of EMMP		-	600,000/-	For Construction and Operational Phases
3	Environmental Monitoring	Air Quality Monitoring	02	40,000/-	2 samples @ 20,000/- per sample
		Noise Level Monitoring	02	20,000/-	2 samples @ 10,000/- per sample
		Drinking Water Analysis	02	20,000/-	2 samples @ 10,000/- per sample
4	Miscellaneous		-	120,000/-	Lump sum
5	**Total Environmental and Social Management Cost**			**1300,000/- (1.3 Million)**	

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusion

The report presents Environment Impact Assessment of the project M/S Safi Chemicals & Fertilizers (Pvt.) Ltd. The main objective for the installation of Sulphur 80% WDG is the manufacturing of fertilizers by using environmental friendly technology for the manufacturing.

The performed EIA showed all the possible impacts (both positive and negative) associated with the construction and operation of the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these can be brought within acceptable, safe limits. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. Based on overall assessment of the environmental impacts of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented. Moreover, the identified impacts have been found to be of temporary nature; leaving no long-term, residual impacts behind.

This Environmental Impact Assessment has been conducted, to the extent possible, in line with the relevant guidelines provided by the Environmental Protection Agency. The objective of such a study is to identify and assess potential environmental and socio-cultural impacts of the project. The Environmental Impact Assessment contains description of the project, description of the environmental baseline, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is also included in the study, developed separately for construction and operation phases. For compliance checks of the EMPs, Environmental Monitoring Plans have also been developed.

On the basis of all the above conclusions and the fact that the project is going to have a benefit/cost ratio above one for both environmental and socioeconomic concerns, this project is found to be environmentally feasible. Since, conservation, reduction, reuse, recycling, treatment and recovery techniques have all been planned to be practiced for both material and energy resources with the aim to reduce footprint of the industrial processing,

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the project can also be declared to be sustainable.

It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. It is accordingly recommended that environmental approval for the project may be issued by the Environmental Protection Agency, subject to the payment of the requisite scrutiny fee by the proponent of the project.

8.2 Recommendations

Following are some recommendations to improve the environmental status of the project:

- All the parameters of discharges and emissions of the project shall be within prescribed limits.
- No activity should be undertaken at the project site which may cause leakage and spillage of oils, chemicals and fuels into adjoining grounds;
- No activity should be undertaken at the site which could pose any sort of a threat to public health.
- Workers should be provided with adequate and standardized PPEs like ear muffs, goggles, gloves and shoes etc.
- Workers should be told and encouraged to use PPEs.
- Training schedules should be strictly followed;
- Separate parking spaces should be demarcated at the project site for parking of vehicles;
- Trained drivers should be hired for transportation and they should be told and encouraged to observe traffic rules;
- Establishments shall be regularly advised to keep noise levels within acceptable limits.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods;
- Small waste storage bins should be installed at different corners for proper waste collection of solid waste.
- An area designated for sorting of the solid waste must be constructed;
- Wages should be distributed on time;
- Wages should not be below minimum wages as prescribed;

- Proper ventilation must be in place;
- Proper tree plantation plan has been developed in order to make the unit environment friendly.
- The use of air filters can trap most of the air pollutants, so it should be encouraged;
- Obligatory insurance should be provided to work laborers against accidents.
- Basic medical training should be provided to the specified work staff and basic medical service and supplies to workers.
- Flammable materials should be prohibited in the warehouse premises.
- Stop the source of the spill or any other accident immediately;
- Track and root out the causes of any accident or spill;
- The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and urgent support.

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