

SCHEDULE 1

(REGULATION 3(1) FORM OF APPLICATION

October 26, 2017

The Registrar,
National Electric Power Regulatory Authority

Subject: <u>APPLICATION FOR A GENERATION LICENSE.</u>

I, Syed Ibrahim Ahmad, Executive Director OF M/S Nasir Absar Consulting, being duly authorize representative of M/S Jilani Energy (Pvt.) Ltd. by virtue of Board Resolution, hereby apply to the National Electric Power Regulatory Authority for the grant of a Generation License to the Jilani Energy (Pvt.) Ltd. pursuant to section 15 of the Regulation of Generation, Transmission and Distribution of Electric Power Act 1997.

I certify that the documents-in-support attached with this application are prepared and submitted in conformity with the provisions of the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, and undertake to abide by the terms and provisions of the above-said regulations further undertake and confirm that the information provided in the attached documents-in-support is true and correct to the best of my knowledge and belief.

A Pay Order No. 10128530 is the sum of Rupees 143,008/- (Rupee One Hundred Forty-Three Thousand and Eight Only), being the non-refundable license application fee calculated in accordance with Schedule II to the National Electric Power Regulation Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Date: October 26, 2017

Syed Horahim Ahmad, Executive Director

COMPLIANCE WITH REGULATIONS

October 26, 2017

Name of Company: Jilani Energy (Private) Limited

Plant Capacity: <u>6.5 MW</u>

Project Location: 17-KM Sheikhupura Road, Lahore

Contact Details: Sheikh Shahzeb Jilani, Director, Jilani Energy (Pvt.) Ltd., 17-KM Sheikhupura.

Regulation No. 3(1) – Application for license:

Board Resolution submitted with the application.

• Regulation No. 3(2) - Application Fee:

Pay Order No. 10128530 of Habib Metropolitan Bank Ltd. amounting PKR 143,008/dated 22-07-16 revalidated w.e.f 16-02-2017.

Regulation No. 3(4) – Copies of Application:

Submitted in triplicate.

Regulation No. 3(5)-A(i) - Certificate of Incorporation:

Attached as Annexure-A

• Regulation No. 3(5)-A(ii) – Memorandum of Articles of Association:

Attached as Annexure-B.

• Regulation No. 3(5)-A(iii) – Latest financial statement:

Jilani Energy (Pvt.) Ltd. has recently be incorporated as a Special Purpose Vehicle for the project. Jilani Energy (Pvt.) Ltd. is wholly owned company by the directors of Javaid International (Pvt.) Ltd. and Jilani Poly Industries (Pvt.) Ltd. therefore, the annual financial statements of 2014-2015 of the sister-concerned company is submitted along with the wealth statement of directors of the company. Financial statements and wealth statement are attached as Annexure-C.

• Regulation No. 3(5)-b – Applicant Profile:

Applicant Profile has been attached as Annexure-D

• Regulation No. 3(5)-c – Curriculum Vitae:

CVs of management and technical staff has been attached as Annexure-E

• Regulation No. 3(5)-d – Profile of Sub-Contractor:

Profile of sub-contractors has been attached as Annexure-F

Regulation No. 3(5)-A(iv) and Schedule III-Regulation 3(6)A-(a)-1—Location (location map, site map):

The project is located at 17-km, Lahore-Sheikupura road near Jilani Plastic. The Coordinates of the area are: 31.647534, 74.185070

The location is accessible from Islamabad through Islamabad Motorway (M2). The distances are:

Islamabad Motorway to Kot Abdul Malik Motorway Exchange	332 km
Kot Abdul Malik Toll Plaza to Jilani Energy	7.4 km

The google map of the location and the topographic survey has been attached as an Annexure-G.

Regulation No. 3(5)-A(v) and Schedule III-Regulation 3(6)A-(a)-2 – Type of Technology:

- Production capacity of the power plant electricity output from Generator: 1 *
 6.5 MW.
- Boiler: 1 * 35t/h Coal Fired Boiler; Steam Pressure: 6.5MPa; Steam Temperature:
 480 Celsius Steam Turbine: 1 * 6.5MW condensing, 6.5MPa, 470 Celsius.
- Generator: 1 * 6.5 MW generator, 1500rpm, 11kV, Static excitation.
- Circulating Cooling Water: Fresh water circulating water system (Mechanical draft cooling system).
- Electric System: Medium voltage (11kV) electricity from generator outgoing feeder panel; low voltage (400V) system from supply electricity to power plant itself only.

The power plant adopts to both local and imported coal as fuel, whichever is more economical.

Feasibility Study Report along with the civil drawings, Soil Investigation Report, Plant layout and topographic Survey is attached as Annexure-H.

Regulation No. 3(5)-A(vi) – Number of Units (No.)/Size (MW):

One unit will be installed with the plant capacity of 6.5 MW

• Regulation No. 3(5)-A(vii) – Year Make/Model, Operation Date and expected remaining life:

Boiler Xing Fu Boilers China, 35 t/h CFB turbine Dresser RAND PBH T156065.

Year Make: April 2009. FRAM-12-Steam Turbine

Remaining Life: 20 years

- Regulation No. 3(5)-A(viii) Installed Capacity, de-rated capacity, Auxiliary Consumption, Net Capacity:
 - Installed Capacity: 6.5 MW
 - Auxiliary Consumption: 950 KW
 - Net Capacity: 5.55 MW
- Regulation No. 3(5)-A(ix) and Schedule III-Regulation 3(6)(a)-3 Fuel: type, imported/indigenous, supplier, logistics, pipelines etc.
 - Jilani Energy (Pvt.) Ltd. will use Coal as its fuel. It will use both imported and indigenous coal at the rate of 4981 Calorific Value/kg. Coal consumption for power generation is 622g/kWh.
 - There are number of local and international suppliers that are already providing coal.
 - Daily consumption of plant is expected is expected to be around 97.03 tons.
 - Pipelines are not applicable.
- Regulation No. 3(5)-A(x) Supply Voltage (11kV/132 kV), in case of 132 kV voltage distance and name of nearest grld (Signle Line Diagram):

Medium voltage (11kV) electricity from generator outgoing feeder panel; low voltage (400V) system from supply electricity to power plant itself only.

- Regulation No. 3(5)-A(xi) and Schedule III-Regulation 3(6)(a)-13— Plant Characteristics: Generation voltage, frequency, power factor, automatic generation control, ramping rate, alternative fuel, time(s) required to synchronize to grid:
 - Generation voltage: 11 kV
 - Frequency: 50 Hz
 - Power Factor: 0.8
 - Automatic Generation Control: Yes
 - Ramping Rate: 3 hours on cold / 30 minutes on hot.
 - Alternative Fuel: Not applicable
- Time(s) required to synchronize to grid: Not applicable

• Regulation No. 3(5)-A(xii) and Schedule III-Regulation 3(6)(a)-14— Provision of Metering, Instrumentation, Protection and Control arrangement:

Control, Metering, Instrumentation and protection will be in accordance with ISA (The International Society of Automation) standards. Detail Interconnection study has been provided in the Annexure-F "Interconnection Study Report".

SCHEDULE-III Regulation 3(6)-A(a) NEW GENERATION FACILITIES (THERMAL)

1. Emission Values:

A. SO2:

26.014 ug/m³

B. NOX:

50.276 ug/m³

C. CO:

2.975 mg/m³

D. Particulate:

141 ug/m³

Details monitoring reports are attached as Annexure-I

2. Cooling Water Source:

Ground Water

3. Interconnection:

The power generation unit will not be connected to the National Grid. However, Single Line Diagram and Detail Study Report provided is in Annexure-J.

4. Infrastructure:

Open and easy metaled road access is available to the project site. The staff of the plane will be provided residential facilities with all basic amenities within the premises of the plant. As shown in the site location map the plant is situated at distance of only few kilometers from Motorway Exchange and main Lahore-Sheikhupura Road.

5. Project Cost:

The total project cost has been estimated at USD 3.940 Million. Jilani Energy is committed to invest whole project cost as part of their equity. No loan is required to complete the project.

