

Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084

E-mail: Hqssteels786@gmail.com, ppm ltd@hotmail.com Web: www.premiergroup.pk

March 27, 2018

Registrar
National Electric Power Regulatory Authority
2nd Floor, OPF Building G 5/2
Islamabad

**Subject: - APPLICATION FOR THE MODIFICATION OF
GENERATION LICENSE No.SGC/124/2018 DATED
23.02.2018 FROM 7 MW TO 15 MW OF PREMIER
INDUSTRIAL CHEMICAL MANUFACTURING
COMPANY PRIVATE LIMITED**

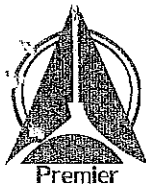
Dear Sir,

We, do hereby authorize Mr. Riaz Tahir, Sr. Sales and Marketing Manager as representative of Premier Chemical Manufacturing Company Private Limited by virtue of Board Resolution dated 22 March 2018 for filing of application of modification of Licence No.SGC/124/2018 dated 23.02.2018 from 7 MW to 15MW to National Electric Power Regulatory Authority pursuant to section 10 of part – III of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations 1999.

The following documents are enclosed for your kind perusal:

- 1-Statement of the reasons in support of the modification
- 2-Copy of Board Resolution
- 3-Changes in Schedule I attached as revised Schedule I
- 4-Changes in Schedule II attached as revised Schedule II
- 5-Acknowledgement from EPA

We do hereby certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provision of the National Electric Power Regulatory Authority Licensing (Application



Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084

E-mail: Hqsteels786@gmail.com, ppm ltd@hotmail.com Web: www.premiergroup.pk

and Modification Procedure) Regulations 1999, and undertake to abide by the terms and provisions of the above said regulations. We further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of our knowledge and belief.

B.C. No.19868092 dated 27.03.2018 amounting to Rs.152,448 (Rupees on Hundred Fifty Two Thousand Four Hundred and Forty Eight Only) as the application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations 1999, is also attached.

Kindly consider our request sympathetically at earliest possible.

Thanking you.

Yours Sincerely,

For Premier Industrial Chemical Manufacturing Co. (Pvt) Limited

Riaz Tahir

Sr. Manager Sales & Marketing



Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084

E-mail: Hqsteels786@gmail.com, ppm ltd@hotmail.com Web: www.premiergroup.pk

April 2, 2018

Registrar

National Electric Power Regulatory Authority

2nd Floor, OPF Building G 5/2

Islamabad

**Subject: - APPLICATION FOR THE MODIFICATION OF
GENERATION LICENSE No.SGC/124/2018 DATED
23.02.2018 FROM 7 MW TO 15 MW OF PREMIER
INDUSTRIAL CHEMICAL MANUFACTURING
COMPANY PRIVATE LIMITED**

Dear Sir,

This is with reference to your letter No: NEPRA/R/LAG-359/5080, dated 30.03.2018 wherein it has been desired to submit some of the missing information pertaining to the subject matter as required as per the relevant regulation. In this regard, our submissions are detailed below:-

(a). "Text of the Proposed Modification" the Authority granted us a generation license for a total installed capacity of 7.00 MW to 15.00 MW by addition of another Steam turbine as stated in the statement for "Reason in Support of Modification". The Authority allowed supplying to two (02) Bulk power consumers (BPCs) however, we plan supplying to a sister concern instead of an existing BPC as explained in the said statement.

(b). "A Statement of the Impact on the Tariff, Quality of Service and the Performance of the Licensee of its obligation under the license" it is stated that the proposed enhancement in capacity will not affect any of the said parameters.



Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084

E-mail: Hqsteels786@gmail.com, ppmtd@hotmail.com Web: www.premiergroup.pk

The above submissions are being in the subject matter and it is expected that the same will suffice for processing of our subject LPM already submitted vide our letter, dated 27.03.2018.

Thanking you.

Yours Sincerely,

For Premier Industrial Chemical Manufacturing Co. (Pvt) Limited

Riaz Tahir

Sr. Manager Sales & Marketing

**STATEMENT OF THE REASONS IN SUPPORT OF THE
MODIFICATION**

We intend to install one brand new condensing and extraction steam turbine along with matching generator 8 MW capacity. With the installation of new condensing and extraction steam turbine in the existing power house of our factory the power generating capacity will increase from 7.0 MW to 15 MW, that will enable us to supply surplus electricity to our sister concern H Q Steels (Pvt) limited after proper arrangements.

Another modification, we will supply electricity to our associated concern H Q steels (Pvt) Limited instead of Ghani Value Glass Limited, is required.



Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084
E-mail: Hqsteels786@gmail.com, ppm ltd@hotmail.com Web: www.premiergroup.pk

RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF M/S PREMIER INDUSTRIAL CHEMICAL MANUFACTURING COMPANY (PVT) LIMITED IN THE MEETING HELD ON THURSDAY 22 , 2018 AT REGISTERED OFFICE, 23 AHMED BLOCK, NEW GARDEN TOWN LAHORE.

RESOLVED that Mr. Riaz Tahir Sr. Manager Sales and Marketing is hereby authorized on behalf of the Company to apply to the National Electric Power Regulatory Authority, the modification of License No.SGC/124/2018 dated 23.02.2018 of 7 MW to 15 MW

FURTHER RESOLVED that a certified copy of the Resolution duly attested by the Company Secretary be furnished to the concerned.

Specimen Signature of the Authorized

RIAZ THAHIR

Sr. Manager Sales & Marketing

Certified to be true Copy

Mehdi Raza Java

Company Secretary:

SCHEDULE – I

(REVISED)

Modification-I

The Location, Size (i.e. Capacity in MW), Type of Technology, Technical Limits, Technical/Functional Specifications and other details specific to the Generation Facilities of the Licensee are described in this Schedule.

Details
Of the Generation Facilities /
Power Plant

(A) General Information

(i).	Name of Applicant	Premier Industrial Chemical Mfg. CO.(Pvt.) Ltd.
(ii).	Registered / Business Office	23 – Ahmad Block, New Garden Town, Lahore.
(iii).	Plant Location	9 th Kilometer Sheikhpura Lahore Road, Sheikhpura.
(iv)	Type of Generation Facility	Biogas + Biomass fired Thermal Power Plant

(B) Plant Configuration

(i)	Plant Size Installed Capacity (Gross ISO)	15 MW	
(ii)	Type of Technology	Steam Turbine	
(iii)	Number of Units / Power (MW)	Unit - 1	Unit – 2
		7 MW	8 MW
(iv)	Unit Make & Model	Unit – 1	Unit – 2
		Triveni Turbine India 2015 – 2016.	Triveni Turbine India 2017 – 2018.
(v)	Commissioning / Commercial Operation Date	Unit – 1	Unit – 2
		December 2016	April 2018

(C) . Fuel / Raw Material Details.

(i).	Primary Fuel	Biogas	
(ii).	Alternate Fuel	Rice Husk, Baggase, Natural Gas and Coal	
(iii)	Fuel Source (Imported / Indigenous)	Primary Fuel	Alternative Fuel
		Indigenous	SNGPL + Local Suppliers.
(iv).	Fuel Supplier	Primary Fuel	Alternative Fuel
		Premier Industrial Chemical Mfg. CO. (Pvt.) Ltd.	From Local Suppliers.
(v).	Supply Arrangement	Primary Fuel	Alternative Fuel
		Through Gas Pipeline.	Through Pipeline and Trucks / Tractor Trollies.
(vi).	No. of Storage Tanks	Primary Fuel	Alternative Fuel
		Through Pipeline.	Through Pipeline and Bulk Storage.
(vii.)	Storage Capacity of Each Tank	Primary Fuel	Alternative Fuel
		Through Pipeline.	1000 ~ 20000 M. Tons.
(viii).	Gross Storage	Primary Fuel	Alternative Fuel
		Through Pipeline.	1000 ~ 20000 M. Tons.

(D). Emission Values.

(i).	SO _x (mg / Nm ³)	Primary Fuel	Alternative Fuel
		200 mg/Nm ³ ~ 1000 mg/ Nm ³	350 p.p.m.
(ii).	NO _x (mg / Nm ³)	Primary Fuel	Alternative Fuel
		350 mg/Nm ³ ~ 450 mg/Nm ³	150 p.p.m.
(iii).	CO ₂	Primary Fuel	Alternative Fuel
		8% ~ 10%	8% ~ 10%
(iv).	CO (mg / Nm ³)	Primary Fuel	Alternative Fuel
		NIL	50 ~ 80 p.p.m.
(v).	PM ₁₀	Primary Fuel	Alternative Fuel
		5 mg/Nm ³ ~ 10 mg Nm ³	450 mg/m ³ ~ 550 mg/m ³

(E) . Cooling System

(i).	Cooling Water Source / Cycle	Water Turbine / tube Wells installed at Plant Site / Close Loop
------	------------------------------	---

(F). Plant Characteristics

(i).	Generation Voltage	11 KV
(II)	Frequency	50Hz
(iii)	Power Factor	0.8 Lagging
(iv).	Automatic Generation Control (AGC)	AVR & Wood Wards Governor for Generator Voltage & Frequency Control System
(v).	Ramping Rate	5%
(Vi).	Time Required to synchronize to Grid and loading the complex to full load.	Synchronize to Grid with power house. 01 ~ 02 Hrs/for full load run after cold start 3~4 hrs /Time for synchronize after Generator is started 05~30 Sec.

SCHEDULE-II

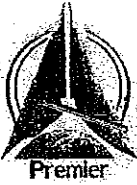
(REVISED)

MODIFICATION-I

The installed/ISO Capacity (MW), De-Rated Capacity At Mean Site Conditions (MW), Auxiliary Consumption (MW) and the Net Capacity At Mean Site Conditions (MW) of the Generation Facilities of Licensee is given in this Schedule.

SCHEDULE – II

1.	Installed Capacity Gross ISO	15 MW
2.	De – Rated Capacity at Mean Site Condition	14 MW
3.	Auxiliary Consumption	9 MW
4.	Net Capacity of the plant at Mean Site Conditions	05 MW



Premier Industrial Chemical MFG Co (Pvt) Ltd.

23 Ahmed Block, New Garden Town, Lahore, Pakistan Tell: 92423558 5717, Fax: +92 423586 6084
E-mail: Hqsteels786@gmail.com, ppmild@iolmail.com Web: www.premiergroup.pk

Director General,
EPA Punjab,
Lahore.

February 14, 2018

**FILING OF INITIAL ENVIRONMENTAL EXAMINATION REPORT TO OBTAIN ENVIRONMENTAL
APPROVAL UNDER SECTION 12 OF PEPA (AMENDED 2012) FOR INSTALLATION OF 8 MW
STEAM TURBINE LOCATED AT 9-KM LAHORE ROAD, SHEIKHUPURA**

Sir,

Enclose herewith please find printed and electronic copies of IEE report of 8 MW Steam Turbine located at 9-km Lahore Road, Sheikhupura

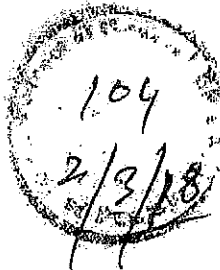
Also find enclosed with this letter the Demand Draft of PKR 15,000 made in favor of the Director General EPA (Punjab) on account of IEE Review Fee. Dated 14-2-2018 Pay Order No 19843758 Bank Habib Bank Limited, Upper Mall, Lahore (1242)

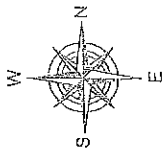
It is requested to kindly review the Report and accord the necessary approval for the titled above project.

Thanking You.

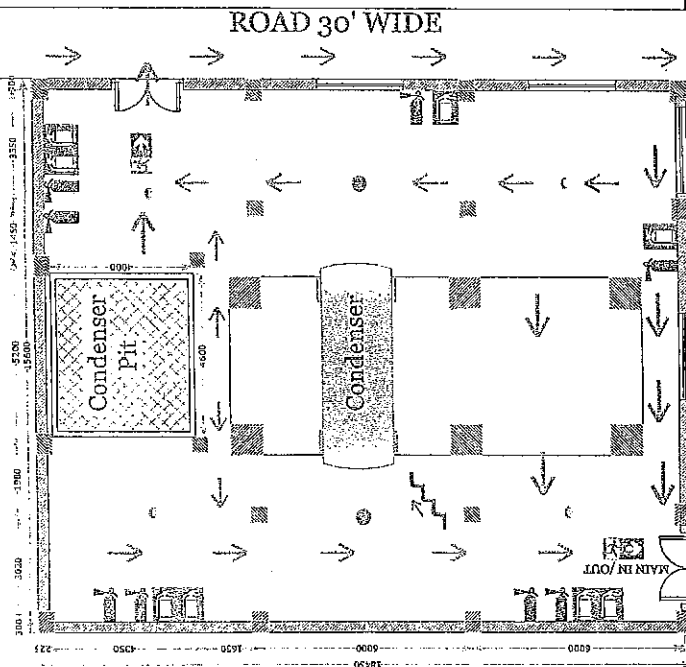
Yours Truly,

Muhammad Saeed
Proponent
Premier Industrial Chemical Mfg.
Co. (Pvt.) Ltd.



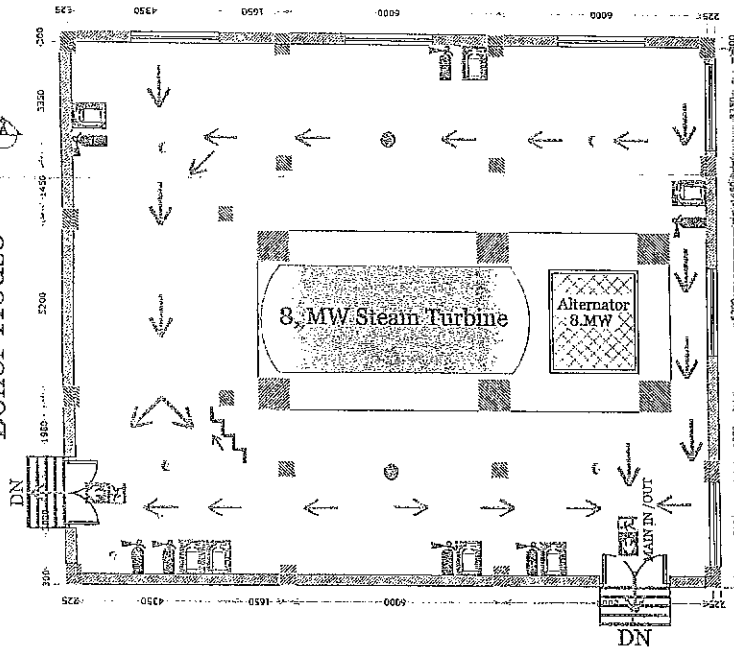


Existing Building
Boiler House



Existing Building

Existing Building
Boiler House


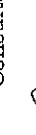



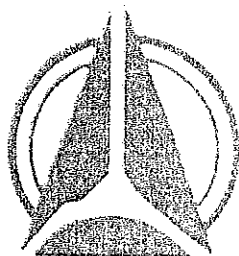
First Floor
SCALE 1/1mm

LEGEND :

↑	Primary Exit Route
☒	Fire Extinguisher
☒	Fire Extinguisher
☒	Smoke Alarm
☒	Fire Alarm
☒	Exit
☒	Emergency Assembly Area

Ground Floor
SCALE 1/1mm

PROJECT	TITLE	<div><div>M. MUSTAFA Consultant</div><div></div></div>	Owner's <div></div>	AREA CALCULATION		
PREMIER INDUSTRIAL CHEMICAL MANUFACTURING COMPANY PVT.LTD 9KM, LAHORE ROAD SHEIKHUPURA.	SAFETY LAY OUT PLAN FOR 8. MW STEAM TURBINE			SQUARE NO-9 KILLA NO-15		
				SPACE (in sq.m.)		
				TOTAL GROUND FLOOR AREA 287.82		
				TOTAL FIRST FLOOR AREA 287.82		
		DATE		08-01-2018		



PREMIER

INITIAL ENVIRONMENTAL EXAMINATION REPORT

for

CAPACITY ENHANCEMENT OF EXISTING POWER PLANT AT
PREMIER INDUSTRIAL CHEMICAL MFG. CO. (PVT.) LTD BY
INSTALLATION OF 8 MW STEAM TURBINE

Located at 9 km Lahore Road, District Sheikhupura

Signature

Muhammad Saeed

Signature

ECOGREEN

Environmental Lawyers, Engineers & Consultants

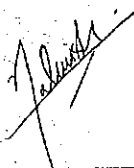
Ecogreen Company (Pvt.) Limited
Off: 233-Rewaz Garden, Lahore.
E-mail: info@ecogreen.com.pk

Lahore | Islamabad | Faisalabad | Karachi
Ph: 042-37171189, 37116007, 37115518
Mob: 0320-8483000, 0322-8483000

It is accordingly recommended that Environmental Approval for the project should be by the Punjab Environmental Protection Agency, subject to payment of the requisite fee by the Proponent of the Project

The main key persons involved in finalizing IEE report are following;

Prepared By



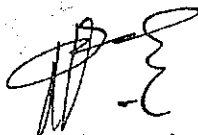
Mehwish Khan
Environmental
PU, Lahore

Verified By



Engr. Hira Iqbal
Environmental Eng
UET, Lahore

I have reviewed the project IEE report and found the contents to be valid and true to the best of knowledge and belief.



Muhammad Saeed

Proponent

Premier Industrial Chemical Mfg. Co.
(Pvt.) Ltd.

TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	6
1. INTRODUCTION	14
1.1 PURPOSE OF REPORT.....	14
1.2 IDENTIFICATION OF PROJECT & PROPONENT	14
1.2.1 Identification of Project.....	14
1.2.2 Proponent	14
1.3 DETAILS OF CONSULTANT.....	15
1.4 PROJECT NATURE, SIZE AND LOCATION.....	16
2. DESCRIPTION OF THE PROJECT	17
2.1 TYPE AND CATEGORY OF PROJECT	17
2.2 PROJECT OBJECTIVES	17
2.3 ALTERNATIVES.....	17
2.3.1 Site Alternative	17
2.3.2 Project Alternative.....	18
2.4 PROJECT DESCRIPTION	18
2.4.1 Turbine and its Auxiliaries	19
2.4.2 Electrostatic Precipitator.....	19
2.4.3 Condenser.....	19
2.4.5 Fuel Requirement.....	19
2.4.6 Water Requirement and Source.....	19
2.4.7 Resources and Utility Demand	20
2.4.8 Green Area/Landscaping	20
2.4.9 Firefighting and Emergency Plan.....	20
2.5 PROCESS DESCRIPTION	20
2.6 PROJECT AREA.....	21
2.7 Manpower	21
2.8 LOCATION AND SITE LAYOUT OF PROJECT	21
2.9 LAND USE OF SITE.....	21
2.10 ROAD ACCESS	21
2.11 VEGETATION FEATURES OF THE SITE	22
2.12 COST OF PROJECT.....	22
2.13 COST AND MAGNITUDE OF OPERATION	23
2.14 SCHEDULE OF IMPLEMENTATION	23
2.15 RELOCATION AND RESETTLEMENT PLAN	23
2.16 SITE RESTORATION PLAN	23
2.17 GOVERNMENT APPROVALS.....	24
3. DESCRIPTION OF THE ENVIRONMENT	25
3.1 Methodology.....	25
3.1.1 Data Collection.....	25
3.1.2 Social Survey	25
3.1.3 Sampling Design	26

LIST OF FIGURES

Figure 1: Location of Project Site.....	16
Figure 2: General Process of Power Generation	21
Figure 3: Road Access	22
Figure 4: Location of the City	28
Figure 5: Annual Mean Temperature (Source: Climate-Data.org)	29
Figure 6: Average Annual Precipitation (Source : Meteoblue)	29
Figure 7: Average Wind Speed (Source: Meteoblue).....	30
Figure 8: Seismic Zones of Pakistan	31
Figure 9: Nearby Residential Areas	36
Figure 10: Occupation of Respondents	39
Figure 11: Personal Income	39
Figure 12: Literacy Rate.....	40
Figure 13: Nearby Industries	41

LIST OF TABLES

Table 1: List of Experts	15
Table 2: Quantity of Fuel to be used in Power Generation.....	19
Table 3: Breakdown of Cost	22
Table 4: Inventory of the Trees Present in Sheikhpura District.....	32
Table 5: Mammals in the Study Area	32
Table 6: Birds in the Study Area.....	33
Table 7: Reptiles in the Study Area	33
Table 8: Amphibians in the Study Area	33
Table 9: Insects in Study Area	33
Table 10: Sampling Sites Details.....	34
Table 14: Study Area (Village Profile).....	37
Table 15: Concerns and Solutions	42
Table 16: Impact Significance Criteria.....	48
Table 17: Impact Screening Checklist (Construction Phase).....	49
Table 18: Impact Screening Checklist (Operational Phase).....	49
Table 19: Impact Assessment (Construction Phase)	50
Table 20: Impact Assessment (Operational Phase)	50
Table 21: Environmental Management Plan	66
Table 22: Environmental Monitoring Plan For Construction And Operational Phase	84

ANNEXURES

ANNEXURE I:	Glossary
ANNEXURE II:	Abbreviations
ANNEXURE III:	Layout Map of Project
ANNEXURE IV:	Terms of References
ANNEXURE V:	Specifications of Steam Turbine
ANNEXURE VI:	Socioeconomic Survey Forms
ANNEXURE VII:	Authority Letter
ANNEXURE VIII:	Proponent CNIC
ANNEXURE IX:	List of Experts
ANNEXURE X:	Property Documents
ANNEXURE XI:	Fire Fighting Layout Plan
ANNEXURE XII:	NOC
ANNEXURE XIII:	References

EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the findings of the Initial Environmental Examination Report for Installation of 8 MW Steam Turbine located at 9 km Lahore Road, District Sheikhpura. The proposed project is capacity enhancement of existing power plant by additional installation of 8 MW Steam Turbine. To fulfill the statutory requirements, Initial Environmental Examination of the proposed project has been conducted in accordance with the Punjab Environmental Protection Act 1997 (Amended 2012) and IEE/EIA Regulations 2000. The process of conducting environmental assessment and the results of IEE are described in this document.

SALIENT FEATURES OF PROJECT

Proponent Name	Muhammad Saeed
Project Title	Installation of 8 MW Steam Turbine
Project Capacity	8 MW
Project Location	9 km Lahore Road, District Sheikhpura Co-ordinates: 31°41.93'N 74°3.01'E
Cost of Project	PKR 140.6 Million
Area of the Project	287.82 m ²
Nature of the Area	Industrial
Source of Water	Ground Water (550 ft)
Water Requirements	1500 m ³ /d

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

Wastewater	Boiler blowdown and cooling tower blowdown will be generated from the proposed project. Wastewater will be treated in already installed effluent treatment plant (ETP) of Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd and then disposed in Bharianwala drain.
Air Emissions	Flue gases will be released from boiler. Electrostatic precipitator will be installed to reduce air flue gas emissions.
Source of Power	WAPDA and existing 7 MW Steam Turbine
Solid Waste	Domestic solid waste will be generated and managed as per area's management practices.
Sensitive Receptors	
Nearby Habitation	Shahbaz Pura (8.5 km) Ahata Wakeel Wala (8 km) Chichon-ki-Mallian (9.5 km) Hariya Tibbi (4 km) Bhatti Dhalwan (7.3 km) Sahoki Malian (5.4 km) Joeiyanwala More (5.8 km) Zafar Abad (4.6 km) Rao Mazhar Town (4.3 km) Defence Colony (5.7 km) Housing Colony (4.7 km)

Nearby Public Facilities	Sultan Hospital Pvt. (1.5 km) Civil Hospital (5.06 km) Social Security Hospital (2.05 km) Punjab Public School (2.03 km) Govt. Woman College (2.06 km) Govt. Boys College (2.1km)
Nearby Industries	AHN Steel (1.4km) Tariq Glass Industries (2 km) Olympia Carpets (4.5 km) ICI Polyester (2 km) Ghani Float Glass Mills (1.21 km) Rupali Polyester Ltd (1.28 km) Ayesha Textile Mills (1.6 km) Pakistan Spring and Engineering Company (2 km)
Archaeological/Historically Important Site	None within the 10 km radius
Surface Water Body	No surface water body in the form of river or canal is present near the project site
Forest Area/National Park	None
Seismicity	2A-Medium Intensity Level

PROJECT OBJECTIVES

The objectives of the proposed project are to:

- Enhance the capacity of existing power plant by additional installation of 8 MW Steam Turbine.
- Reduce the emissions of greenhouse gases (GHG) by using biomass (biogas and rice husk) for power generation.
- Increase efficiencies in terms of energy, utilities consumptions and production.

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

- Improve the efficiency of power generation.
- Fulfill the power demands by supplying timely and uninterrupted power supply.
- Create new employment opportunities as a part of the project activities scope opportunity.

DESCRIPTION OF THE PROJECT

The project includes installation of 8 MW Steam Turbine in Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd. The total area for the proposed project would be 287.82 m². The proposed construction will be carried out besides existing building. Co-firing can play an important role to increase the use of biomass in power generation and reduce the emissions of greenhouse gases (GHG). Combustion of the fuel produces steam in the boiler that powers a turbine/generator to generate electricity. The steam is then returned to the liquid state in a condenser by circulating cooling water around the condenser tubes containing the steam. The condensate is then pumped back into the boiler as feed-water to be used again. The following major components shall be included in the proposed plan:

- Turbine
- Generator
- Cooling Tower
- Ash handling and ash disposal area
- Fuel Storage Area (open and covered)

ALTERNATIVES

Site Alternative

The proposed unit will be located at 9 km Lahore Road, District Sheikhupura. The site is considered suitable because of the following features:

- The proposed site falls under the jurisdiction of the proponent and has been acquired for installation of 8 MW Steam Turbine. It has been observed to be almost level in topography.

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

- The site is located inside the already existing industry. Hence, it is suitable to provide power for the industrial processes.
- Existing power plant has Environmental Approval from EPA Punjab.
- Availability of infrastructure facilities such as water supply, power, roads, social infrastructure and man power.
- No national park or wildlife habitat falls within 10 km radial distance from proposed project site.
- The site is not dangerous for public safety.
- No endangered fauna/flora has been observed near the project site.
- The proposed site does not fall in any category of protected or environmentally sensitive area.

The location of project is best suited for proposed activities. So no alternative for site is analyzed.

Project Alternative

Most industries purchase electricity from electric utilities or independent power producers. Premier Group is leading supplier of various products that include Chemical, Dairy and Paper. To cope up with increasing market demand and to be competitive, Premier Group intends to install a steam turbine to generate power. No project alternative is considered as the proposed project is going to fulfill the power demands through upgrading the existing power plant by supplying timely and uninterrupted power supply for the industrial processes. The proposed project is going to be installed in already established industry so no other land acquisition is required.

SCREENING

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the proposed construction falls in Schedule I-IEE **category B (2)**.

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES**Assessment of the Impacts during Construction**

While the project's construction poses certain environmental risks, these are short term, and/or easily reversed. The major effects expected during the construction phase include: soil pollution caused by spillage from construction machinery; surface/ground water contamination as well as minimal levels of air and noise pollution. There is also expected to be an increase in the congestion of vehicular traffic and solid waste, however these negative impacts are short term. Positive impacts highlighted include the social benefits of workers influx and the micro-economic development this will induce in the local area.

Mitigation Measures

- A management system for the control of vehicular emissions to be instituted.
- All loose material to be kept on site for the shortest possible time and provided with suitable covering.
- Ambient air quality within the premises of the proposed project site to be monitored.
- Implement good working practices to minimize noise and also reduce its impacts on human health (ear muffs, safe distances, enclosures).
- No machinery to be running when not required.
- Acoustic mufflers/enclosures to be provided.
- All solid waste to be appropriately disposed of in drums or specified containers.
- No untreated discharge to be leaked to surface water, groundwater or soil.
- Care taken in disposing wastewater generated such that soil and groundwater resources are protected.

Assessment of the Impacts during Operation

During operational phase of the power plant, no process wastewater will be generated other than blowdown of boiler and cooling tower. Flue gases will be released from boiler. Noise can be an issue due to operation of boiler and turbine. Burning of fuels (rice husk) in boiler will produce ash. Several

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

positive impacts can be identified as a result of the construction of proposed project in the area, including; employment opportunities, enhancement of public health and safety and induced development.

Mitigation Measure

- No untreated discharge will be leaked to surface water, groundwater or soil.
- Care shall be taken in disposing wastewater generated, such that soil and groundwater resources are protected.
- Blow down of boiler and cooling tower will be treated in already installed ETP of Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.
- Electrostatic precipitator will be installed to reduce flue gases.
- Ash will be handled accordingly and will be used for land filling near project area.
- Fire protection and safety measures will be adopted to take care of fire and exposure hazards, to be assessed and steps will be taken for their prevention.

PROPOSED MONITORING

During construction phase ambient air quality for dust level in particular, vehicle and equipment exhaust, noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored.

During operational phase housekeeping, environmental monitoring, tree plantation and management of fire-fighting gadgets is required.

ENVIRONMENTAL CONSULTANTS

Initial Environmental Examination report has been prepared to identify and assess the significant environmental impacts likely to occur due to operation along with environmental impact statement followed by delineation of appropriate Environmental Management Plan as well as the monitoring requirements to have a control over the adverse environmental impacts and to check the efficiency and effectiveness of the mitigation measures being implemented. Proponent has engaged **M/S ECOGREEN Company (Pvt.) Ltd.** to conduct IEE of the proposed project to meet the above mentioned targets, and to get Environmental Approval from Environmental Protection Agency (EPA) Punjab.

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

CONCLUSION

The Initial Environmental Examination 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 for both construction and operation phase has also been included in this study. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these can be within acceptable limits. 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.

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

1.1 PURPOSE OF REPORT

The main objectives of this IEE study are:

- To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the proposed project in that area.
- To identify pre construction, construction and operational activities and to assess their impacts on environment.
- Provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- To provide an opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.
- Prepare an IEE Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

1.2 IDENTIFICATION OF PROJECT & PROPONENT

1.2.1 Identification of Project

The proposed project is the "Installation of 8 MW Steam Turbine". The proposed project site is located at 9 km Lahore Road, District Sheikhpura.

1.2.2 Proponent

Name: Muhammad Saeed
Address: 9-km Lahore Road, Sheikhpura
Phone: 056-3543834

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

1.3 DETAILS OF CONSULTANT

Ecogreen Company (Pvt.) Ltd is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions.