6. Project Commencement and Completion Schedule:

The expected period for the completion of the project is estimated as 24 months. The project commencement date is October 2016.

7. Environmental Study Report:

Environmental study report has been attached as Annexure – K along with the submission letter to EPA Punjab.

8. Safety and Emergency Plans:

A Comprehensive safety and emergency plan would be implemented to provide a safe and protected working environment to the staff working at the facility.

Key features of the safety plan are given below:

A. Awareness regarding safety measures

All the staff working at the facility will be given detail briefings regarding different types of safety measures so that they would be able to identify risks and to take necessary measures of safety and protection during their working.

B. Trainings to react on an emergency alert alarm

All the staff working at the facility will be provided necessary trainings regarding how to react an emergency alert -alarm.

B. Trainings for proper use of Safety Gears and Equipment

All the staff working at the facility will be provided necessary trainings regarding how to use the safety gears and equipment in proper way for better safety.

C. Use of Safety Gears and Equipment

The staff working at the facility will be provided all necessary safety gears and protection equipment for use during working at the facility.

D. Safety procedures and practices

Use of proper safety gears and protection equipment shall be mandatory for all the staff of the facility.

E. Emergency Alarm

Access to emergency alarm will be made easy to raise the emergency alarm in case of any type of emergency.

F. Emergency Help Call Numbers

Emergency help call numbers will be displayed in bold on prominent places in the facility.

D. Emergency escape procedure and routes

The staff working at the facility will be made aware of the Emergency escape routes and procedure for a quick and safe escape. Emergency escape procedure and routes maps will be displayed on prominent places in the facility.

G. Shutdown of Operating Systems or Equipment's

The Emergency Control Team shall be responsible to ensure immediate shutdown of operation systems and Equipment if required in the emergency situation. Necessary equipment will also be installed for the emergency shutdown of the operating systems and equipment.

H. First Aid Facilities and Staff

The availability of first aid facilities and necessary staff to provide urgent and immediate first aid facilities will be ensured at the facility.

M. Protection of Data and Record

Duplicate of all necessary data and record will be prepared 'and placed at some safe place for its safety and security of the data and record.

I. Ambulances

Availability of ambulance service at the facility will be ensure for quick shifting to the staff members to hospitals in case of any accident and health hazards.

 System Studies: The power generation unit will not be connected to the National Grid. However, Single Line Diagram and Detail Study Report provided is in Annexure-J

10. Training and Development:

Training of the Project Operational and Management Staff:

The project shall be constructed and installed by the contractor firm, The agreement with the Contractor shall include the facility of Training of the Operational Staff of the facility.

The contractor will be obliged to provide a comprehensive practical training to all the operation and management staff of the facility to enhance their capability to run the project successfully without any fault or failure.

The experienced and trained staff of The Contractor will provide necessary trainings and briefings and also provide backup supervision practical assistance till the successful running of the facility by the staff of the facility.

Jilani Energy Pvt. Ltd. has also planned to arrange further necessary trainings for the capacity building of facility staff in future.

Development Program

Jilani Energy Pvt. Ltd. has also planned to provide necessary facilities, information and resources to the facility operational and management staff to avail technical and personal development opportunities to run the project in more smooth and swift manner.

11. Feasibility Report Attached as Annexure-H



BOARD RESOLUTION

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF THE COMPANY IN ITS MEETING HELD ON JUNE 06, 2016 AT ITS REGISTERED OFFICE 92-MAIN RAVI ROAD LAHORE, AT 10:30 AM.

Resolved that SYED IBRAHIM AHMAD, EXECUTIVE DIRECTOR, HAVING CNIC No. 61101-1789518-5 of M/S NASIR ABSAR CONSULTING (PVT.) LTD. is authorized representatives on behalf of the Company for the purpose of filing an application for Generation License for 7 MW Coal power project and to submit before NEPRA under the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 and the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999. The representatives are also authorized to attend any/ all meeting(s) and discussions related to the Generation License and to provide any information and documents needed in this regard.

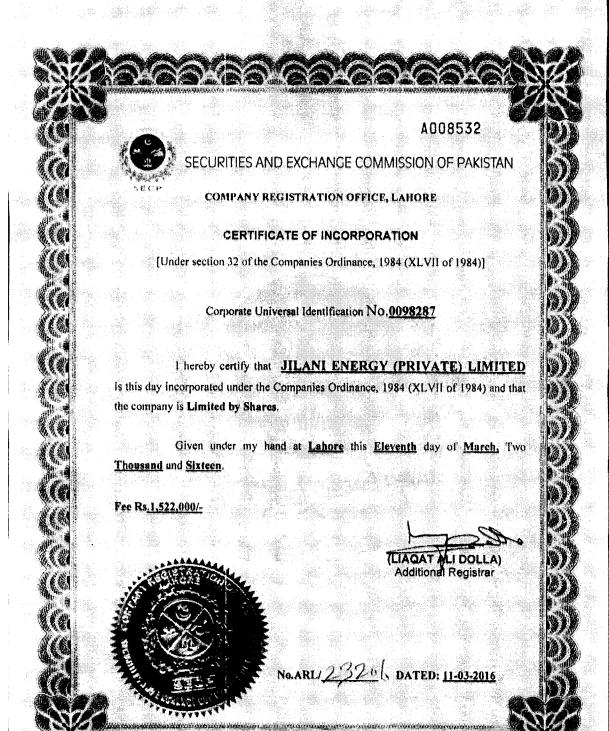
This resolution will remain in force unless revoked; a notice in writing be forwarded to NEPRA of any such effect(s).

Company Secretary (Sign and Stamp)

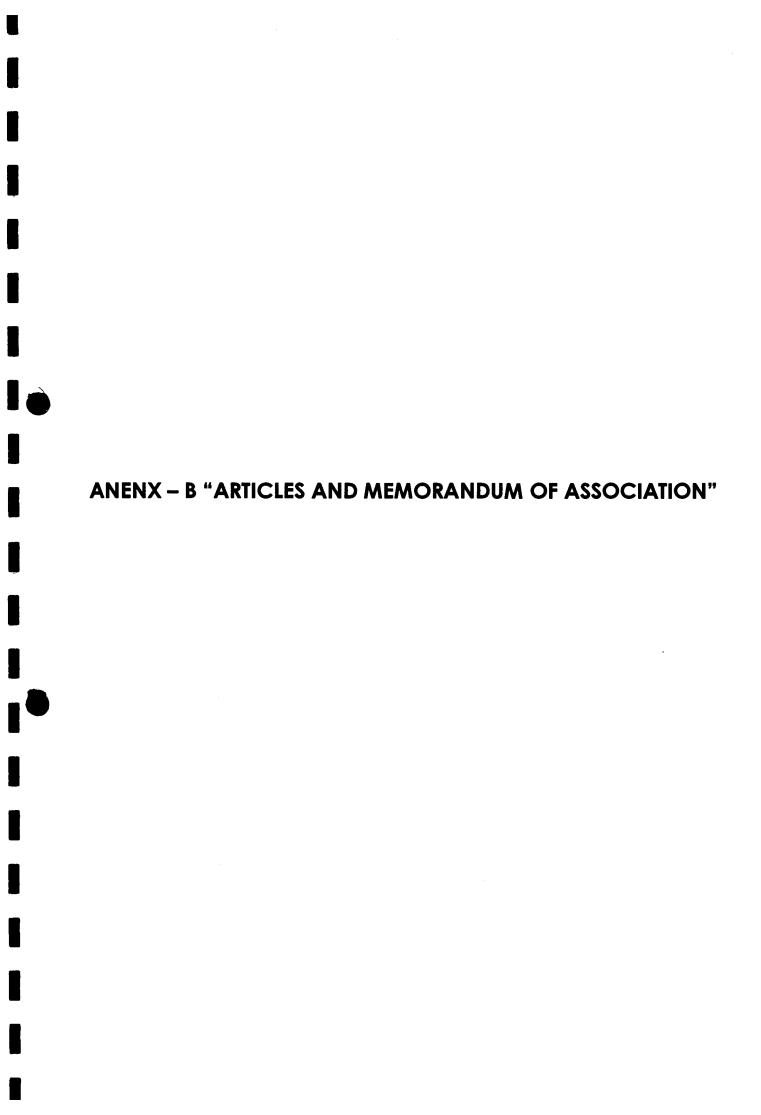
Head Office: Jilani Centre, 92-Ravi Road, Lahore. Factory: 17-KM Sheikhupura Road, Lahore.