Ecogreen provides the environmental services, litigation and consultancy to clients both industry and government. Ecogreen is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision
- WWTP Commissioning and Operations
- Environmental Training
- Environmental Audits
- Environmental Litigation
- Clean Development Mechanism (CDM) Proposals
- ISO certification
- Environmental / SMART Portfolio management

For the preparation of the IEE Report of the proposed project, the proponent has hired the services of the environmental consultants; **M/S Ecogreen Company (Pvt.) Ltd.** Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report. The following table lists the names of experts involved in the making of IEE report:

Table 1: List of Experts

Sr. #	Name	Qualification
Team Leader		
i.	Mehwish Khan	M.Phil. Environmental Sciences
Environmental Engineers		
ii.	Hira Iqbal	M.Sc Environmental Engineering (Scholar)

iii.	Bilal Khan	B.Sc. Environmental Engineering
Environmental Scientist		
vi.	Leenah Maqbool	M.Phil. Environmental Sciences
v.	Maryam Ijaz	M.Phil. Environmental Sciences
vi.	Adnan Naeem	M.Sc. Environmental Sciences & M.Sc. Analytical Chemistry
vii.	Azka Anwar	BS Environmental Sciences
viii.	M. Waqas	BS Environmental Sciences[MA1]

1.4 PROJECT NATURE, SIZE AND LOCATION

Project Nature: The proposed project is the construction/installation of 8 MW Steam Turbine. Biogas and rice husk will be used as fuel to generate steam for industrial processes.

Project Size: The capacity of the proposed project is 8 MW of power.

Location: The proposed project site is located at 9 km Lahore Road, District Sheikhupura. The geographical location of the project is at 31°41.93'N 74°3.01'E.

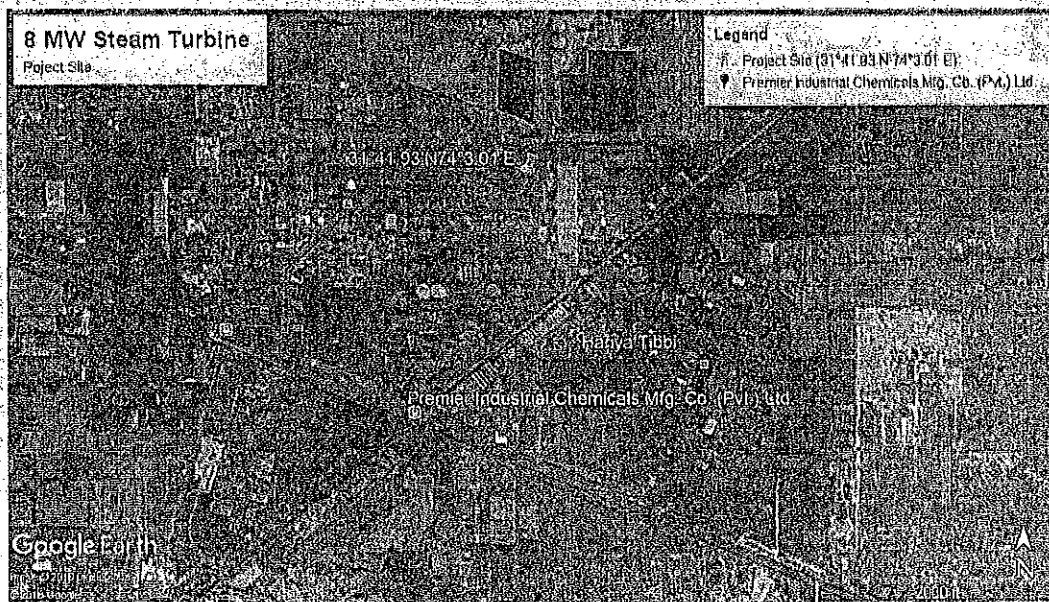


Figure 1: Location of Project Site

CHAPTER 2

DESCRIPTION OF PROJECT

2 DESCRIPTION OF THE PROJECT

2.1 TYPE AND CATEGORY OF PROJECT

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the proposed project falls in Schedule I-IEE category B(2).

2.2 PROJECT OBJECTIVES

The objectives of the proposed project are to:

- Enhance the capacity of existing power plant by additional installation of 8 MW Steam Turbine.
- Reduce the emissions of greenhouse gases (GHG) by using biomass (biogas and rice husk) for power generation.
- Increase efficiencies in terms of energy, utilities consumptions and production.
- Improve the efficiency of power generation.
- Fulfill the power demands by supplying timely and uninterrupted power supply.
- Create new employment opportunities as a part of the project activities scope opportunity.

2.3 ALTERNATIVES

2.3.1 Site Alternative

The proposed unit will be located at 9 km Lahore Road, District Sheikhpura. The site is considered suitable because of the following features:

- The proposed site falls under the jurisdiction of the proponent and has been acquired for installation of 8 MW Steam Turbine.
- The site is located inside the already existing industry. Hence, it is suitable to provide power for the industrial processes.
- Existing power plant has Environmental Approval form EPA Punjab.
- Availability of infrastructure facilities such as water supply, power, roads, social infrastructure and man power.

- No national park or wildlife habitat falls within 10 km radial distance from proposed project site.
- The site is not dangerous for public safety.
- No endangered fauna/flora has been observed near the project site.
- The proposed site does not fall in any category of protected or environmentally sensitive area.

The location of project is best suited for proposed activities. So no alternative for site is analyzed.

2.3.2 Project Alternative

Most industries purchase electricity from electric utilities or independent power producers. Premier Group is leading supplier of various products that include Chemical, Dairy and Paper. To cope up with increasing market demand and to be competitive, Premier Group intends to install a steam turbine to generate power. No project alternative is considered as the proposed project is going to fulfill the power demands through upgrading the existing power plant by supplying timely and uninterrupted power supply for the industrial processes. The proposed project is going to be installed in already established industry so no other land acquisition is required.

2.4 PROJECT DESCRIPTION

Most bio-power plants use direct-fired combustion systems. They burn biomass directly to produce high-pressure steam that drives a turbine generator to make electricity. A simple biomass electric generation system is made up of several key components. The proposed project will include:

- Steam turbine
- Generator
- Condenser
- Cooling tower
- Exhaust / emissions controls
- System controls (automated).

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

2.4.1 Turbine and its Auxiliaries

The scope of turbine unit of the 8 MW shall broadly cover the Steam Turbines along with its integral systems and auxiliaries, like lube oil system, condenser, boiler feed water pumps and drives, automatic control system, instruments and turbine protection. Specifications of steam turbine area attached as Annexure-V with IEE report.

2.4.2 Electrostatic Precipitator

Already installed boiler equipped with an ESP. The ESP will have a dust collection efficiency of not less than 99.8%.

2.4.3 Condenser

The purpose of a surface condenser is to condense the exhaust steam from a steam turbine into cycle water (steam condensate) so that it is reused in the boiler as boiler feed water.

2.4.5 Fuel Requirement

The main fuel to be used for generating power will be mixture of biogas and rice husk. However, bagasse, coal and natural gas can also be used as per requirement. Biogas will be obtained from the digester of ETP already installed at Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd. The daily fuel requirement for generation of 8 MW power shall be:

Table 2: Quantity of Fuel to be used in Power Generation

Fuel	Quantity
Biogas	180000 m ³ /day
Rice husk	as per requirement
Bagasse	as per requirement
Coal	as per requirement
Natural Gas	as per requirement

2.4.6 Water Requirement and Source

Water will be required for steam generation, condenser cooling and domestic purposes. It is estimated that 1500 m³ /day water will be required for

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

steam generation which will include 76 m³ /day as boiler make up water and 1424 m³/day as cooling tower makeup water. This water will be collected from groundwater. The project will adopt the Reverse Osmosis Process for water requirement which will be used as feed water for boiler. The capacity of existing RO plant is 90 m³/hr.

2.4.7 Resources and Utility Demand

The proposed project shall provide employment opportunities for unskilled, semi-skilled and skilled categories of employment. Employment potential shall increase with the start of construction activities. During the operation phase there will also be employment opportunities, mainly in the service sector.

2.4.8 Green Area/Landscaping

In the scope of the proposed project, areas have been designated for plantation. This will achieve a blend between modern buildings and various species of plants, shrubs to create a clean, healthy and aesthetic environment that provides a visual retreat and relaxation to the occupants of the building. A combination of evergreen trees and ornamental flowering trees and shrubs will be used.

2.4.9 Firefighting and Emergency Plan

The basic system for Fire Fighting shall be designed. Fire Hydrant pipeline will be provided in the entire building. For fire protection, provision of fire hydrants at designated places. Assembly points will be set and proper training will be provided to the workers and staff. Fire-fighting Plan layout is attached as Annexure-XI.

2.5 PROCESS DESCRIPTION

Combustion of biogas and supplementary fuel (Rice husk + Bagasse+ Coal) as per requirement produces high pressure steam in boiler. Steam produced in boiler is used to run turbine for generation of electricity. Steam from turbine after generation of electricity is condensed in surface condenser with cooling water. Steam condensate produced in surface condenser is returned to boiler for steam generation whereas cooling water is returned to cooling tower for cooling is

recirculated to surface condenser. General process flow diagram is shown in Figure-2.

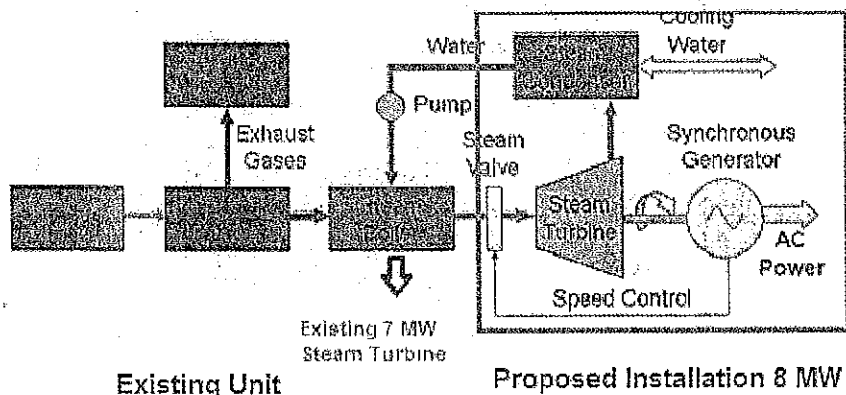


Figure 2: General Process of Power Generation

2.6 PROJECT AREA

The total area for the installation of steam turbine is 287.82 m². Project layout map is attached as Annexure-III with the IEE report.

2.7 Manpower

25-30 workers will be hired for construction phase. The staff for operational phase will be hired with respect to their skill and qualification. 6 persons per shift (3 shifts) will be required.

2.8 LOCATION AND SITE LAYOUT OF PROJECT

The proposed project site is located at 9 km Lahore Road, District Sheikhpura (Figure-3). Layout map of the project is attached as Annexure-III.

2.9 LAND USE OF SITE

The land is owned by proponent. The land use on the site will be industrial only. The site will be used for the establishment of power plant. There is no settlement, surface water body, grassland or preserved area in the proximity of the project area that could be damaged or dismantled.

2.10 ROAD ACCESS

The proposed site is accessible through main Lahore-Sheikhpura Road.

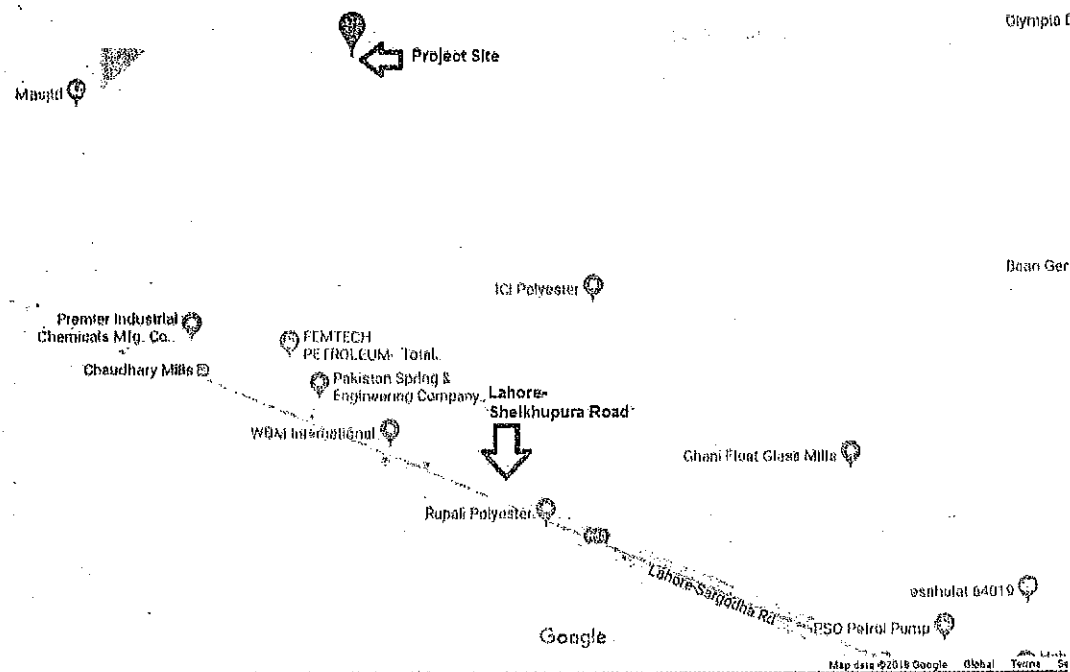


Figure 3: Road Access

2.11 VEGETATION FEATURES OF THE SITE

Proposed project site is located in already established premier industrial site. No tree cutting will be involved. The site has no vegetative cover.

2.12 COST OF PROJECT

The total cost of the project is PKR 140.6 Million. Breakdown of cost is given in Table 3.

Table 3: Breakdown of Cost

Land Cost	Own Land
Civil Work	18 (M)
Equipment/Machinery Cost	120 (M)
Landscaping/Green belt Development	1(M)
Fire Fighting Arrangements	1(M)

PPEs	0.3 (M)
Environmental Monitoring	0.2 (M)

2.13 COST AND MAGNITUDE OF OPERATION

The cost of construction for the proposed project would be 140.6 Million PKR. However, budget will be allocated for purchase and maintenance of standardized PPEs for workers, tree plantation, fire-fighting equipment maintenance and management, and environmental monitoring.

2.14 SCHEDULE OF IMPLEMENTATION

Project development will be executed as soon as the no objection certificate from the environmental protection agency, Punjab will be issued and after getting other required approvals. However, the schedule of implementation for the commencement of the civil work involved for the installation of steam turbine is approximately 2 months.

2.15 RELOCATION AND RESETTLEMENT PLAN

No human population resides within project area. No structure of any significance (cultural, religious, archaeological, recreational or any other) stands on the land selected for the project. No flora or fauna; especially belonging to endangered species is found within a safe distance from the site which is to be removed or moved to some other part. Hence, no relocation and resettlement is required.

2.16 SITE RESTORATION PLAN

The main areas to be considered for site restoration include the construction area, camp sites area, temporary tracks; land used for vehicle and material stores, material excavation pits etc. These areas should be restored to its original condition with the maximum possible effort. The restoration work comprises the removal of temporary construction works and removal of any fence installed, leveling of areas (wherever required), etc. The following procedures will be adopted for the restoration of the site:

- All temporary construction built for the site development will be removed.
- Site for construction camps should be restored to its previous conditions as much as possible.
- All the toxic and hazardous chemicals/materials will be completely removed from the site (if any).
- Any debris from construction activities should be removed properly from the site.
- All fencing and gates will be removed and pits will be backfilled.
- Whole of the site will be covered with the original soil to the original levels and grades and re-vegetation will be done, where required.

2.17 GOVERNMENT APPROVALS

Proponent has obtained NOC for disposal of wastewater and it is attached with IEE report as Annexure-XIII.

CHAPTER 3

DESCRIPTION OF ENVIRONMENT

3 DESCRIPTION OF THE ENVIRONMENT

This chapter provides baseline data (physical, biological and socio-economic parameters) related to the project and study area. The information has been compiled by using primary and secondary data resources. This chapter also refers to the theoretical analysis of the methodology adopted for collection of baseline data. The underlying principles and practices adopted in this regard are also discussed.

3.1 Methodology

The methodology employed to collect the baseline data and information regarding the social structure and various related parameters as discussed in sub-sections below:

3.1.1 Data Collection

The primary data was collected by visiting the project area and its communities in its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, and climate) was obtained by visiting relevant various government departments and their official websites. The biological parameters such as flora and fauna were studied by preparing a floristic list based on visual observation and fauna was studied by using opportunistic approach. The species were recorded with reference to their existence in the project area. Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members and government and Non-Government Organizations (NGOs). The socioeconomic aspects were studied and analyzed by studying detailed village profile and by conducting household surveys.

3.1.2 Social Survey

The purpose of social survey was to record the present condition of the people living in the project area and to assess the expected project impacts on their life,

subsistence systems and socio-cultural conditions. Prior to conducting the field surveys, the following steps were taken:

- Clear boundaries of the project area were identified
- Decided the sampling procedure in order to draw a representative sample size of the target population and households
- Developed the tools for data collection i.e. questionnaires to assess the socio-economic status of the area

3.1.3 Sampling Design

Social baseline data of the persons residing in the study area has been estimated and collected through random sampling by using pre-developed questionnaires.

3.1.4 Questionnaires

In order to test the validity and reliability of the proposed questionnaires, they were reviewed to assess whether questions needed to be clarified, changed or re-sequenced and then a final editing of questionnaires was conducted prior to their application in the project area. The sample of socio-economic questionnaires used is attached as Annexure-VI of this IEE Report.

3.1.5 Data Editing and Analysis

The filled questionnaires and recorded information were compiled by the same field investigators who were involved in the data collection. This was done immediately after completing the field investigations. Data sets were processed. Analysis of the data and preparation of conclusions in the minimum possible time was done using statistical techniques of data analysis.

o Review of Legal and Administrative Framework

The objective of reviewing legal and administrative framework is to obtain information on all legislation pertaining project development. The Socio-Environment Team of Ecogreen Company (Pvt) Ltd. reviewed the environmental policies, national, international and provincial laws and guidelines.

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

relevant to the development of project which helped in systematic identification of impacts.

o **Baseline Conditions**

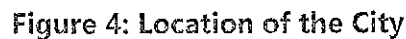
Baseline conditions refer to the existing physical, environmental and socio-economic status of the project area. On the basis of baseline information, the project interventions are assessed and mitigation measures are proposed. The baseline information also helps to indicate the specific issues to be monitored during construction and operational phases. The baseline data (physical, biological and socio-economic parameters) related to the project area is described below. Information provided is based on primary and secondary data collected by site visits, desk studies and consultation with locals respectively. This section gives the overview of the topology, geology, seismology and meteorological conditions of whole city whereas, it gives detailed information about the surface water, ground water and air quality of the project area. The detail of each parameter is discussed in sub-sections below:

3.2 Physical Resources

The physical resources consist of existing land form and land use at the project site including geology, hydrology, meteorology and climatology. The pre-project condition (i.e. baseline) of these components of the physical environment is described in detail. To identify the potential impacts on the physical, biological and socio-economic environment that is likely to arise from the project activities.

3.2.1 Geography and Geology

Sheikhupura lies 31°42'51.16"N latitude and 73°59'3.49"E longitude. The city is well connected with its surrounding big urban centers like Lahore (35 km), Faisalabad (94 km), Sargodha (143 km) and Gujranwala (54 km). Sheikhupura is also a railway junction. District Sheikhupura is spread over an area of 3,241km² and comprises 5 tehsil such as; Sheikhupura, Ferozewala, Sharaqpur Sharif, Muridke and Safdarabad.



3.2.2 Topography

~~7. 10. 1941~~

3.2.3 Climate

The District Sheikhpura has extreme climate conditions and summer season starts from April and continues till October. During the summer season, temperature ranges from 30°C to 48°C. The winter season starts from November and continues till March. December and January are the coldest months with a mean minimum temperature of about 3-5°C. The dust storms occur occasionally during the hot season, June, July and August.

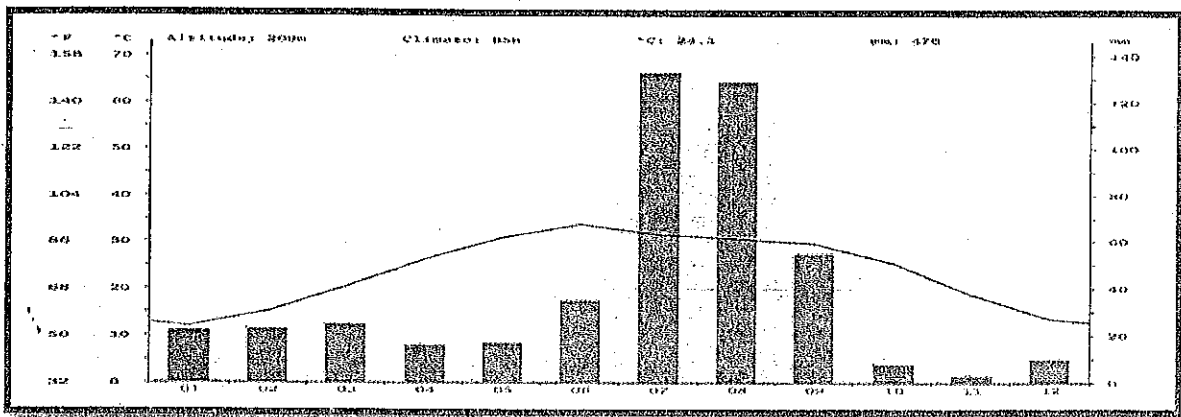


Figure 5: Annual Mean Temperature (Source: Climate-Data.org)

Rainy weather alternates with oppressive weather. The rainfall is 500 mm per annum. In the recent year, the maximum average precipitation occurred in September and it was around 50-100mm.

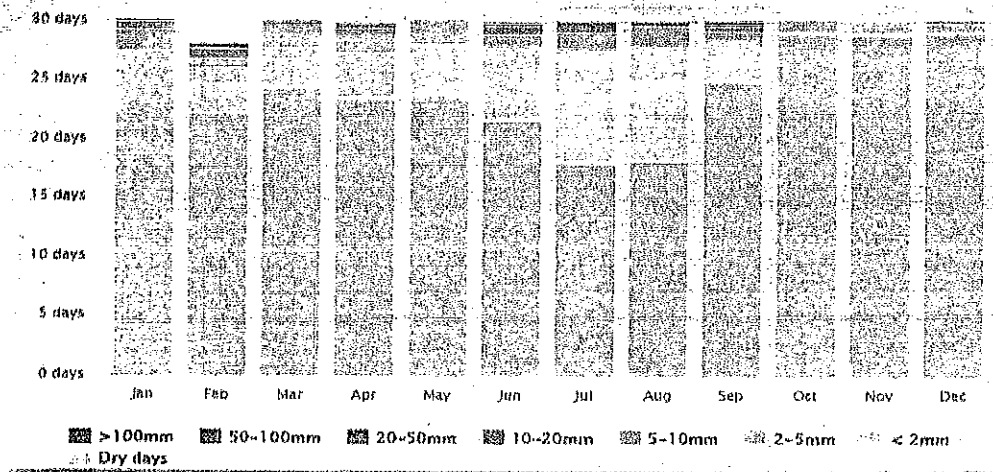


Figure 6: Average Annual Precipitation (Source : Meteoblue)

The average daily wind speed was highest in July which was 38 km/h. In recent years, the maximum sustained wind speed has reached 38 km/h.¹ The diagram shows how many days within one month can be expected to reach certain wind speeds. Monsoons create steady strong winds on the Tibetan Plateau from December to April, but calm winds from June to October.

The wind speed directly affects the dispersion and transport of plume. So, the greater is the wind speed, the greater will be the dispersion and the distance at which plume strikes the ground and the lesser will be the pollution concentration.

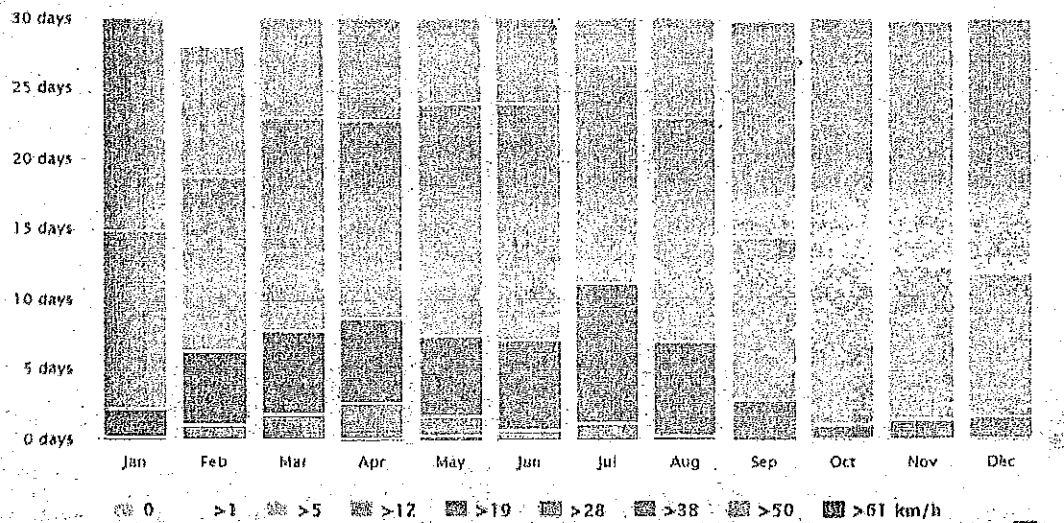


Figure 7: Average Wind Speed (Source: Meteoblue)

3.2.4 Seismicity

According to Seismic Zoning of Pakistan, the project area lies in Zone 2A and represents minor to moderate damage due to earthquakes.

¹<http://www.myweather2.com/City-Town/Pakistan/Shekhupura.aspx>

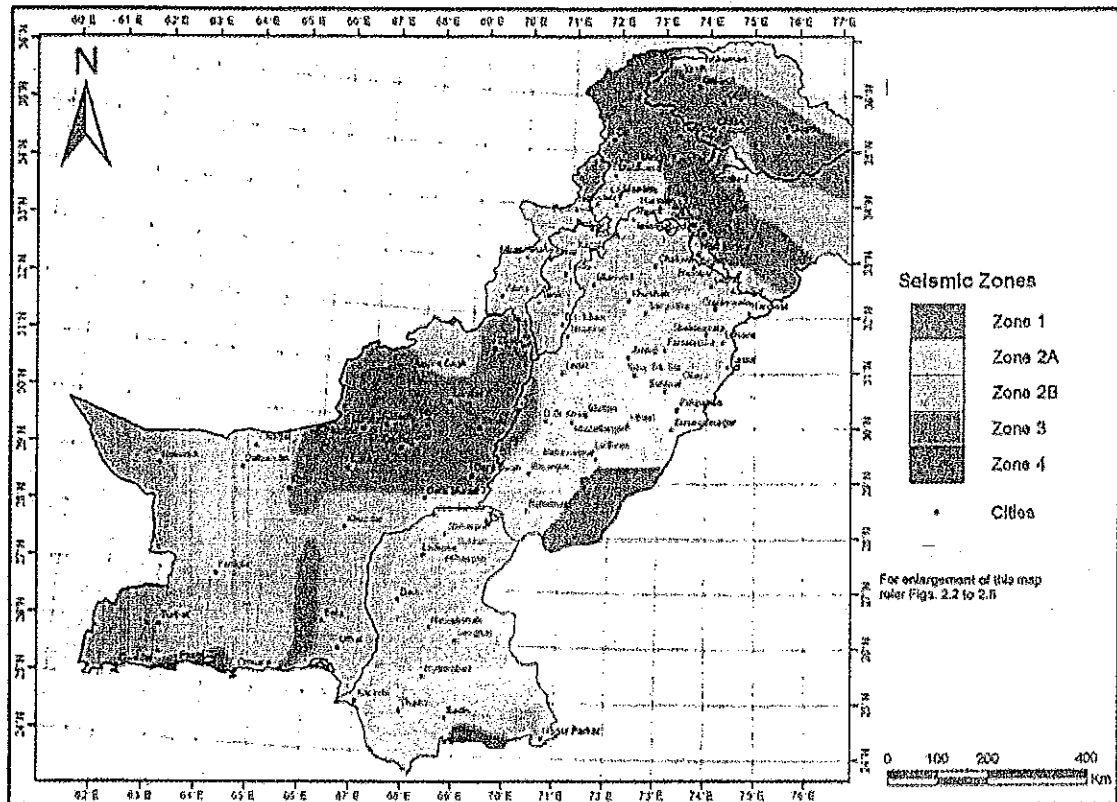


Figure 8: Seismic Zones of Pakistan

3.3 Ecological Environment

District Sheikhupura is not rich with biological and ecological resources. However, the flora and fauna of the District includes; shrubs, herbs, mammals, birds, reptiles, amphibians and insects are found. They are discussed in detail below:

3.3.1 Aquatic Flora and Fauna

No aquatic ecosystem (i.e. canal, stream, river or pond) observed within or around the study area, which omits the possibility of any kind of aquatic species that may be harmed due to the establishment of proposed project.

3.3.2 Flora

The project is located in industrial area. The project site has no vegetative cover, hence, no trees or vegetation will be removed.. The dominant tree species in study area include; Eucalyptus, Neem, and Kikar. The nomenclature including

common, English, local and botanical names of the flora found in the study area are presented in Table 4:

Table 4: Inventory of the Trees Present in Sheikhpura District

S#	Common Name	Scientific Name
1	Neem	<i>Azadirachta indica</i>
2	Kikar	<i>Vachellia nilotica</i>
3	Safeda	<i>Eucalyptus globulus</i>

3.3.3 Fauna

For study of fauna in the project area, field guides and books were consulted. On the other hand field observations were conducted along with the interviews of local community members about the fauna of the area. The equipment used in field included cameras, binoculars and GPS device (wherever required). It is important to note that there is a number of factors which can change the findings of such survey. It may be pointed out that the pattern of seasonal migration of small birds varies depending upon each specie. During the construction activity in project area, no important biological feature will be damaged or disturbed as the project falls in industrial area.

The fauna commonly found in District Sheikhpura includes; Hares, Falcon, Eagle, Quail, Starling, Jungle Pigeon, Russian Sparrow, Doves, King Fisher, Parrot, Crow and Local Sparrow.

Commonly found mammals in the area include; dogs, cats, horses, house-rats, squirrels, porcupines and bats. However, Small Indian Mongoose and Indian Palm Squirrel are also found in the District Sheikhpura.