UAN: 042-111-200-600 Fax: 042-37720349

ANENX - A "INCORPORATION CERTIFICATE"



JOINT REGISTPAR OF COMPANIES GOMPANY REGISTRATION OFFICE



THE COMPANIES ORDINANCE, 1984

(COMPANY LIMITED BY SHARES)

ARTICLES OF ASSOCIATION

OF

JILANI ENERGY (PRIVATE) LIMITED

PRELIMINARY

1. Subject as hereinafter provided, the Regulations contained in Table 'A' of the First schedule to the Companies Ordinance, 1984, (hereinafter referred to as Table 'A') shall apply to the company so for as those are applicable to Private Companies, with the exception of the Regulations which are modified, altered or added hereunder.

PRIVATE COMPANY

- 2. The Company is Private Company within the meaning of Clause (28) of Section 2(1) of the Companies Ordinance, 1984 and accordingly:
 - a) No invitation shall be issued to the public to subscribe for any shares, debentures or debenture-stock of the Company.
 - b) The number of members of the Company (exclusive of persons in the employment of the Company) shall be limited to fifty provided that for the purpose of this provisions when two or more persons hold one or more shares in the company jointly they shall for the purpose of this clause be treated as a single member; and
 - c) The right to transfer shares in the Company is restricted in the manner and to the extent hereinafter appearing.

BUSINESS

- 3. The Company is entitled to commence business from the date of its incorporation.
- 4. The business of the Company shall include all or any of the objects enumerated in Memorandum of Association.
- 5. The business of the Company shall be carried out at such place or places in the whole of Pakistan or elsewhere as the Directors may deem proper or advisable from time to time.

CAPITAL

- 6. The Authorized Capital of the Company is Rs. 500,000,000/- (Rupees Five Hundred Million Only) divided into 5,000,000 (Five Million) ordinary shares of Rs.100/- (Rupees One Hundred Only) each with powers to increase, reduce, consolidate, sub-divide or otherwise reorganize the share capital of the Company.
- 7. The shares shall be under the control of the Board of Directors who may allot or otherwise dispose of the same to such persons, firms, corporation or corporations on such terms and conditions and at any such time as may be thought fit.
- 8. The shares in the Capital of the Company may be allotted or issued in consideration of any property, land, machinery or goods supplied or any services rendered to the Company or promotion or formation of the Company or conduct of its business and any shares so allotted may be issued as fully paid shares.

SHARES, TRANSFER AND TRANSMISSION

- 9. Every person, whose name is entered, as a member in the Register of Members shall without payment, is entitled to a certificate under the Common Seal of the Company specifying the shares held by several persons. The Company shall not be bound to issue more than one certificate and delivery of a share certificate to any one of several joint holders shall be sufficient delivery to all.
- 10. The Directors may decline to register any transfer of share to transferee of whom they do not approve and shall be bound to show any reasons for exercising their discretion subject to the provisions of Sections 77 and 78 of the Companies Ordinance, 1984.
- 11. No share can be mortgaged, pledged, sold, hypothecated, transferred or disposed-off by any member to a non-member without the previous sanction of the Directors.
- 12. The legal heirs, executors or administrators of a deceased holder shall be the only persons to be recognized by the Directors as having title to the shares. In case of shares registered in the name of two or more holders the survivors and the executors of the deceased shall be the only persons to be recognized by the Company as having any title to the shares.

GENERAL MEETING

13. The first Annual General Meeting, shall be held within 18 months from the date of incorporation of the Company in accordance with the provisions of Section 158 and thereafter once at least in every year and within a period of four months following the close of its financial year and not more than fifteen months after the holding of its last preceding Annual General Meeting as may be determined by the Directors. The Directors may, whenever they think fit, call an Extra Ordinary General Meeting of the shareholders in terms of Section 159 of Companies Ordinance, 1984.

PROCEEDINGS AT GENERAL MEETING

- 14. Twenty-one days' notice at least specifying the place, day and hour of the General Meeting and in case of special business the general nature of such business, shall be given to the members in the manner provided in Table 'A' but accidental omission to give such notice to or non-receipt of such notice by the member shall not invalidate the proceedings of the General Meeting.
- 15. The Chief Executive, with the consent of a meeting at which quorum is present and shall if so directed by the meeting may adjourn the meeting from time to time and from place to place, but no business shall be transacting at any adjourned meeting other than the business left unfinished at the meeting from which the adjournment took place.

QUORUM

16. No business shall be transacted at any General Meeting unless a quorum of members is present at the time when the meeting proceeds to the business. Two members, present in person, representing not less than 25% of the total voting power either own account or as proxies, shall form a quorum for a General Meeting.

VOTES OF MEMBERS

- 17. At any General Meeting a resolution put to the vote of the General Meeting decided on a show of hands, unless a pole is demanded in accordance with the provisions of section 167 of the Companies Ordinance, 1984.
- 18. On a show of hands every member present shall have one vote and on a poll, every member present in person or by proxy shall have one vote in respect of each share held by him.
- 19. The instrument appointing a proxy and the power of attorney or other authority under which it is signed or notarially certified copy of that power of attorney or authority shall be deposited at the Registered Office of the Company not less than forty-eight hours before the time for holding the meeting at which the person named in the instrument proposes to vote and in default, the instrument of proxy will not be treated as valid.

CHAIRMAN

20. The Directors may from time to time appoint one of their members to be the Chairman of the Company for a period not exceeding three years on such terms and conditions as they deem fit. The Chairman shall preside over the meetings of the Board of Directors and members of the Company. In his absence, the Directors may elect one of them to preside over Board's/General Meetings. The questions arising at the meeting of the Directors shall be decided by a majority of votes. In the case of equality of votes, the Chairman or the Director presiding over the meeting, as the case may be, shall have a casting vote.

CHIEF EXECUTIVE

21. The first Chief Executive of the Company will be appointed by the Board of Directors within fifteen days from the date of incorporation of the Company who shall hold office till the first Annual General Meeting subsequently within fourteen days from the date of election of the directors.

DIRECTORS

- 22. Unless otherwise determined, the number of Directors shall not be less than two. The following are the first Directors of the Company.
 - 1. Mr. SHAHZEB JILANI
 - 2. Mr. AHSAN ASHRAF
- 23. The election of the Directors shall be held in accordance with the provisions of Section 178 of the Companies Ordinance, 1984.
- 24. The first Directors including the Chief Executive shall hold office up to the first Annual General Meeting in accordance with the provisions of the Companies Ordinance, 1984, unless any one of them resigns earlier or becomes disqualified for being Directors or otherwise ceases to hold office.
- 25. A resolution for removing a Director shall not be deemed to have been passed if the number of votes against him is equal to, or less than the number of votes that would have been necessary for the election of Directors at the immediately preceding annual election of Directors in the manner aforesaid, but as provided under section 181 of the Companies Ordinance, 1984.
- 26. The remuneration of Directors except regularly paid Chief Executive and full time working Directors shall, from time to time, be determined by the Board of Directors but it shall not exceed Rs.500/- per meeting at which the Directors are present.
- 27. The Directors may sanction the payment of such additional sums as they may think fit to any director for any special service he may render to the Company or be though capable of rendering either fixed sum or in any other from as may be determined by the Directors subject to the provisions of the Companies Ordinance, 1984.
- 28. The Director who resides out of station shall also be entitled to be paid such traveling and other expenses for attending the meeting for the Company as may be fixed by the Directors from time to time according to the provisions of the Companies Ordinance, 1984.
- 29. Any casual vacancy occurring on the Board of Directors shall be filled in by a resolution of the Board of Directors, and the persons so appointed shall hold office for the remainder of the term of the Directors in whose place he is appointed.