Table 5: Mammals in the Study Area

S#	Common Name	Scientific Name
1	Rat	<i>Rattus</i>
2	Bat	<i>Chiroptera</i>
3	Small Indian Mongoose	<i>Herpestes javanicus</i>
4	Indian Palm Squirrel	<i>Funambulus palmarum</i>
5	Porcupines	<i>Erethizon dorsatum</i>
6	Squirrels	<i>Sciuridae</i>

The commonly found birds species include; House Sparrow, Crow and some of them are mentioned below with scientific names:

Table 6: Birds in the Study Area

S#	Common Name	Scientific Name
1	House Sparrow	<i>Passer domesticus</i>
2	House Crow	<i>Corvus splendens</i>
3	Pigeon	<i>Columbidae</i>
4	Bulbul	<i>Pycno notidae</i>
5	Teetar	<i>Francolinus francolinus</i>
6	Parrot	<i>Psittaci forms</i>
7	Titodi	<i>Vanellus indicus</i>

In District Sheikhpura reptiles such as Snakes (Cobra and Kraits), Spiny Tailed Lizard and Fringed Toed Lizard are common in the tract, but cases of snake bites are very rare, as these reptiles have been either killed by expanding urbanization or they have moved away.

Table 7: Reptiles in the Study Area

S#	Common Name	Scientific Name
1	Snake	<i>Serpentes</i>
2	Spiny Tailed Lizard	<i>Uromastix hardwickii</i>
3	Fingered Toed Lizard	<i>Acanthodactylus cantoris</i>
4	Earthworm	<i>Lumbricina</i>

The amphibians commonly seen around the project area, especially during the rainy season includes;

Table 8: Amphibians in the Study Area

S#	Common Name	Scientific Name
1	Common Frog	<i>Rana temporaria</i>
2	Indus Valley Toad	<i>Bufo stomaticus</i>

A large number of insects are present due to open fields in the project site. Few of these insects are known to cause diseases in local population. Following is a list of commonly observed insects at the site:

Table 9: Insects in Study Area

S#	Common Name	Scientific Name
1	Black Ants	<i>Paratracheaioignicornis</i>
2	Dragon Fly	<i>Dragon Fly</i>
3	House Flies	<i>Musca domestica</i>
4	Butter Flies	<i>Parnassiusbalucha</i>
5	Honey Bees	<i>Apis mellifera</i>

6	Wasps	<i>Anagyrus pseudococci</i>
7	Grasshopper	<i>Melanoplus differentialis</i>
8	Mosquito	<i>Anopheles sp.</i>

No endangered species are found at the site. The area has not been identified as ecologically sensitive area by wildlife department.

3.4 Environmental Monitoring

Laboratory analysis for environmental monitoring of proposed site is done in order to check the baseline conditions and pollution load. In this connection M/S Global Environmental Laboratory (GEL) who is EPA certified laboratory, was engaged to carry out environmental monitoring of wind speed, air quality, drinking water quality, noise level and particulate matter concentration in the project area.

Ecogreen has facilitated GEL to collect the ambient air samples from project site located at 9 km Lahore Road, District Sheikhpura. The project will be constructed within existing industry building.

Detail laboratory report of ambient air quality, ambient noise and surface water analysis results is annexed at Annex-VIII of this IEE Report and the detail information related to the testing is given below:

3.4.1 Sampling Sites

Samples of water, noise and air for testing according to the testing guidelines of Punjab-EPA. It also defines number of samples as well as the number of sites from where samples were collected.

Table 10: Sampling Sites Details

Sr#	Particulars	Details
1	Number of Samples	Three (03)
2	Kind of Monitoring	Ambient Noise, Ambient Air and Ground Water
3	Sampling Sites	One (01)

3.4.2 Ambient Air Quality

The primary source of air pollution at the project sites is the vehicular emissions, industries and the key pollutants likely to be found at project proposed locations are Carbon Monoxide (CO), Oxides of Nitrogen (NO_x), Sulphur Dioxide (SO_x), and Particulate Matter (PM). In order to determine the air quality of the area, Laboratory had the requisite air sampling device and expertise for collection of samples. Ambient air quality of the project area was monitored within the project area.

3.5.4 Noise

Noise level of the project area was monitored at project site using digital sound meter

3.4.3 Water Resource

The main source of the water consumption is the ground water which is being pumped from 550 ft and its being used in the study area for domestic purposes. To check the quality of the water in the area, ground water was collected and analyzed. The ground water was collected from bore hole adjacent to the project area.

3.5 Socio-Economic Resources

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different types of socio-economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community.

3.5.1 Socio-Economic Profile of Study Area

This topic provides an overview of the baseline information relating to the socio-economic environment of the project area and the AOI. The socio-economic

study gives information about the demographic profile, occupation, education and health facilities in the project area.

3.5.1.1 Nearby Residential Areas

The proposed project site is located inside already existing building of Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd. The project site is located inside industrial zone. However, nearby residential areas from the project site are shown in Figure-9.

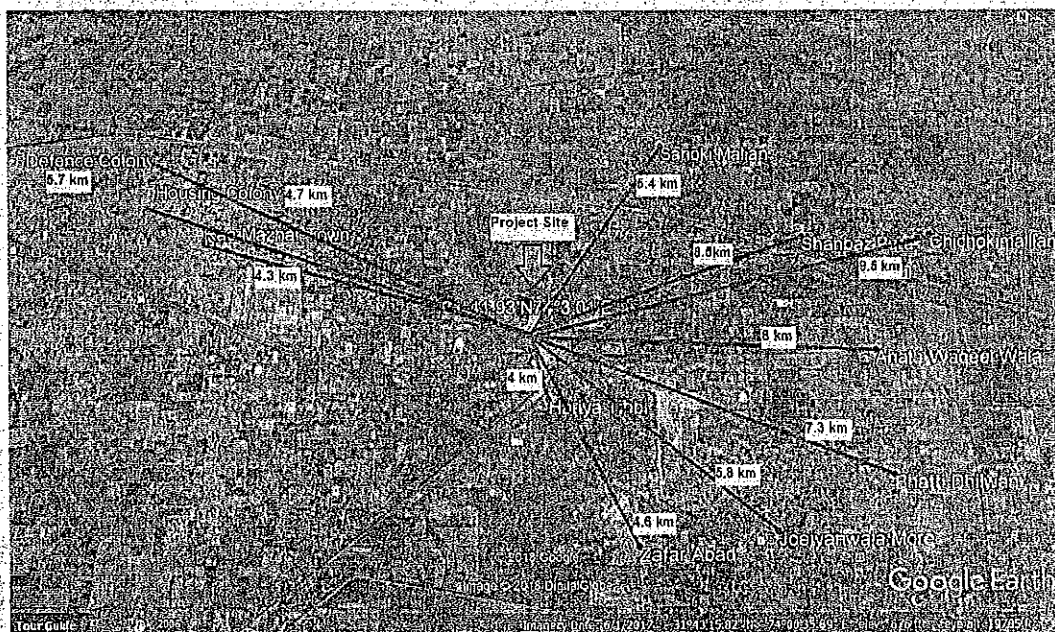


Figure 9: Nearby Residential Areas

The project site is 4 km away from residential community and its connected to the other parts of the country through N60 and the local road network. During the survey of project area, socioenvironmental team of Ecogreen Company (Pvt) Ltd. visited near by residential area which is in the closest to the project site.

The Hariya Tibbi Village is at approximately 4 km distance away from the project site. The total population, of village is approximately 4520 having ratio of 44% males and 56% females.

3.5.1.2 Village Profile

The village profile reflects the basic socio-economic conditions of local people. These parameters indicate the needs of society while planning the the aforesaid project. The village profile has been obtained by meeting with community representatives who are well aware about their surroundings. The consultant, with his team, visited project area and study area in order to identify the socio-economic and environmental aspects of project. The following information about the Hariya Tibbi Village is obtained by surveying the community.

Table 11: Study Area (Village Profile)

S#	Socio-Economic Indicators	Village Hariya Tibbi
1	Language Spoken	Punjabi
2	Distance from Project Area	4 km
3	Accessibility of Road	Metaled Road
4	Transport	Public and Private Transport
6	Population	4520
7	Livelihood	Agricultural, Livestock and Labor
8	Houses	645
9	Educational Facilities	Primary School, Secondary School and Govt. & Private College
10	Institutional Facilities	Mosque
11	Civil Facilities Available	Electricity, Water Supply and Graveyard
12	Source of Water	Groundwater
13	Common Diseases	Fever, Hepatitis, Common Cold, TB, Typhoid, Diarrhea and Malaria
14	NGO Working in Study Area	NGO (NRSP)
15	Historical Place	NIL
16	Grain and Livestock Markets	NIL
17	Cottage Industry	NIL
18	Types of Trees	Neem, Kikkar and Eucalyptus
19	Disaster Management	NIL
20	Major problems of the Study Area	Safe Drinking Water, Sanitation and Sewerage System, Roads Access, Educational and Medical Problems

3.5.1.3 Social and Public Amenities Available

The social and public amenities present in the area are given below:

a. Physical structures

There is no population living in the project area but the study area is semi populated. The land use on the project site is industrial. The people in this area are deprived of basic facilities like health, proper sewerage and sanitation facility, medical facilities, provision of safe drinking water, etc.

b. Religious Structure

There a mosque located at 0.9km from the project area. There is no shrine, structure or any other religious infrastructure present in the proposed project site that could be damaged and dislocated due to the proposed project establishment.

c. Protected Structures

There is no protected site, structure or any other social infrastructure present in the proposed project site.

d. Cultural Heritage and Community Structure

Ecogreen team also visited the study area but did not find any cultural heritage and community structure within the study area that could be impacted due to the proposed project.

3.6 Quality of Life Values

Socio-Economic Questionnaire and Environmental Checklist were used as survey tools by the Ecogreen survey team to collect desired information. Graphical representation of results of Socio-Economic Survey is given below:

3.6.1 Occupation of Respondents

Majority of the respondents (20%) belongs to the labor class, 33% have their own business, 13% daily wagers, 13% attached with agriculture, 7% shopkeepers and remaining 7% are private employees. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

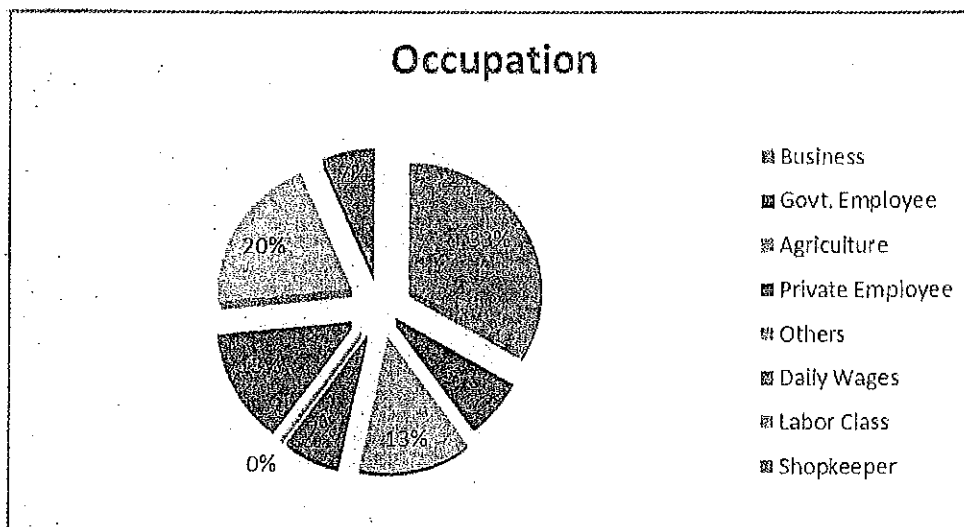


Figure 10: Occupation of Respondents

3.6.2 Personal Income

Based on the sample survey results, as the figure shows that nobody was earning less than 20,000 rupees, 69% of respondents fall within the income range of 20,000 - 25,000, 23% respondents earn 30,001 - 40,000 while only 8% of the respondents earn within the range of 40,001 - 45,000.

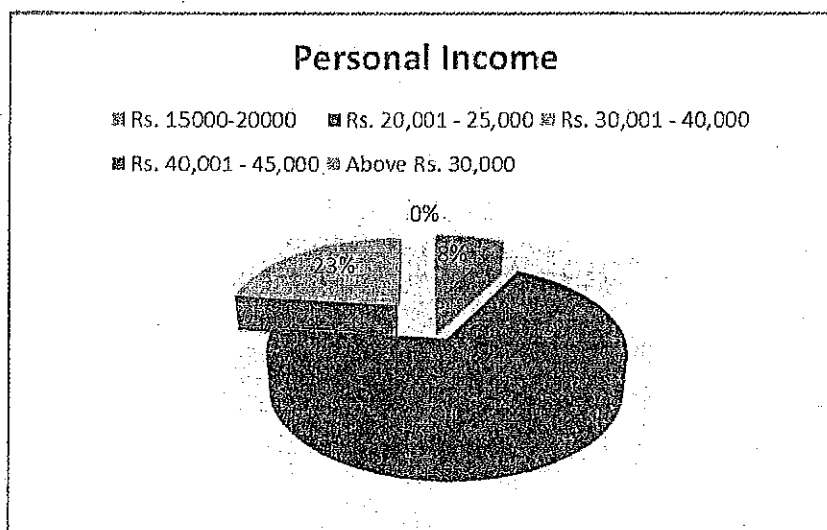


Figure 11: Personal Income

3.6.3 Literacy Rate

From survey results, it was found that 14% of the studied population was illiterate, 36% was up to primary level, 43% studied up to middle level and only 7% of the respondents studied up to higher secondary level.

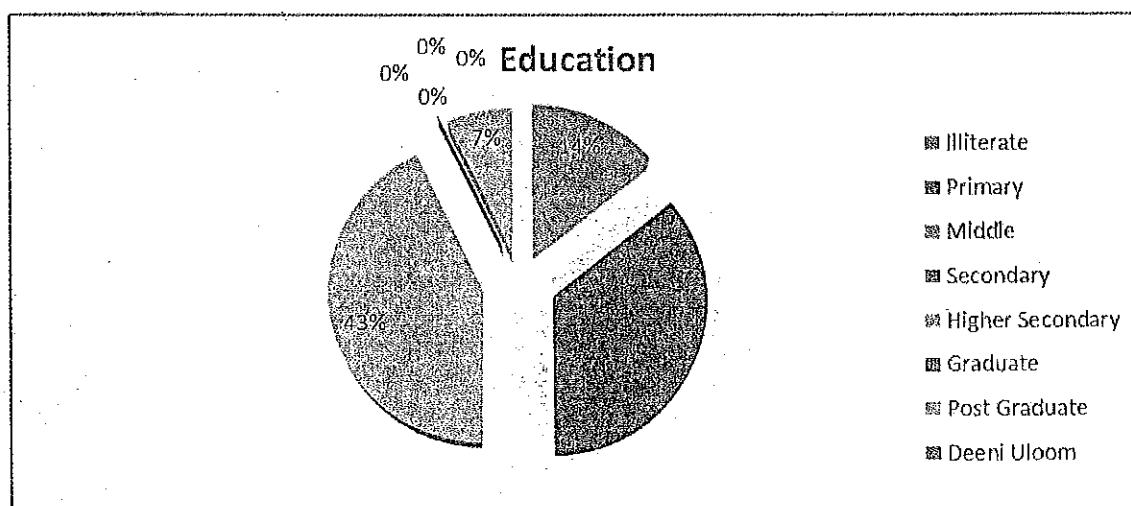


Figure 12: Literacy Rate

3.6.4 Common Diseases

According to the survey the common diseases recorded in the project area were, Diabetes, Fever, Hepatitis, Hypertension, stomach problems, Malaria, Typhoid, Nephritis and Diarrhea².

3.6.5 Cultivated Crops

The main crops that are being cultivated in the study area include; Rice, Wheat, Sugarcane, Onion, Tomato and Potatoes as well as fodder crops. The area is famous for best Basmati rice production in the world.

3.6.6 Livestock

People in the study area have common livestock which include; Cows, Buffalos, Sheep, Goats and Hens. However, there is no proper cattle or poultry farm observed within the study area.

3.6.7 Educational Institutes

There is one primary school, secondary school and Government & Private

²Source: Climate Change Working Papers No. 9, 2015.

Colleges present in the study area.

3.6.8 Nearby Industries

Following industries are present in the vicinity of the proposed project site.

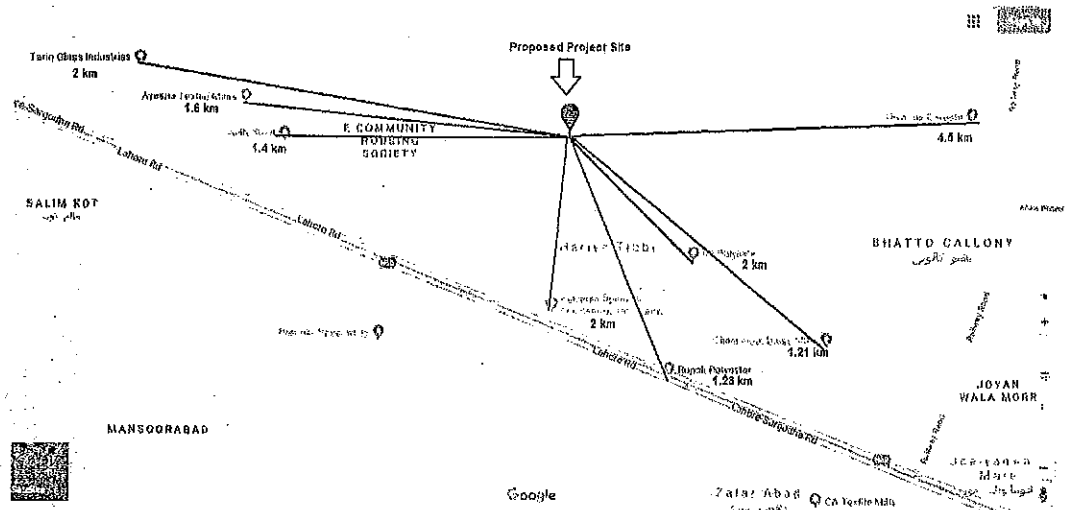


Figure 13: Nearby Industries

3.6.9 Facilities Available

Facilities available at the houses, shops and factories are depicted here. It shows that electricity, water supply, telecommunication, sewerage, gas supply and every other routine facility is available in study area.

3.7 Project Response

Respondents were inquired about their views regarding the proposed project. Out of total respondents 70% of the respondents knew about the project whereas, rest of the respondents doesn't have prior knowledge of the project planning and commencement. Almost 85% respondents of were in favor of the establishment of proposed project in their vicinity as this will increase the employment opportunities and raise the overall socio-economic status of the area.

Table 12: Concerns and Solutions

Main Theme	Concerns	Solutions
Employment	The hiring during construction and operational phase, local should be considered realistically	The proponent will try to engage local people on priority basis
Environmental Impact	Air pollution, improper handling of wastewater and mitigation of noise impacts	<ul style="list-style-type: none"> • Based on the result of ambient air and noise sampling, necessary mitigation measures will be adopted • To mitigate the impact of the contamination from the generation of wastewater, waste will be handled properly • To control the air pollution electrostatic precipitators will be installed • Tree plantation will be carried out in the designated green space

Social Impact	Public nuisances issues may arise due to the spread of diseases in the case of improper disposal of the solid waste and the air emission may cause issues	<ul style="list-style-type: none">• Proper handling of the waste such as segregation and composting of the solid waste will be carried out to reduce the public nuisance and to improve the public health• To control the air pollution electrostatic precipitator is already installed• A registered will be maintained to registered the complaints of the local community
----------------------	---	--

3.8 Lab Reports of Environmental Analysis

Testing of different parameters was done from a certified laboratory to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis and noise) is attached at Annex-VIII of this IEE Report.

CHAPTER 4
POTENTIAL
ENVIRONMENTAL IMPACTS
AND MITIGATION
MEASURES

4 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The potential impacts from the project area are identified and assessed based on the type and scale of the various activities associated with this project. Several aspects and potential impacts were identified for each phase (Project Location, Construction and Operation) of the development, with impacts evaluated in terms of their nature, occurrence, possibility and severity potential.

4.2 OBJECTIVES

The objective of screening is identification of the adverse as well as beneficial impacts and then mitigating the effect of adverse impacts up to acceptable limits or within PEQS. Following are the objectives of screening out all significant environmental and social impacts:

- To find different alternatives and ways of carrying out the project activities which may cause adverse impacts
- To enhance the Environmental and Social benefits of project
- To avoid, minimize and remediate adverse impacts
- To ensure that residual adverse impacts are kept within acceptable limits

In the sub-sections below the impacts assessment methodology for the installation of 8 MW Steam Turbine located inside Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd. has been defined. It includes the magnitude, the extent of the impact and the nature of the anticipated impact.

4.3 METHODOLOGY

This section discusses the project's potential environmental impact on the area's geomorphology, soil, water resources, air resource, biological resources and socioeconomic condition and, where applicable, identifies mitigation

Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.

measures that will reduce, if not eliminate, its adverse impact. The assessment carried out in the sub-sections below is based on potential impacts on overall environmental receptors within the project area. Impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

4.3.1 Magnitude

The magnitude of the impacts associated with the proposed project include the type of impact project commencement will cause to its immediate environment and social structure. It could be direct, indirect and cumulative.

4.3.2 Immediacy

Immediacy of the impact focus on the following parameters:

- Temporal Extent (during construction and operation)
- Spatial Extent (local or widespread)

4.3.3 Sustainability and Reversibility

Sustainability and reversibility of the impact focused on the following parameters:

- Mitigability (Fully/Partially)
- Monitoring (Fully/Partially)

4.3.4 Purpose of Mitigation Measure

The basic purpose of mitigation measures is to reduce the impacts of the establishment of a commercial building on the socio-environment up to the maximum possible extent. The mitigation measures are suggested based on the following parameters:

4.3.5 What is the problem?

The proposed project is the installation of 8 MW Steam Turbine. The study area is leveled and industrial zone. In addition, to the noise and fugitive dust emissions during the development phase solid waste also requires proper management. The major impact associated with the operation of turbine includes air emissions, boiler blowdown and ash.

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

The impacts from the installation of steam turbine will occur during the construction and operation due to the civil work involved and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

4.3.7 Where problem should be addressed?

The problem will be generated from site development and operation of the steam turbine. So, it should be addressed on source i.e. at site within the same timeframe.

4.3.8 How the problem should be addressed?

Proper mitigations measures will be provided according to the nature of the impacts/problems.

4.4 Ways of Achieving Mitigation Measures?

Following ways will be adopted to reduce the impacts of the proposed development:

4.4.1 Changing in Planning Design

Proposed design is developed considering environmental risk and hazards. Moreover, there is no endangered and threatened species present in the project area. Any human settlement or infra-structure will not be dislocated or dismantled due to the proposed project development. Hence, there is no need to change the design of project.

4.4.2 Improved Management and Monitoring Practices

The anticipated impacts had been reduced significantly by adopting better management activities, as it will be carried out for betterment of the society. While environmental monitoring will be conducted on the regular basis to keep the sources of the air pollution, wastewater generation, noise and public

nuisances in-check. Following practices that need to be adopted to reduce the impact significantly:

a. Compensation in Money Terms

Due to the installation of proposed project, no tree cutting will be involved, however, there is no protected or environmentally sensitive area present within 10.0 km vicinity of the project that could be impacted. Hence, no compensation in the monetary terms will be required.

b. Replacement/Relocation/Rehabilitation

The proposed project site is owned by the proponent and reserved for the establishment of aforesaid building. No replacement, relocation and rehabilitation will required for the commencement of the aforesaid project.

4.5 Impact Significance

Evaluation of impacts signifies the potential impacts in terms of its likelihood nature as per the following criteria:

- The impacts are further classified based on their spatial distribution, i.e. *local*, when impacting an area of approximately 1 km radius from the project area, *moderate spread*, when impacting an area of 1 to 2 km radius and *regional* beyond 2 km.
- The impacts are classified as *short term*, *moderate term* and *long term* in terms of their existence in temporal scale. Impacts less than 1 year existence as *short term*, while those with 1 to 3 years as *moderate term* and more than 3 years as *long term*.
- The negative impacts are termed as *adverse impacts* while positive impacts as *beneficial*.

The significance of environmental impacts of various involved activities has been evaluated based on the criteria outlined in Table 16.

Table 13: Impact Significance Criteria

Impact Significance	Criteria
Very High	When the impact is of high intensity with high spread and high duration
High	When the impact is of moderate intensity with high-moderate spread and high-moderate duration
Medium	When the impact is of low intensity but with moderate spread and moderate duration or of moderate intensity
Insignificant	When the impact is of low intensity, low spread and low duration
Beneficial	When the impacts are positive

Based on the above-specified criteria, Matrix method has been used to describe potential environmental impacts due to proposed project as shown in Table 14 and 15. It is important to note that one activity may have varying impacts on different receptors i.e. different components of the environment. To avoid repetitions, this section describes various activities, which may have wide impacts on many receptors.

For example, waste generation and disposal will have impacts on land, water bodies, odour nuisance etc, therefore, the impacts of waste generation and disposal have been considered as one of the key areas of impacts. Similarly, gaseous emissions may be adverse to air quality; which on exposure may impact upon health of individuals and ecology in the surroundings.

Table 14: Impact Screening Checklist (Construction Phase)

Environmental Sensitivities	Nature of Likely Impacts						Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality		✓		✓							
Noise	✓			✓							
Water Quality		✓			✓						
Land Environment			✓		✓						
Flora		✓		✓							
Fauna	✓			✓							
Local Economy			✓		✓						
Social Impacts			✓	✓							
Health & Safety		✓		✓							

Table 15: Impact Screening Checklist (Operational Phase)

Environmental Sensitivities	Nature of Likely Impacts						Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality	✓			✓							
Noise		✓		✓							
Water Quality		✓		✓							
Land Environment	✓										
Flora	✓			✓							
Fauna	✓			✓							
Local Economy			✓		✓						
Social Impacts			✓	✓							
Health & Safety		✓		✓							

Table 16: Impact Assessment (Construction Phase)

ENVIRONMENTAL STANDARDS					ECOLOGICAL IMPROVANCE			SOCIAL IMPROVANCE			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-1	-1	-1	-1	0	-1	0	0	0	0	+1	+1

Table 17: Impact Assessment (Operational Phase)

ENVIRONMENTAL STANDARDS					ECOLOGICAL IMPROVEMENT			SOCIAL IMPROVEMENT			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-2	-2	-2	1	0	-1	0	0	0	0	+2	+1

Key: 1 = Minor Impacts are defined as Less significant adverse impacts that may be easily prevented or mitigated

2 = Moderate Impacts are considered as likely to have adverse environmental impacts

3 = Major Impacts are defined as significant, or irreversible adverse impact

0 = This category serves no impacts from project

4.6 IMPACTS DUE TO PROJECT LOCATION

The development will have both socio-economic and environmental implications as discussed in the sub-sections below.

4.6.1 Relocation of People

Currently, there are no infringements on the project site that may be affected therefore relocation exercises are not required.

4.6.2 Loss of Vegetation

Considering the scale of the project and commonly found flora and fauna within the project influence area, no significant adverse effects are envisaged on the ecology of the area. As the project site falls in industrial area and already established site, no tree cutting will be involved. The site has no vegetative cover.

4.6.3 Shifting of Utilities

There will not be any shifting of existing utilities such as water supply pipelines, sewers, electrical lines, etc. due to the proposed project.

4.6.4 Impact on Archaeological/Cultural Property

Within the project influence area there are no significant archaeological properties, hence no impact in this area is anticipated.

4.7 IMPACTS DUE TO PROJECT DESIGN

Design of the proposed project can have impacts on the environment if it is not prepared accordingly. It is necessary to consider a sustainable project approach. Sustainability is an important issue to consider in design, not only due to environmental concerns but also due to economic and social matters, promoting architectural quality and economic advantages.

Mitigation Measures

- The design process should be carried out in recognition of identified hazards and risks assessment. Accepted design solutions should focus on maximum possible opportunity for risks reduction.
- Carry out engineering surveys including environmental surveys depending on the level of complexity and potential hazards of the planned facilities in the area of construction.

- The proponent intends to construct the building on modern lines, meeting national standards, with incorporation of latest technology. The design, if maintained and operated in sustainable manner, is expected to cast positive impact on the environment.
- Integrate within the existing environmental infrastructure at site to facilitate sharing of services and amenities (e.g. power, water, solid refuse collection and roads), safety arrangements and waste management systems among others. This has already been catered as per the designs annexed.
- Minimize risks to health and impacts to external environment. Suitable anti-pollution facilities (solid waste containment and organized removals, waste water purification) should be part of the design.

4.8 IMPACTS DUE TO PROJECT CONSTRUCTION

Project constructions typically change the natural environment, creating negative impacts in some cases. These are short-term impacts of low magnitude, which are easily managed.

4.8.1 Contamination of Soil and Water Quality Degradation

If not properly disposed of, the spillage of oil from the machinery, cement residue from concrete mixer plants, sewage and solid wastes, might contaminate the soil. No impact is expected on potable water, since this will be directly supplied. Surface or ground water however, may be impacted as follows:

- Chemical contamination from construction materials such as cement, paint and mechanical fluids
- Increased siltation caused by surface runoff (as a result of the removal of vegetation and the placement of raw materials e.g. sand)

Mitigation measures

- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on site should be covered with tarpaulin or similar fabric during rainy season.
- Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

- All machinery and equipment be regularly maintained and serviced to avoid leak oils.
- Maintenance and servicing of vehicle, machinery and equipment must be carried out in a designated area and where oils are completely restrained from reaching the ground. Such areas should be covered to avoid storm water from carrying away oils into the soil or water systems. Waste water/wash water from these areas should be properly disposed.
- Areas dedicated for hazardous material storage shall provide spill containment and facilitate clean up through measures such as dedicated spill response equipment.

4.8.2 Impact on Air Quality

Potential impact on the air quality during the construction stage will be due to the fugitive dust and the exhaust gases generated in and around the construction site. Although gaseous air pollution was not detected, the baseline reveal that on windy days, nuisance level fugitive dusting occurs. Dust is a major component of air pollution, generated mainly from the following construction activities:

- Site clearance and use of heavy vehicles and machinery/equipment etc. at construction site
- Procurement and transport of construction materials, such as sand and cement to the construction site
- Excavated materials (soil) stockpiled

Mitigation measures

- Construction equipment will be maintained in good operating condition to reduce exhaust emissions.
- Construction site, transportation routes, diversions and materials handling sites to be water-sprayed on dry and windy days.
- Haulage trucks must be covered or the aggregates sprayed with water before loading the haulage trucks
- All diesel fuel in use should be ultra-low sulphur diesel.



- The project area will be cordoned off to minimize dust migration to nearby facilities by wind.
- Speed controls by temporary speed bumps on diversions where necessary within the construction site
- Staff working in dust generating activities e.g. site preparation, excavation, concrete mixing, stone dressing should be provided with personal protective equipment (PPE) the use of PPE shall be enforced.
- Avoiding open burning of solid wastes.