30. No director shall be disqualified from his office by contracting with the Company either as vender, purchaser or otherwise nor shall any Director be liable to account for any profit realized from any such contract or arrangement or the fiduciary relation thereby established, but the nature of his interest must be disclosed by him at the first meeting of the Directors after acquisition of his interest.

NOMINEE DIRECTOR

31. In addition to the elected Directors, the financial institutions shall be entitled, during the currency of their respective loan(s) to the Company to appoint one person on the Board of Directors of the Company to be called Nominee Director and to recall and/or replace such person from time to time. Such Nominee Director on the Board of Directors of the Company will not be the holders of share(s) in the Capital of the Company and the regulations and/or rules pertaining to the election, retirement, qualification and/or disqualification of Directors shall not apply to him.

NOTICES

32. Notices for every meeting of the Board of Directors will be given in writing and there must be given a reasonable time in advance. The nature of the business to be transacted at an intended Board meeting will be specified in the notice.

MANAGEMENT

- 33. The whole business and affairs of the Company shall, subject to the control and supervision of the Board of Directors, be managed and controlled by the Chief Executive.
- 34. Subject to the limit fixed by the Directors, the Chief Executive may from time to time raise or borrow any sums of money for and on behalf of the Company from other companies, banks or financial institutions on such terms as may be approved by the Board of Directors from time to time.
- 35. Without prejudice to the powers conferred by these Articles, the Board of Directors shall have the following powers:
 - a) To take on lease, purchase, erect or otherwise acquire for the Company any assets, stocks, lands, buildings, property, rights or privileges which the Company is authorized to acquire at such price and generally on such terms and conditions as they think fit.
 - b) To let, mortgage, sell, exchange or otherwise dispose of absolutely or conditionally all or any part of the assets, stocks, raw materials, properties, privileges and undertakings of the Company upon such terms and conditions and for such consideration as they think fit.

- c) To appoint any person or persons to be attorney or attorneys of the Company for such purposes and with such powers, authorities and discretions and for such period and subject to such conditions as they may, from time to time, think fit.
- d) To enter into, carry out, rescind or vary all financial arrangements with any bank, person, company, firm or corporation or in connection with such arrangements to deposit, pledge or hypothecate property of the company or the documents representing or relating to the same.
- e) To make and give receipts, release and discharge all moneys payable to the Company and for the claims and demands of the Company.
- f) To compound or allow time to the payment or satisfaction of any debt due to or by the Company and any claim and demands by or against the Company and to refer claims or demands by or against the Company to arbitration and observe and perform the awards.
- g) To institute, prosecute, compromise, withdraw or abandon any legal proceedings by or against the company or its affairs or otherwise concerning the affairs of the company.
- h) To raise and borrow money from time to time for the purposes of the Company, on the mortgage of its property or any part thereof and/or on any bond or debenture payable to bearer otherwise on interest and repayable in such a manner and generally upon such terms as they think fit.
- i) To open, operate and maintain bank/banks account(s) individually or jointly as the Board may authorize or to any other person on its behalf.

BORROWING POWERS

- 36. The Directors may from time to time raise, borrow or secure the payment of any sums for the purposes of the Company in such manner and upon such terms and conditions as they think fit and in particular by the issue of the debentures, debenture-stock or other securities charged upon all or any part of the property of the Company present or future.
- 37. Debentures, debenture-stock or other securities may be issued with any special privileges as to redemption, surrender, allotment of shares, attending and appointment of Directors or other privileges subject to any permission required by law.

THE SEAL

38. The Company shall have a common seal and Directors shall provide for the safe custody of the same. The seal shall not be applied on any instrument except by the authority of the Board of Directors and in the presence of at least two Directors who shall sign every instrument to which the seal shall be affixed in their presence. Such signatures shall be conclusive evidence of the fact that the seal has been properly affixed.

ACCOUNTS

- 39. The Directors shall cause to keep proper books of accounts as required under Section 230 of the Companies Ordinance, 1984.
- 40. The books of account shall be kept at the registered office of the Company or at such other place as the Director shall think fit subject to the provisions of Section 230 of the Companies Ordinance, 1984.

AUDIT

41. Once at least in every year the accounts of the Company shall be audited and correctness of the balance sheet be ascertained by one or more Auditors. The Auditors shall be appointed and their duties regulated in accordance with the provisions of section 252 to 255 of the Companies Ordinance, 1984.

INDEMNITY

42. In connection with carrying on the business of the Company, the Chief Executive, every Director, or other officer of the Company shall be indemnified by the Company for all losses and expenses occasioned by error or judgment or oversight on his part, unless the same happens through his own dishonesty or willful act and defaults.

SECRECY

43. No member shall be entitled to visit and inspect the books of the Company subject to the provisions of the companies ordinance, 1984 without the permission of the Chief Executive or one of the Directors or to require discovery of any information regarding any detail of the Company's business or any matter which is or may be in the nature of trade secret, or secret process which may relate to the conduct of the Company's business and which is in the opinion of the Directors, will not be in the interest of the members of the Company to communicate to the Public.

ARBITRATION

- 44. Whenever any difference arises between the Company on the one hand and the members, their executors, administrators or assignee on the other hand, touching the true intent or construction or the incident or consequence of these present or of the statutes or touching anything thereafter done, executed, omitted or suffered in pursuance of these presents or otherwise relating to these presents or to any statutes affecting the Company, every such difference shall be referred for the decision of the arbitrator who will be qualified in Islamic law.
- 45. The cost incidental to any such reference and award shall be at the discretion of the arbitrator or umpire respectively who may determine the amount thereof and direct the same to be shared between the attorney and client or otherwise and may award by whom and in what manner the same shall be born and paid.
- 46. In the event that a dispute, claim or controversy arises between the company, its management and its shareholders, or between the shareholders inter-se, or the directors inter-se, all steps may be taken to settle the dispute and resolve the issue through mediation by an accredited mediator before taking recourse to formal dispute resolution such as arbitration or litigation.

WINDING UP

47. If the Company is wound up whether voluntarily or otherwise the liquidator may with the sanction of a special resolution, divide among the contributories in specie any part of the assets and liabilities of the Company, subject to section 421 and other provisions of the Companies Ordinance, 1984 as may be applicable.

We, the several persons, whose names and addresses are subscribed below, are desirous of being formed into a Company, in pursuance of this Memorandum of Association, and we respectively agree to take the number of shares in the capital of the Company as set opposite to our respective names.

Name and Surname (present & former) in full (in Block Letters) and C.N.I.C.#	Father's/ Husband's Name in full	Nationality with any former Nationality	Occupation	Residential address (in Full)	Number of shares taken by each subscriber	Signatures
Ahsan Ashraf 35202-3282655-9	S/O Sheikh Muhammad Ashraf	PAKISTANI	Business Man	Jilani Centre Plot No. 1, 92- Main Ravi Road, Near Allied Bank, Lahore	50,000 FIFTY THOUSAND ONLY	
Sheikh Shahzeb Jilani C.N.I.C # 35202-7162510-5	S/O Sheikh Muhammad Jilani	PAKISTANI	Business Man	Jilani Centre Plot No. 1, 92- Main Ravi Road, Near Allied Bank, Lahore	50,000 FIFTY THOUSAND ONLY	
				TOTAL NUMBER OF SHARES TAKEN BY THE SUBSCRIBERS	100,000 ONE HUNDRED THOUSAND ONLY.	

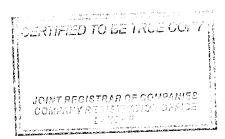
Dated this 22nd day of February, 2016.

Witness:

Witness to the above signatures:

National Institutional Facilitation Technologies (Pvt.) Ltd.

5th Floor AWT Plaza I. I. Chundrigar Road, Karachi



THE COMPANIES ORDINANCE, 1984

(COMPANY LIMITED BY SHARES)

MEMORANDUM OF ASSOCIATION

OF

JILANI ENERGY (PRIVATE) LIMITED

- I. The name of the Company is JILANI ENERGY (PRIVATE) LIMITED.
- II. The Registered Office of the Company will be situated in the Province of Punjab.
- III. The objects for which the Company is established are to do all or any of the following: -
 - 1. To design, insure, build, establish, own, operate, maintain, manage electric power generating plants for the generation through coal, natural gas, liquid natural gas, furnace oil, bio fuel, wind power, solar panels or other fuels, supply & transmission of electric power and in relation thereto, to establish, fix, carry out and maintain without limitation, any ancillary works, cables, wires, meter, lines, interconnect facilities, grid stations, transmission facilities, civil, electrical and mechanical works subject to any permission required from NEPRA or any other relevant authorities.
 - 2. To carry out a feasibility study for and to carry on the business of power generation through coal, natural gas, liquid natural gas, furnace oil, bio fuel, wind power, solar panels or other fuels and in relation thereto, to generate, accumulate, transmit, distribute and sell electric power to the public sector, including the Water and Power Development Authority, National Transmission and Dispatch Company, Government and Government bodies, and the private sector subject to any permission required from NEPRA or any other relevant authorities.
 - 3. To manufacture, purchase, import or otherwise acquire, construct, own, process, operate and maintain buildings, apparatus, fixtures, fittings, plants, machinery, materials, and things as may be necessary, incidental to or convenient in connection with power generating plant for the generation of electric power and or in connection with supply, transmission and distribution of electric power subject to any permission required from NEPRA or any other relevant authorities.
 - 4. To buy, sell, manufacture, repair, alter, improve, exchange or let out, import, export and deal in all works, plant, machinery, engines, tanks, cylinders, valves, regulators, testing equipment, tools, utensils, appliances, cookers, stoves, heaters, apparatus, products, materials, substances, raw materials, chemicals, liquid natural gas, natural gas, liquefied

petroleum gas, fuel oil, coal, lubricants, articles and things and to manufacture, experiment with, render marketable and deal in all products, incidental to or obtained in the business carried on by the Company.

- 5. To purchase, take on lease or tenancy or in exchange, hire, take options over or otherwise acquire for any estate or interest whatsoever and to hold, develop, work, cultivate, deal with and turn to account concessions, grants, decrees, licenses, privileges, claims, options, leases, property, real or personal or rights or powers of any kind which may appear to be necessary or convenient for the business of the Company but not to act as a leasing company or property developer.
- 6. To sell, exchange, mortgage, let on royalty or tribute, grant licenses, easements, options and other rights over and in any manner deal with or dispose of the Company's property or any part thereof for such consideration as may be thought fit and in particular for stocks, shares or securities of any company but in any event not to act as an investment company or leasing company.
- 7. To deal in and carry on business as importer, exporters, sellers, suppliers or otherwise dealers in all sorts of machinery, plant, apparatus, implements, spares, accessories, mill stores, foundry products, implements, accessories, engineering stores, lubricants, chemicals, raw material, yarn and other articles, goods and materials required in the mills and factories.
- 8. To carry on and undertake trading business and to act as retailers, indentors, importers, exporters, buyers, sellers traders, suppliers, manufacturers and commission agents of general item products and materials in any form or shape manufactured or supplied by any company, firm, association of persons, body, whether incorporated or not, individuals, Government, Semi-Government or any local authority.
- 9. To act as agents or representatives of foreign and local manufacturers, consultants of plants, machinery, materials or other articles for sale to any Government, local authorities, firm, companies, associations of persons or individuals and also to import and export such items (except managing agency), and any other item permissible under the law.
- 10. To establish laboratories and to employ and promote scientific research and invention, patronize such invention and enter into manufacture in collaboration with outside parties for transfer of technology from abroad and to promote transfer of technology from Pakistan abroad, and to carry on business in all other allied fields permissible by law.
- 11. To invest and deal with any surplus moneys of the Company not immediately for the time being required for any of the purposes of the Company in such investments as may be thought proper and to hold, sell or otherwise deal with such investments but in any event not to act as an investment company.
- 12. For the purposes of the business of the Company only, to advance money upon such terms as the Company may approve, and to guarantee the obligations and contracts of customers and others but not to act as a banking company.

- 13. To apply for, purchase or otherwise acquire and protect, prolong and renew whether in Pakistan or elsewhere any patents, patent rights, brevets d'invention, trademarks, design licenses, protections, concessions and the like conferring any exclusive or non-exclusive or limited right to use any secret or other information as to any invention, process or privilege which may seem capable of being used for any of the purposes of the Company or the acquisition of which may seem calculated directly or indirectly to benefit the Company and to use, exercise, develop, manufacture under grant, licenses, privileges in respect of, or otherwise turn to account the property, rights and information so acquired and to carry on any business in any way connected therewith.
- 14. To get insured against losses, damages, risks, accidents and liabilities of all kinds which may affect the company whether in respect of its contracts, agreements, advances or securities or in respect of servants or employees or directors of the company, or in respect of property belonging to or leased to or hired by the company, either by setting apart funds of the company or by effecting such insurance and in later case to pay the premium thereon.
- 15. To train personnel and workers, in Pakistan and for abroad, to obtain technical proficiency in various specialties connected with the business of the Company.
- 16. To undertake and execute any project the undertaking whereof may seem desirable, and either gratuitously or otherwise.
- 17. To procure the Company to be registered or recognized in any foreign country or place.
- 18. To acquire and undertake all or any part of the business, property, goodwill and liabilities of any person or company carrying on any business which the Company is authorized to carry on or possessed of property suitable for the purposes of the Company.
- 19. To adopt such means of making known the business and/or services of the Company as may seem expedient and in particular by advertising in the press, or in the other media or by way of participation in exhibitions.
- 20. For the purposes of the Company, to purchase, manage, acquire by lease, mortgage, dispose of, sell, exchange, turn to account any part of the property and rights of the Company.
- 21. To employ or appoint any persons, experts, consultants, advisers, contractors (including O&M contractors), brokers in connection with the business of the Company.
- 22. To pay for any property or rights acquired by the Company, either in cash or fully paid shares or by the issue of securities, or partly in one mode and partly in another and generally on such terms as may be determined.

- 23. In connection with the business of the Company only, to give guarantees and indemnities for the payment of money or the performance of contracts or obligations by this Company but in any event not to act as an investment banking or finance company.
- 24. In connection with the business of the Company only, to borrow and where required, to secure the payment of money in such manner as the Company shall think fit and in particular by the creation of mortgages and charges over the (present and future) property, assets and/or undertaking of the Company and/or by issue of debentures, participation term certificates, term finance certificates and other securities charged upon all or any of the Company's property both present and future, and to purchase, redeem and pay off any such securities.
- 25. To take, or otherwise acquire, and hold shares in any other company having objects altogether or in part similar to those of this Company or carrying on any business capable of being conducted so as directly or indirectly to benefit this Company but in any event not to act as an investment company.
- 26. To enter into partnership or into any agreement or agreements for sharing profits, union of interests, cooperation, joint venture, reciprocal concession and/ or facilities with any person or company whether or not having objects similar to those of this Company but in any event not to act as managing agents.
- 27. To enter into any agreement or agreements with any government or other authority, supreme, municipal, local or otherwise, that may seem conducive to all or any of the objects of the Company and/or to obtain from such government or authority including the State Bank of Pakistan or National Electric Power Regulatory Authority (NEPRA) any rights, concessions or privileges, licenses which the Company may think desirable to obtain and to carry out, exercise and comply with any such arrangements, rights, privileges, concessions and licenses.
- 28. To pay all or any costs charges and expenses preliminary and incidental to the promotion, formation, establishment and registration of the Company and to pay any development costs incurred (whether before or after the incorporation of the Company) by the sponsors of the Company in connection with any project of the Company.
- 29. To guarantee the performance of contract and obligation of any associated/holding/subsidiary/sister concern company only and to give any guarantee in relation to the payment of any loan, debenture, debenture-stock, bonds, obligations and securities issued by or in favor of such an associated/holding/subsidiary/sister concern /company and in this respect create mortgage/ or charge over whole or any part of the properties, assets and stocks of the Company, both present & future, fixed and current or by special assignment or to transfer or convey the same absolutely or in trust may seems expedient and to purchase, redeem or pay of any such securities.
- 30. To invest and deal with surplus money or funds of the company in any bank, financial institutions, public or private companies or associated undertakings at arm's length basis and in such manner as may deem appropriate from time to time by the company.