4.8.3 Soil Erosion

Ground surface alterations during the project site preparation and the transportation of construction materials and equipment, using heavy trucks will disturb the soil surface, making it highly susceptible to soil erosion occurrence. The disturbed soil could easily be transported by surface runoff, causing clogging of nearby drains and sewer pipes. This is likely to be temporary impacts, ceasing after the project construction stage is completed. It is anticipated that the proposed project will not have a significant soil erosion impact if preventive measures are undertaken during the project design and construction stages.

Mitigation Measures

- The soil erosion problem will be addressed during the project design and construction stages when the necessary control measures would be considered and incorporated in the project design and implementation.
- The soil on site will be investigated prior to site preparation for building construction and appropriate safety procedures developed to reduce the occurrence of increased soil erosion.
- Measures taken to control erosion will include clearing and grading the ground surface within approved work limits, stripping the top soil layer from the subsoil, stockpiling the removed soil in approved areas to be retrieved during landscaping and site restoration.
- Replanting the original vegetation after construction is completed.

4.8.4 Noise Pollution

Noise is perceived as one of the most undesirable consequences of construction activity. Though the level of discomfort caused by noise is subjective, the most commonly reported impacts of increased noise levels are interference in oral communication, and disturbance in sleep. Noise levels in the vicinity of the site were found to be above normal limits for residential areas. Due to the various construction activities, there will be short-term noise impacts in the immediate vicinity of the project corridor, which may exceed acceptable limits and reach nuisance levels for residents. These include:

- Concreting and mixing
- Excavation for foundations with driller (if used)
- Construction plant and heavy vehicle movement (e.g. cranes)

Since the project site is surrounded by open areas, no major adverse impacts are envisaged in the project area. Also, the noise levels are not expected to exceed occupational limits; therefore no adverse effects on employees should result.

Mitigation Measures

- Reduce equipment noise at source by proper design, maintenance and repair of Construction machinery and equipment
- Use noise-abating devices wherever needed and practicable.
- The movement of vehicle should be restricted during night time.
- Providing workers with noise related PPE's
- Planting of trees that could serve as sound buffers.
- Noise barriers must be put in on and around the project boundary
- Hauling trucks shall be operated at low speed to minimize vibration, promote road safety, etc.

4.8.5 Traffic Congestion

The proposed site is near main Lahore-Sheikhupura Road and as such will see traffic volumes highest in the morning when residents are on their way to work, and in the evenings on their return. There is expected be a short-term negative impact on traffic, especially if construction materials are being delivered

during peak times. The transportation of construction material from source to site will entail the use of slow moving heavy trucks, which have the potential to contribute to traffic build-up.

Mitigation Measures

- Construction activities that might substantially disrupt traffic e.g. delivery of materials should not be performed during peak travel periods to the maximum extent practicable.
- Warning signs should be used as appropriate to provide notice of road hazards and other pertinent information to motorists and the general public.
- Signage and barricades should be used as part of the typical construction traffic controls.
- Temporary manual traffic control should be used when construction occurs at the site entrance.

4.8.6 Solid Waste

Construction activities will lead to the generation of solid waste in significant amounts, mainly in the form of construction debris. Solid waste will be generated at the site during site preparation and construction phases. The waste may consist of excavated materials, paper/cement bags, empty paint and solvent containers, broken glass among others.

Unfit disposal of construction waste or spoil could have medium environmental and public health impact. Extent of this impact will be local as waste will be dumped on site and no immediate neighborhoods exist around project site.

Mitigation Measures

- Waste, including excavated soil and debris should be properly disposed of by backfilling and landscaping.
- Construction waste should be recycled or reused to ensure that materials that would otherwise be disposed of as waste are diverted for productive uses. In this regard, the proponent/contractor should be committed to ensure construction materials left over at the end of construction

will be used in other projects rather than being disposed of. Some of the waste can be sold or recycled/reused by construction companies.

- Contracted waste handlers should be licensed to transport and dispose waste at approved dumpsites only.
- During transportation of waste, it should be covered to avert dispersion along the way.
- Hazardous waste will not be mixed with other solid waste generated and should be managed by way of land-filling.

4.8.7 Ecological Impact

The proposed project site has a very limited value as wildlife habitat because of lack of vegetation cover. The area around the proposed site has been developed for some time and is frequently disturbed by human activity. There are no threatened or endangered biodiversity (flora and fauna) species and protected areas known to exist within the proposed project site. For these reasons it is expected that any activities for vegetation removal, ground excavations and leveling are likely to cause minimal or no biodiversity impacts in the proposed project site.

Mitigation Measures

- Measures taken to control loss of biodiversity will include:
- Strict instructions will be given to all personnel working in project area to refrain from killing, capturing or disturbing any species of bird, reptile or mammal encountered during project activities, except in self-defense.
- No removal of vegetation will be done at the project site.
- Appropriate mitigation measures will be introduced to minimize contamination of soil and ground water.
- Replanting the original vegetation after construction is completed.
- The soil removed from the building site will be used in landscaping around the paved areas for enhancement of environmental quality.
- The surrounding areas will be replanted with grass and flowers, and other

suitable plants, and the administration staff will be asked to monitor the recovery of the planted natural vegetation.

4.8.8 Social Impacts

Positive Social Impact:

There will be a long-term, positive impact on the social landscape of the project area. Social impacts could result from an influx of migrant workers and associated induced development. This will ensure a rise in the consumption of consumer goods in the local area, which will further affect the wider economy. As far as possible, local labour within the project influence area will be utilized for construction purposes.

Negative Social Impact:

➤ Safety and Health Risks

- The generation of solid waste, sewage, fugitive dust and gaseous emissions can impact on public health and safety, if not properly managed.
- Construction activities have potential to pose occupational risks, some of which could be life-threatening, for example, fatal falls if workers do not use safety harness when working at heights. In addition, falling debris could injure workers if personal protective equipment (PPE) are not provided or properly used. Back injury could occur if workers lift heavy objects using inappropriate body posture. Other potential hazards might be; driving equipment with improper brake system, lack of concentration while working and exposure to hazardous wastes such as paints, cement, adhesives and cleaning solvents. This impact is expected to be short term.

Mitigation Measures

- Regular drills shall constantly follow on various possible incidences. This will test the response of the stakeholders. Such drills will keep workers alert and ensure response mechanism in the case of incidences are improved.
- Use signage to warn staff and/ or visitors that are not involved in construction activities.
- Restrict non-essential staff from the construction sites.

- Strict instructions shall be given for drivers of heavy equipment.
- Supervision of works shall be done regularly to ensure that safety conditions are met while any deviation from safety regulations is immediately reclaimed following the best practices regarding safety at work
- Develop evacuation procedures to handle emergency situations.
- Truck drivers should maintain a speed limit of not more than 20Km/hr.
- Speed controls by temporary speed bumps where necessary within the construction site.
- Clear marking of work site hazards and training in recognition of hazard symbols.
- Training of all personnel in fire prevention and protection.
- Regular inspection, testing and maintenance of equipment and machinery.
- Provide full first aid kits at the construction yard.
- Use of water sprays to arrest dust.
- Containment of hazardous materials.
- Provide adequate protective gear to construction workers.

4.9 IMPACTS DUE TO PROJECT OPERATION

The following sub-sections present the impacts due to the operation of the proposed project:

4.9.1 Air Emissions

Proposed project will use biogas and rice husk as fuel for steam generation. Biogas is a renewable, as well as a clean, source of energy. SO₂ emission of the project is less than emissions from coal and oil power plants. This is expected since the rice husk contains only about 0.4% sulphur³. Similarly, NO_x emissions from the project are also lesser than coal and oil power plants.

³ Chungsangunsit, T., Gheewala, S. H., & Patumsawad, S. (2005). Environmental assessment of electricity production from rice husk: a case study in Thailand. International Energy Journal, 6.

Mitigation Measures

- Electrostatic precipitator (ESP) will be installed to reduce Particulate matter (PM) emissions.
- Low NOx burner will be used to limit emissions by controlling the mixing of fuel and air.
- To facilitate wider dispersion of remaining particulates and gaseous pollutants (SO₂ and NOx), already established chimney of 160 ft height shall be used.
- To control emissions of fugitive dust within rice husk storage area, regular water sprinkling will be ensured.
- Environmental monitoring will be carried out to monitor stack emissions.
- Adequate greenbelt will be developed and maintained.

4.9.2 Wastewater

No process wastewater will be generated from the proposed project except boiler blowdown and cooling tower blowdown.

Mitigation Measures

- Blow down from boiler and cooling tower will be discharged in WWTP of Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.
- The treated effluent will be disposed of in Bharaianwala Drain.

4.10 Noise

The operational activities will generate noise from the steam turbine generators and other rotating equipment, combustion-induced noise, flow-induced noise, and noise from the steam safety valves.

Mitigation Measures

- The steam turbine generator will be housed in closed buildings to reduce the transmission of noise to the outside environment.
- Operation and maintenance personnel working within the machinery will be provided with adequate personal protection against noise.
- Also, all the measures will be taken to limit noise at the plant boundary within stipulated limits.

4.11 Ash

Ash will be produced by the burning of rice husk (and if bagasse or coal is used).

Mitigation Measures

Ash Handling and Transportation System

In general, ash is captured in various parts in the flue gas flow (outlined below) in the course of the combustion of rice husk (and if bagasse or coal is used) in the boiler until the flue gas is discharged from the stack.

- Ash which is produced by combustion falls to the bottom hopper of the boiler furnace and is captured. About 10 - 20% of the amount of all ash is captured in this way.
- Part of the combustion ash which floats in the flue gas falls to the bottom hopper of the economizer and the air heater in the downstream of flue gas and is captured. 5% or less of the amount of all ash is captured here.
- The combustion ash which is captured by the electrostatic precipitator is caught in the bottom hopper of the electrostatic precipitator. It is called fly ash. In general, 80 - 90% of the amount of all ash is captured here.
- The ash generated will be used as bed material/land filling material in project site.

4.12 Environmental Enhancement Measures

Tree plantation

Shade trees including sheesham, neem will be grown outside boundary of project. Grasses, median plants and median shrubs will also be grown. Aesthetic and beauty plants including roses and jasmine will be planted. Trees height will be between 3-7 ft. Spacing between plants will be 6-8m. Tree plantation will be done in open spaces and along boundary of project site.

CHAPTER 5
ENVIRONMENTAL
MANAGEMENT AND
MONITORING PLAN

5 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

An IEE report contains predictions about the environmental impacts of proposals and recommendations for their mitigation and management. The report is essentially a discretionary planning document. This section provides an overall approach for managing and monitoring environment and social issues and describes the institutional framework and resource allocations to implement the Environmental Management Plan (EMP) for the proposed project.

An environmental management plan (EMP), also referred to as an impact management plan, is usually prepared as part of IEE reporting. It translates recommended mitigation and monitoring measures into specific actions that will be carried out by the proponent. Depending upon particular requirements, the plan may be included in, or appended to, IEE report or may be a separate document. The EMP will need to be adjusted to the terms and conditions specified in any project approval. It will then form the basis for impact management during project construction and operation.

5.1 COMPONENTS OF ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The main components of an EMP are described in the table below, which reflects practice at the World Bank. Although there is no standard format, the EMP should contain the following.

Components of EMP

Components of an Environmental Management Plan (EMP)	
Summary of impacts	The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized.
Description of mitigation measures	Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under which it is required (for example,

	continuously or in the event of contingencies). These should be accompanied by, or referenced to, project design and operating procedures which elaborate on the technical aspects of implementing the various measures.
Description of monitoring programme	The monitoring program should clearly indicate the links between impacts identified in the IEE report and their monitoring parameters to be measure where appropriate.
Institutional arrangements	Responsibilities for mitigation and monitoring should be clearly defined, including arrangements for co-ordination between the various actors responsible for mitigation.
Implementation schedule	The timing, frequency and duration of mitigation measure should be specified in an implementation schedule, showing links with overall project implementation.
Cost estimates (Environmental budget)	These should be specified for both the initial investment and recurring expenses for implementing all measures contained in the EMP, integrated into the total project costs.

5.2 INSTITUTIONAL CAPACITY

Implementation of EMP is the responsibility of proponent and contractor. This section provides institutional arrangements for environmental management during the proposed activity and defines the roles and responsibility of the various Organizations/departments. The responsibilities of different organizations/departments are summarized below:

5.2.1 Proponent

Responsibility of Proponent includes the following:

- Must take ownership of the process to ensure that its responsibilities are met.
- Supervising construction works.

- Schedule preparation and resource forecasting for engineering and other technical activities relating to the project.

5.2.2 Contractor

The contractor of construction activities will be responsible for:

- Develop and review work instructions and procedures.
- Review and improve method statements for environmental aspects prior to work starting.
- Monitor construction activities to ensure that control measures are effective and ensure compliance with the EMP.
- Coordinate with construction teams to ensure that environmental risks are identified and appropriate controls are developed.
- Coordinate environmental training for site personnel and subcontractors.
- Liaison with the project's environmental manager, and project public liaison officer.
- Ensure correct procedures are followed in the event of an environmental incident.
- Maintain training register, identify training needs and provide training where required.

5.2.3 EIA/IEE Expert

EIA/IEE Expert (Environmental Specialist) is the member of the supervising consultant's team. The responsibilities of EIA/IEE Expert include:

- Work with proponent to ensure all statutory environmental submissions under PEPA 1997 (Amended 2012) and other environmentally related legislation are thoroughly implemented.
- Work with proponent to ensure all environmental requirements and mitigation measures from the environmental assessment of the proposed project are included in the contract prequalification and bidding documents.



- Work with proponent to execute any additional IEE requirements needed due to fine tuning of the proposed project and that environmental performance targets are included in the contracts prior to project commencement.

5.3 TRAINING SCHEDULE

Proponent will be responsible for providing health and safety training, and briefing environmental requirement of the project o workers and its staff before the commencement of work. Training workshops would be conducted twice a year to share the monitoring report on the implementation of the EMP.