- 31. To pay brokerage or commission to any person or persons in consideration of his/their subscribing, or agreeing to subscribe, whether absolutely or conditionally, for any shares or debentures of the Company, or for procuring or agreeing to procure subscriptions whether absolute or conditional for the same which brokerage or commission may be paid either in cash or shares of the Company, credited as fully paid up.
- 32. To distribute any of the Company's property among the members in specie in the event of winding up of the Company.
- 33. To amalgamate, consolidate, or merge, either in whole or in part, with or into any other companies, associations, firms or persons carrying on any trade or business of a similar nature to that which this Company is authorized to carry on.
- 34. To do all or any of the things herein in any part of the world either as principals, agents, contractors or otherwise, and either alone or in conjunction with others but in any event not to act as managing agents.
- 35. To provide engineering, construction, consultancy and design services and radio and other communication systems and services, and any facilities, equipment and installations whether related to such services and systems or otherwise.
- 36. To carry on any other business whether manufacturing or otherwise that may seem to the Company capable of being conveniently carried on in connection with the above objects or calculated directly or indirectly to enhance the value of or render profitable any of the Company's property or rights or which it may be advisable to undertake with a view to improving, developing, rendering or furnishing to account any property real or personal belonging to the Company or in which the Company may be interested and to do all or any of the above things either as principals, agents, contractors or otherwise, and either alone or in conjunction with others and either by or through agents, sub-contractors, trustees or otherwise, and to do all such things as are incidental or conducive to the attainment of the above objects but in any event not to act as managing agents.
- 37. To do all and everything necessary, suitable or proper or incidental or conducive to the accomplishment of any of the purposes or the attainment of any of the objects or the furtherance of any of the powers hereinbefore set forth, either alone or in association with other corporate bodies, firms or individuals or with any Government authority or public or quasi-public authority or any other authority, and to do every other act or thing incidental or appertinent to or arising out of or connected with the business or powers of the Company or part thereof, provided the same be lawful.
- 38. It is declared that notwithstanding anything contained in the foregoing object clauses of this Memorandum of Association nothing contained therein shall be construed as empowering the Company to undertake or to indulge in business of banking company, banking, leasing, investment, managing agency or insurance business directly or indirectly as restricted under the law or any unlawful operation.

- 39. It is further declared that notwithstanding anything stated in any object clause, the Company shall obtain such other approval or license from the competent authority, as may be required under any law for the time being in force, to undertake a particular business.
- IV. The liability of the Members is limited.
- V. The authorized capital of the Company is Rs.500,000,000 (Rupees five hundred million) divided into 5,000,000 shares of Rs.100 each, with power of the Company, specifically, to increase the authorized share capital to include a further issue including of preference shares and generally, to increase or reduce the capital and to divide the shares in the capital for the time being into several classes in accordance with the provisions of the Companies Ordinance, 1984 and any rules made there under, and to attach thereto respectively such preferential, deferred, qualified or special rights, privileges or conditions as may be determined by or in accordance with the Articles of Association of the Company for the time being, and to vary, modify or abrogate any such rights, privileges or conditions in such manners as may for the time being provided by the Articles of Association of the Company in accordance with Law.

We, the several persons, whose names and addresses are subscribed below, are desirous of being formed into a Company, in pursuance of this Memorandum of Association, and we respectively agree to take the number of shares in the capital of the Company as set opposite to our respective names.

Name and Surname (present & former) in full (in Block Letters) and C.N.I.C.#	Father's/ Husband's Name in full	Nationality with any former Nationality	Occupation	Residential address (in Full)	Number of shares taken by each subscriber	Signatures
Ahsan Ashraf 35202-3282655-9	S/O Sheikh Muhammad Ashraf	PAKISTANI	Business Man	Jilani Centre Plot No. 1, 92- Main Ravi Road, Near Allied Bank, Lahore	50,000 FIFTY THOUSAND ONLY	
Sheikh Shahzeb Jilani C.N.I.C # 35202-7162510-5	S/O Sheikh Muhammad Jilani	PAKISTANI	Business Man	Jilani Centre Plot No. 1, 92- Main Ravi Road, Near Allied Bank, Lahore	50,000 FIFTY THOUSAND ONLY	
			A.	TOTAL NUMBER OF SHARES TAKEN BY THE SUBSCRIBERS	100,000 ONE HUNDRED THOUSAND ONLY.	

Dated this 22nd day of February, 2016.

Witness:

Witness to the above signatures:

National Institutional Facilitation Technologies (Pvt.) Ltd.

5th Floor AWT Plaza I. I. Chundrigar Road, Karachi

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FEASIBILITY STUDY REPORT

<u>OF</u>

6.5 MW COAL FIRED POWER PROJECT

JILANI ENERGY (PVT.) LTD.

17 Km Sheikhupura Road, Sowa Messon Kaller, Lahore

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1. PLANT CHARACTERISTICS

1.1 Project Introduction

Electrical Power is essential for running machinery in factories and industrial units. There has been an enormous increase in the demand of Electrical energy in the last two decades due to industrial development, but sadly, there has been no significant increase in energy production. Therefore, supply of energy is far less than the actual demand; consequently, a huge energy crisis is looming over Pakistan.

Keeping in view the severe energy crisis, Jilani Group has decided to set-up a Coal based power project which will be sufficient enough to fulfill the energy requirements of the Jilani Group Companies and may distribute the extra energy to nearby bulk users as well. Coal based Power is economical and viable option in comparison to other sources like fuel based which are more expensive.

The project cost of Jilani Energy (Pvt) Ltd., is envisioned as Rs. 413.7 Million, fully owned by Directors / Sponsors of the company.

Jilani Energy (Pvt) Ltd., is an associated company of Jilani Group, projected to be a 6.5MW coal-fired power plant to provide power to processing units, and to meet the energy requirement of production. The proposed power plant is located near the processing units, with main configuration of 1 x 6.5MW condensing type turbine equipped with 1 x 6.5 MW brushless excitation generator, and 1 x 35 t/h CFB boiler, with high temperature (470°C) and sub-high pressure (6.6MPa) parameter. Annual operation hours are set as >8000 hours. Outgoing feeder voltage of generator is 11 kV which is synchronized to the grid of processing plant. Supply power is 6.5MW. The power plant adopts Pakistan local coal or Imported coal (which one is more economical) as fuel.

1.2 Project Location and Accessibility

The project is located at Lahore-Sheikupura road near Jilani Plastic. The google map of the project area shows the exact location:



The Coordinates of the area are: 31.647534, 74.185070

The location is accessible from Islamabad through Islamabad Motorway (M2). The distances are:

Islamabad Motorway to Kot Abdul Malik Motorway Exchange	332 km
Kot Abdul Malik Toll to Jilani Energy	7.4 km

1.3 Design Scale and Scope

Design Scale

Design capacity of the power plant is 6.5MW, with 1 set of 35 t/h high temperature, high pressure CFB boiler, 1 set of 6.5MW condensing steam turbine equipped with 1 set of 6.5MW brushless excitation generator.

Design Scope

- Boiler System
- Turbine System
- Generator System
- Fuel Conveying System
- Limestone Injection into the Boiler
- Ash & Slag Handling System
- Chemical Water Treatment System
- Water Supply & Drainage System of Power Plant
- Firefighting System of Power Plant
- Electrical System
- Control & Instrumentation System
- Ventilation and Air Conditioning System
- Other Civil Works Matched with The Above System

1.4 Introduction to Plant Address

Natural Conditions of Plant Area

The proposed power plant is located near the Jilani group's Processing plants, with convenient transportation and smooth landform. The power plant takes approx. 2 - Acers as shown in fig 01.

Water Source of Power Plant

Underground water is adopted as process water, which is provided by the processing plant via digging deep wells. Tap water is adopted as domestic water, which is provided by the processing plant.

Fuel Supply

Fuel source of power plant is local/imported coal of Pakistan with annual consumption of approx. 32,000 tons. Coal is transported to dry coal shed by trucks.

Desulfurizer Supply

Fuel source of power plant is local/imported coal of Pakistan with annual consumption of approx. 32,000 tons. Coal is transported to dry coal shed by trucks.

General Layout of Power Plant

General layout of power plant shall be designed according to the construction scale of 1 boiler and 1 STG.

From west to east, the whole power plant is successively arranged with water treatment area, circulating cooling water area; main power building, coal conveying trestle, coal crusher house, coal storage area, ash & slag discharging area.

1.5 Power Supply Load

Outgoing feeder voltage level of the generator is 11 kV, which is synchronized to the grid of Jilani poly and plastic processing plant. After put into operation, it can supply 6.5 MW (deducting the auxiliary load) electricity to the grid of processing plant.

1.6 Main Design Principle

1 set of High temperature and high pressure 35 TPH CFB boiler is set for this project during this phase, together with 1 set of 6.5MW extraction condensing STG unit. Turbine is manufactured by Peter brotherhood (Rated power is 6.5 MW. Main steam inlet pressure is 6.6 MPa. Main steam inlet temperature is 470°C); Generator is supplied in matching model, Rated power is 6.5MW. Outgoing feeder voltage level is 11 kV. 1 set of CFB (circulating fluidization bed) boilers model has Rated capacity is 35 TPH. Steam pressure is 6.6 MPa. Steam temperature is 470°C.) Semi open layout is adopted.

Fuel Conveying System

The power plant is equipped with a set of dry coal shed with span of 30 m, and length of 60 m. Total area of dry coal shed is 1800 m2, which can store up to 1000 tons, meeting 10-day coal demand of the power plant .Coal in dry coal shed is transported to coal belt conveyor by coal feeder below underground coal hopper and then sent back to raw coal bunker of main power building by belt conveyor after crushing. Single loop belt conveyor with belt width of 650 mm shall be used to transport coal of 4 Tons/hr to boiler.

In accordance with the requirements of environmental protection, multicyclones is used for flue gas dust removal, whose dust removal efficiency is 85%. Internal limestone desulfurization system is adopted for the boiler. When calcium sulfur molar ratio is 2.5, the desulfurization efficiency can reach 85%.

Ash & Slag Disposal System

Ash and slag of boiler is utilized completely and comprehensively as raw material for brick and tile plant. Total annual ash & slag discharge of power plant is about 4800 tons.

Boiler slag is discharged to cooling slag remover and cooled dry slag is transferred to slag silo through large-inclination belt conveyor, then transported to cement plant or brick & tile plant by vehicles for comprehensive utilization.

Chemical Water Treatment System

Makeup water of boiler is handled by 2-pass RO plus demineralization plant according to main equipment type, parameter and makeup water quality requirements.

Circulating Cooling Water System

Open cycle circulating system of GRP mechanical draft cooling tower is used for circulating cooling water system.

Main Electrical Wiring System

1 set of 6.5 MW generator is set for power plant during this phase. Outgoing feeder voltage level is 11 KV. A section of 11 kV bus is set in this main power building and generator is directly connected to the bus via the switch. Bus adopts single-bus wiring scheme .11 KV bus provides power to Jilani Poly and Plastic Industry, connected to substation via an 11 KV tie-in line.

■ Thermodynamic System

Main steam system adopts unit system scheme. Live steam from boiler outlet is respectively connected to motorized isolation valve and then to main stop valve of turbine, finally to speed governing valve and drive the turbine to work.

Combustion System

Raw coal is sent from raw coal bunker into boiler for combustion by coal supply air and sowing air by 3 sets of coal feeders. Heated flue gas ignition is used by oil gun under CFB for boiler ignition. Combustion air is divided into primary air and secondary air for segmented air supply. Flue gas enters into cyclone separator from furnace outlet and that after separation by cyclone separator enters into back-pass duct of boiler. It will be pressurized by ID fan after de-dusted by bag filter. Most of materials will be separated from cyclone separator during boiler operation. They will be sent back to combustion house by loop seal air. De-sulfurization system adopts limestone powder de-sulfurization system inside furnace.

Layout of Main Power Building

Main power building has 4 column spaces with 1 space of 7.5m and 4 spaces of 6m. Total length is 31.5 m. Main power building is set in 3 columns, i.e. turbine house, deaeration coal bunker room and boiler house, with span of 18m, 9.5m and 23 m respectively.

Thermal Automation Plant

Industrial computer, LED large-screen display and a special key are used as main measures for indoor control process system of thermal automation control room so as to control operation process of the entire power plant. DCS control system of this project proposes to consist of data acquisition system (DAS), analog quantity control system (MCS), sequence control system (SCS) and electrical control system (ECS). Thermal automation control room is set on operating floor of deaeration coal bunker 7m deck.

1.7 Energy Conservation and Raw Material

After put into operation, the power plant can supply 6.5 x 8400 kWh power annually. Coal consumption for power generation is 622 gm/KWh, (based on client's supplied SGS coal analysis report, the GCV of coal is 5500 Kcal/kg, NCV of Pakistan local coal is 3500 Kcal/kg coal.

CFB boiler has high combustion efficiency (89%) and large load regulation scope. It still can burn stably without oil injection which can support combustion so as to save oil under 40% of low load. Limestone powder is added as desulfurization agent during operation of CFB boiler.

Due to the combustion conditions of low-temperature and segmented air supply in this furnace, the NOx generation is remarkably decreased.

Station auxiliary transformer of low losses is selected for this project to save energy consumption. Sufficient high-precision surveying instruments is furnished for electrical and steam-water systems according to regulations. Operation indicators is surveyed and checked reasonably to control economic operation of power plant effectively.

Recycle and circulate drainage of industrial cooling water of main power building to save water consumption.

1.8 Environmental Protection

Influence of power plant to surrounding environment is introduced as followings after project

Construction:

As internal desulfurization system is adopted, comprehensive de-sulfurization efficiency can reach 85%, and SO2 at stack outlet is < 400 mg/Nm3.

As low-temperature combustion is adopted (850° C~ 900° C), NOx content is largely decreased to 300 mg/Nm3.

Open cycle circulating cooling system is used for power plant without external drainage or thermal pollution. Industrial wastewater and living sewage of power plant shall be drained after treatment without environment pollution.

Plant tone is far away from resident's concentrated zone.

The project adopts wet ash removing method, with hydraulic ash removing system properly arranged, which has little effect on environment, and can make comprehensive utilization of ash and slag.

1.9 Labor Safety and Industrial Sanitation

According to relevant regulations and standard, take feasible and effective measures to avoid fire, explosion, lightning stroke, chemical damage, mechanical damage or noise, improve operation conditions and guarantee health of operators.

1.10 Operation Organization and Design of Fixed Manpower

Organization

Organization of power plant is managed by three levels, namely, plant, workshop and shift. Plant consists of office, Production Technology Office, Financial Department and Administration Office. Production workshop consists of operation workshop, repair workshop and fuel workshop.

Design of Fixed Person

There are 78 fixed workers (namely, operators, overhaul, management personnel and other persons) in this plant.

2. GENERAL LAYOUT AND TRANSPORTATION

2.1 Layout Principal

Power plant is located near processing plants. General layout principle is to set various production workshops, buildings, structures and equipment according to existing position and area and production processes of the power plant to aim at reasonable and beautiful layout and meet safe, stable and continuous production requirements of the power plant and gap between various production workshops, buildings and structures shall meet relevant current Chinese design specifications.

2.2 General Layout

Total layout of power plant shall be arranged and designed according to 1 set of boiler and 1 set of steam turbo-generator. From west to east, the whole power plant is successively arranged with water treatment area, circulating cooling water area; main power building, coal conveying trestle, coal crusher house, coal storage area, ash & slag discharging area.