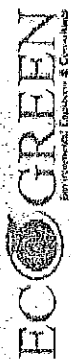


Table 18: ENVIRONMENTAL MANAGEMENT PLAN

Activity (Summary of Impacts)	Mitigation Measures	Implementation Schedule (Timing/Frequency)	Institutional Capacity (Responsibility)
<u>DESIGN/PRECONSTRUCTION STAGE</u>			
Layout and Design Preparation of design documentation for proposed construction. Procedures for approval of design documentation	<ul style="list-style-type: none"> The design process should be carried out in recognition of identified hazards and risks assessment. Accepted design solutions should focus on maximum possible opportunity for risks reduction. 		Proponent/ Environmental Specialist/ Contractor
	<ul style="list-style-type: none"> Carry out engineering surveys including environmental surveys depending on the level of complexity and potential hazards 	During preliminary surveys and investigations	

<p>Access to Site</p> <p>Sound environmental principles must be followed whilst establishing access to the site</p>	<p>of the planned facilities in the area of planned construction.</p> <ul style="list-style-type: none"> The detailed engineering and equipment specifications must conform to acceptable national and international standards. Include enhancements, techniques to reduce impacts. The location of all access points to the proposed project site must be identified and confirmed. Marking of survey points must be done with the Proponent's approval. Ensure that all site personnel have a basic level of environmental awareness 	<p>Prior to moving onto site</p> <p>During surveys and preliminary investigations</p> <p>Proponent/ Contractor</p>
<p>Training of Site Staff on General Environmental Conduct</p>		

INITIAL ENVIRONMENTAL EXAMINATION



These points need to be made clear to staff on site before the project begins	training.	Proponent/ Contractor
	<ul style="list-style-type: none"> • The Contractor must submit a proposal for this training to the workers for approval. • Site policy also needs to be explained to the construction workers. • No alcohol / drugs to be present on site. • No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel). • Prevent excessive noise. • Prevent unsocial behavior. • No harvesting of firewood from the site or from the adjacent areas. 	During staff induction and ongoing

[Signature]

[Signature]

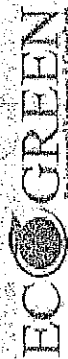
<p>Social Impacts – Visual & Noise</p> <p>It is important to take notice of the needs and wishes of those living of working adjacent to the site. Failure to do so can cause disruption to work and increase costs in the form of delays</p>	<ul style="list-style-type: none"> • Trespassing on private / commercial properties adjoining the site is forbidden. • Other than the pre-approved security staff, no workers should be permitted to live on site. • During the set up phase of the project, the Proponent and Consultant need to make contact with those people that are interested or affected by the development. • Construction vehicles are to be fitted with standard silencers prior to the beginning of construction. • Equipment that is fitted with noise reduction facilities should 	<p>Prior to moving onto site/ On site Feedback</p> <p>Proponent/ Contractor/ Environmental Specialist</p>
---	--	---

	be used as per operating instructions and maintained properly during site operations.	During surveys and preliminary investigations and site set up	
	<ul style="list-style-type: none">• Storage facilities and other temporary structures on site should be located such that they have as little visual impact on local resident as possible.		
Cultural Environment	<ul style="list-style-type: none">• Prior to the commencement of construction, contractor needs to know if any possible archaeological or historical objects of value are present near the project site.• Inform the relevant department in case of any disturbance to cultural environment.	During surveys and preliminary investigations and site set up	Proponent/ Contractor

CONSTRUCTION STAGE

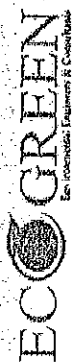
Air Pollution/ Dust Exhaust gases from vehicles and machinery and dust during excavation, backfilling, compaction activity and movement of vehicles on un-paved roads Establishment of the camp site, and related temporary works can reduce air quality.	Monitoring of gaseous emission should be conducted by 3 rd party. Well maintained machinery should be used at site and its regular monitoring should be ensured. Use of water sprays to decrease dust generation. Workers will be provided with Personal Protective Equipments (PPEs) such as face masks and goggles.	Throughout Construction Phase	Proponent/ Contractor
---	---	-------------------------------	--------------------------

INITIAL ENVIRONMENTAL EXAMINATION



<p>Water Resources</p> <ul style="list-style-type: none"> • Availability of water will be assessed to evaluate the impact on community resources. • Water should be obtained without depleting local water supplies. • Guidelines should be established to minimize the wastage of water during construction. • Protection of groundwater reserves from any source of contamination such as the construction and oily waste that will degrade its potable quality. 	<p>Proponent/ Contractor</p> <p>Throughout Construction Phase</p>
<p>Wastewater</p> <ul style="list-style-type: none"> • No hazardous untreated effluents should be released to the environment. • Open stockpiles of construction 	<p>Proponent/ Contractor</p> <p>During Construction</p>

INITIAL ENVIRONMENTAL EXAMINATION



	materials on site should be covered with tarpaulin or similar fabric during rainy season;	Phase	Contractor
Soil Erosion	<ul style="list-style-type: none"> Prevent the washing away of construction materials, soil, silt or debris into any drainage system; All machinery and equipment should be regularly maintained and serviced to avoid leak oils; Avoid creating excessive slopes. Save top soil removed during construction and use to reclaim disturb areas, as soon as it is possible to do so. 	During Construction Phase	Proponent/ Contractor
Solid Waste Debris and surplus construction material	<ul style="list-style-type: none"> Confirm amounts of surplus rock based materials can be reused in the project or by other interested parties for public projects. 	During Construction Phase	Proponent/ Contractor

INITIAL ENVIRONMENTAL EXAMINATION



<p>Noise</p> <p>Construction activities are expected to increase the noise levels mainly due to plying of construction vehicles, mechanical machinery such as cranes, hammering etc.</p>	<ul style="list-style-type: none"> • All machinery should be fitted with acoustic insulation. • Providing the construction workers with suitable hearing protection like earmuffs and training them in their use. 	<p>During Construction Phase</p>	<p>Proponent/ Contractor</p>
<p>Equipment Maintenance</p>	<ul style="list-style-type: none"> • Prepare and keep the record of equipment maintenance log. • Prepare proper maintenance sheets for vehicles. • Use fully tuned vehicles and machinery. 	<p>During construction</p>	<p>Proponent/ Contractor</p>
<p>Workers and Public Safety</p>	<ul style="list-style-type: none"> • Safety conditions during construction phase should be ensured. • Safe access and thoroughfare 		

[Handwritten signature]

INITIAL ENVIRONMENTAL EXAMINATION



	During construction	Proponent/ Contractor
Social Impacts	must be provided on site at all times. Dangerous areas should be clearly identified with appropriate signs.	
	<ul style="list-style-type: none"> • Providing every worker with skull guard or hard hat and safety shoes. 	
	<ul style="list-style-type: none"> • Conduct proper worker health and safety training and orientation prior to initiation of tasks. 	
	<ul style="list-style-type: none"> • Use local labour as far as possible for manual work. 	
	<ul style="list-style-type: none"> • Use local educated people for clerical and office work where possible. • Contractor's activities and movement of staff to be 	

INITIAL ENVIRONMENTAL EXAMINATION



	restricted to designated construction areas.	During Construction Phase	Proponent/ Contractor
<p align="center">Site Restoration</p>	<ul style="list-style-type: none"> The site must be kept clean to minimize the visual impact of the site. 		
	<ul style="list-style-type: none"> Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors. 		
	<ul style="list-style-type: none"> Noisy activities must be restricted to the designated time. 		
	<ul style="list-style-type: none"> Carry out complete restoration of the construction sites. 		
	<ul style="list-style-type: none"> Remove all waste, debris, unused construction material, and spoil from the worksites. 	After completion of project	Proponent/ Contractor
	<ul style="list-style-type: none"> Measures taken to control 		

[Signature]

[Signature]

erosion will include clearing and grading the ground surface within approved work limits, stripping the top soil layer from the subsoil, stockpiling the removed soil in approved areas to be retrieved during landscaping and site restoration.

- Replanting the original vegetation after construction.

OPERATIONAL STAGE

Wastewater

- Blowdown from boiler and cooling tower will be discharged in already installed ETP of Premier Industrial Chemical Mfg. Co. (Pvt.) Ltd.
- Monitoring of wastewater should

Operational phase Proponent

be carried out quarterly by 3rd party to ensure compliance with the PEQS.

Air Emissions

- Electrostatic precipitator (ESP) will be installed to reduce Particulate matter (PM) emissions.
- Low NOx burner will be used to limit emissions by controlling the mixing of fuel and air.
- To facilitate wider dispersion of remaining particulates and gaseous pollutants (SO₂ and NOx), already established chimney of 160 ft height shall be used.

	Proponent
Fire Hazard	Operational Phase
<ul style="list-style-type: none"> • To control emissions of fugitive dust within and around the rice husk storage area, regular water sprinkling will be ensured. • Environmental monitoring will be carried out to monitor stack emissions. • Adequate greenbelt will be developed and maintained. • Install fire-fighting equipments in the entire building. • Fire exit should be made which should be considered at the design phase. • Train employees to use fire fighting equipments at the time of emergency. • Safety signs should be displayed 	

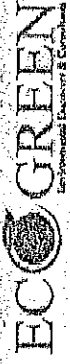
[Signature]

INITIAL ENVIRONMENTAL EXAMINATION



	at designated places.	Operational Phase	Proponent
Ash	<ul style="list-style-type: none"> Assembly points should be marked for any emergency situation Ash which is produced by combustion falls to the bottom hopper of the boiler furnace and is captured. About 10 - 20% of the amount of all ash is captured in this way. Part of the combustion ash which floats in the flue gas falls to the bottom hopper of the economizer and the air heater in the downstream of flue gas and is captured. 5% or less of the amount of all ash is captured 		

INITIAL ENVIRONMENTAL EXAMINATION



here:

- The combustion ash which is captured by the electrostatic precipitator is caught in the bottom hopper of the electrostatic precipitator. It is called fly ash. In general, 80 - 90% of the amount of all ash is captured here.

The ash generated will be used as bed material/land filling material in project site.

5.4 ENVIRONMENTAL MONITORING PLAN

An environmental monitoring plan provides a delivery mechanism to address the adverse environmental impacts of a project during its execution, to enhance project benefits, and to introduce standards of good practice to be adopted for all project works. An environmental monitoring program is important as it provides useful information and helps to:

- Assist in detecting the development of any unwanted environmental situation, and thus, provides opportunities for adopting appropriate control measures, and
- Define the responsibilities of the project proponents, contractors and environmental monitors and provides means of effectively communicating environmental issues among them.
- Define monitoring mechanism and identify monitoring parameters.
- Evaluate the performance and effectiveness of mitigation measures proposed in the Environment Management Plan (EMP) and suggest improvements in management plan, if required,
- Identify training requirement at various levels.

An environmental monitoring plan is suggested to monitor environmental parameters during survey, construction and post construction phase of the project.

Following environmental record should be maintained:

- Incident record of all moderate and major spills and other incidents and accidents. The record will include:
 - ✓ Location of spill or Spilled material
 - ✓ Estimated quantity or the amount of injury
 - ✓ Nature of injury or loss (temporary or permanent)
 - ✓ Restoration measures
 - ✓ Photographs
- Description of any damage to vegetation, water resource, or community asset.
- Corrective measures taken, if any

- Waste Tracking Register that will hold records of waste generated during the construction period. This will include quantities of waste disposed, recycled, or reused.
- Records of water consumption with usage breakdown
- Survey reports, in particular, the following:
 - ❖ Vehicle and equipment noise.
 - ❖ Ambient noise survey reports.
 - ❖ Ambient level of PM
 - ❖ Vendor data—all vendors disturbed by the project and compensation paid Public infrastructure: Record of all damages and repair work undertaken.
 - ❖ Employment
 - ❖ Total number of unskilled, semi-skilled, and skilled jobs offered during Construction.
 - ❖ Name and domicile of the employed staff.
 - ❖ Project and Community Interface
 - ❖ Record of community complains and the measures taken to address them.
 - ❖ Number of meetings held in various communities and data of persons who attended
 - ❖ Environmental and social training records.

Table 19: ENVIRONMENTAL MONITORING PLAN FOR CONSTRUCTION AND OPERATIONAL PHASE

Environmental Quality	Parameters	Details of Location	Standards/ Guidelines	Frequency	Responsibility
CONSTRUCTION PHASE					
Waste Collection, Storage and Disposal	Inspection of Waste Generation, collection, Storage and Disposal at site	Construction Site	Statutory Requirements	Once a week	Environmental officer/manager
Workers safety	Injuries and accidents	Recording injuries	-	Onsite	HSE/contractor
Air Quality	Air Quality (PM ₁₀) (CO, NO _x , SO _x)	Active Construction Area	PEQS	Once a month	Environment Officer /manager
Water Quality	Groundwater Quality (pH, TDS, Total hardness, Alkalinity, Nitrates, Chloride, Sodium, iron)	Groundwater sources near the project site	PEQS	Once a month	Environment Officer /manager

Noise Level	Noise level on dB (A) Scale	At least three locations near boundary	PEQS	At least 3 working days	Environment Officer /manager
OPERATIONAL PHASE					
Ambient Air Quality	CO, NO _x , SO _x , SPM, PM ₁₀	Operational area	PEQS	Quarterly	Environment Officer /manager
Noise Level	Noise level on dB (A) Scale	Noise level near the receptor	PEQS	Quarterly	Environment Officer /manager
Safety	Injuries	Injuries will be recorded	-	Daily	HSE Officer

5.5 EQUIPMENT MAINTENANCE DETAILS

This section highlights the importance of proper maintenance as a vital part of a safety program. In addition to ensuring that workers use the tools and equipment properly, it is vital that tools and equipment be properly inspected, maintained, and kept in good repair. This maintenance program will reduce the risk of injury, damage and lost production.

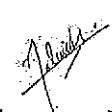
Maintenance Personnel Qualifications

The qualifications of maintenance personnel are key to the success of a maintenance program. All individuals who perform maintenance work will have the appropriate skills, accreditation and/or certification.

Operator Qualifications and Training

All individuals who operate boilers, turbines etc will have the appropriate skills, and experience. This applies to both company employees and contracted equipment services. The approval process includes the following:

1. Possession of a valid license appropriate to the type of equipment.




2. Vision test to meet the appropriate standard. Vision tests must be conducted by competent and authorized personnel.
3. Hearing test with or without a hearing aid must be adequate for the specific operation. Hearing tests will be conducted by competent and authorized medical personnel.
4. The operator shall be trained in the following:
 - their responsibilities to operate the equipment in a safe manner;
 - familiarity and comprehension of safety requirements for the piece of mobile equipment which they intend to operate;
 - manufacturer's operating and maintenance procedures;
 - how to communicate to maintenance personnel when there is a problem with a specific piece of equipment;
 - hand signals and/or other requirements set by the company, owner, or dictated by site conditions.

Records

The maintenance program contains a recording system. Part of this system should be made up of inventories and schedules. In addition, the recording system should document what maintenance work was done, when, and by whom.

Scheduled Inspections and Maintenance

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

Maintenance of equipment, release of lubrication fluids, etc., is performed only in approved areas. Spills and leaks from equipment will be cleaned up promptly.

- Only properly trained workers are to use tools, equipment and vehicles.
- Inspect all tools, equipment and vehicles before using.
- For vehicles, inspection will consist of doing a circle check.
- If applicable, maintenance schedules for all tools, equipment and vehicles are to be respected.
- Each jobsite supervisor is to conduct a bi-weekly inspection of all tools,



equipment and vehicles on the site. This inspection is recorded bi-weekly using an Inspection Checklist.

- If at any time a worker judges that a tool, equipment or vehicle is unsafe for use, they are to properly tag the item and inform the supervisor immediately.
- Tools, equipment or vehicles that are tagged unsafe shall be either repaired or replaced. Head office shall be informed.

5.6 ENVIRONMENTAL BUDGET

Approximately 2.5 million PKR per year budget will be reserved for tree planation, PPEs, fire-fighting and environmental monitoring.

CHAPTER 6

CONCLUSION
AND
RECOMMENDATIONS

6 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The report presents Initial Environmental Examination (IEE) of the proposed project of 8 MW Steam Turbine at 9 km Lahore Road, District Sheikhpura.

IEE of proposed project is performed according to guidelines of EPA. It includes description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study.

The IEE elaborates all anticipated impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these are within acceptable limits. Moreover, no deterioration, depletion or exploitation of resources is expected to be caused by this project.

Based on overall assessment of the environmental impact 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.

It is accordingly recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

6.2 RECOMMENDATIONS

The IEE study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, ear muffs, mufflers, goggles, gloves and shoes etc. should be provided to workers.
- Strictly following standard operating procedures and proper use of personal protective equipment (PPE)

- Installation of fire extinguishers in the premises and their monitoring must be ensured.
- Equipment maintenance and efficiency must be checked.
- No compromise on public health and environment should be allowed.
- Proper tree plantation plan should also be developed in order to make the project site environment friendly.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- The proposed Environmental Management & Monitoring Plan should be implemented.