2.3 Traffic and Transportation in the Plant

Roads in the plant are basically circular and every functional zone is circled by roads and width of main roads in the plant is 6m and that of secondary roads is 4m. Width of roads in functional zone and approach roads shall be 2m and bending radius shall be 6m and 4m respectively according to demand with and concrete structure for road surface structure. "Three connections and one leveling" must be ensured that a construction site is connected to water and electric power supplies and roads, and that the ground is leveled before the project kick-starts and site elevation and slope should be decided according to the general drawings and traffic transportation requirements before construction in the plant.

2.4 Vertical Layout of the Plant Area

Ground elevation inside the plant should be settled based on the following principles is: for one thing, it cannot submerge the plant area at highest level of tidewater, for another thing, ground water and drain pipe water can be discharged easily, and try to maintain the field at same level. Therefore, earthwork balance should be done before construction.

3. THERMAL MECHANICAL PART

3.1 Main Design Principle

The project is arranged with 1 set of Peter Brotherhood condensing steam turbine, equipped with 1 set of Peter brotherhood generator (Rated power is 6.5 MW); and 1 set of 35 t/h CFB boiler.

3.2 Specification of Main Equipment:

Boiler

Rated output	35 TPH
Design thermal efficiency	89%
Main steam temperature	470°C
Main steam pressure	6.6 MPa
Feed water temperature	1k05°C
Design Coal	Local coal
Coal consumption at BMCR	4043 Kg/h
flue gas exhaust temperature	155°C
Boiler blow down rate	2%

Turbine

Rated power	6.5 MW
Rated rotation speed	8250 RPM
Rotation direction	Clockwise direction
Steam inlet pressure	6.6 MPa
Steam inlet temperature	470°C
Rated steam volume	4.2 Kg/KWh
Rated heat rate	8483 KJ/KWh
Circulating cooling water inlet temperature	33°C
Rated steam exhaust pressure	0.08 bara
Unit vibration value	< 0.03mm
Noise (measured in distance which is Im away from cover shell)	< 85db(A)
Regulation mode	DEH (Digital Electrohydraulic)

Generator

Rated power	6.5MW
Rated voltage	11 KV
Rated rotation speed	1500 RPM
Rated frequency	50Hz
Power factor	0.8
Excitation mode	AC brushless excitation
Efficiency	97%
Cooling mode	air-cooled
Rotation direction	Clockwise direction
Insulation level (of stator or rotor)	F
Overload ability	10%

Design Scope

Design of turbine, boiler, piping system inside main power building, and selection & arrangement of equipment. Maintenance and auxiliary equipment associated with turbine, generator and boiler.

3.3 Fuel

Fuel Source

The project adopts Pakistan local/imported coal. Coal is transported to dry coal shed by trucks.

■ Fuel Analysis Data

Pakistan local coal analysis

Net calorific value	3500 Kcal/Kg
Volatile matter	40.36%
Total Moisture	15.49%
Ash content	22.55%
Fixed Carbon	33.11%
Hydrogen	4.29%
Oxygen	13 .70%
Nitrogen	1.73%
Sulfur	8.03%

Ignition Fuel

Ignition system of boiler adopts light diesel or natural gas. Light diesel is locally supplied, which is transported to power plant by tank car. Natural gas is locally supplied which is transported to power plant by piping.

3.4 Combustion System

Coal Consumption of Boiler

Calculation principle of coal consumption of boiler is as followings:

Annual operation time of boiler	8400 Hrs
Average daily operation hours of boiler	24 Hrs
Combustion efficiency of boiler	89%
Continuous blow-down rate of boiler	2%
Net calorific value of coal	3500
Hourly coal consumption	4.043 TPH
Daily coal consumption	97 Tons/day
Annual coal consumption	34000 Tons/Year

Combustion System

Raw Coal is sent from raw coal bunker to furnace for combustion by coal supply air and sowing air by 3 stokehold coal feeders. Hot flue gas ignition is used by oil gun under CFB for boiler ignition. Combustion air is divided into primary air and secondary air for segmented air supply. Primary air is sent to furnace through distribution air plate in air chamber after preheating and it accounts for about 50%, and after secondary heating, it will be sent into furnace through front and rear furnace wall, which also accounts for 50%.

Flue gas enters into cyclone separation in furnace outlet and that separated by cyclone separator enters into horizontal flue duct on the top of furnace and tail shaft flue duct. It is sent to stack by ID fan after dust collection by venturi scrubber to atmospheric emission. Most of materials will be separated from cyclone separator during boiler operation. They will be sent to combustion room by loop seal air. Desulfurization adopts limestone powder desulfurization system inside furnace as shown in fig 05.

There are 02 raw coal bunker of collective capacity of 75 Tons for operation of boiler for 24 hours.

3.5 Thermodynamic System

For the power plant, 1 boiler and 1 STG set and main part of steam & water system adopts unit system scheme.

Main Steam System

Main steam system adopts unit system scheme. Live steam from boiler outlet is respectively connected to motorized isolation valve and then to main stop valve of turbine, finally to speed governing valve and drive the turbine to work.

Demin Water System

After entering into demin water pipe in main power building, part of the demin water is sent to slag cooler & discharger for slag cooling, and then is sent to turbine condenser respectively together with the other part of demin water, as make up water of the boiler.

Condensate System

Condensate of turbine is sent to condensate pipe after pressurization by condensate pump and heating by steam sealing heater. Condensate system also provides de-superheated water for gland seal PRDS, and sealing water for water sealing valve.

Boiler feed water system

Boiler feed water system is fitted with 2 boiler feed water pumps. Feed water system is equipped with 2 motorized feed water pumps.1 in operation and 1 standby.

Vacuum System of Condenser

Vacuum system of condenser consists of, water jet air ejector, water ejection tank, pipeline and valve. Steam and air mixture of uncondensed water in condenser is pumped by water jet air ejector to maintain vacuum in condenser.

Industrial Water System

Open cycle system is used for industrial cooling water without industrial water tank. Industrial cooling water system is to provide cooling water for primary fan, secondary fan, ID fan, motorized feed water pump and steam-water sampling cooler, etc. In order to save water, 1 set of Boiler house is arranged

with 10m3 low elevation water tank and 2 sets of low elevation water pump, with 1 set in operation and 1 set standby.

3.6 Layout of Main Power Building

General

Main power building has column space of 6m and 7.5m, with configuration of 1 boiler and 1 STG unit. Main power building has 5 column spaces, with total length of 31.5m (in which the length of boiler house is 25.5m).

Main power building is set in 3 rows. From south to north, turbine house, deaeration coal bunker house, boiler house, bag filter, ID fan, desulfurization tower and stack are set in outer side of boiler house in sequence.

Turbine house

Span of turbine house is 16m. Column space is 7.5m and 6m, and there are totally 4 column spaces and total length is 24 m. Turbine is set longitudinally and machine head faces toward fixed end. Central line of STG set is 8m away from that of Row A of columns.

Motorized feed water pump is set near B row of column on bottom level of turbine house with 1

Longitudinal operation maintenance & repair access way. Heater platform is set at the turbine head side with gland sealing heater, LP heater, HP heater, oil tank, etc. on it. Stairs are connected to bottom level of turbine house and 7m operating floor. Elevation of heater platform is 3.4m. Hoisting holes are reserved on generator end. Bottom level is maintenance site. 1 overhead crane of 20/5t is set in consideration of installation, repair & positioning demand of STG set and heater. Rail top elevation is 14m. Lower chord of turbine house rack is 16.5m. Elevation of operating floor is 7 m.

De-aeration Coal Bunker House

Span of de-aeration coal bunker house is 9.5m. Column space is 7.5m and 6m. There are totally 5 column spaces in 5-level arrangement and total length is 31.5m. Plant power distribution room is on the bottom floor. Steam & water pipeline and cable levels are on 4m level. Elevation of operating floor is 7m. Elevation of de-aerator level is 13m. Elevation of coal conveying belt level is 25m. 7m operating floor is arranged with centralized control room of

turbine, boiler and electrical system and main steam headers. Raw coal bunker is arranged below 25m floor, and staircase is set at fixed end.

Boiler House

Boiler adopts semi-open arrangement, with span of 23m, column space of 7.5m and 6m. There are totally 4 column spaces in 2-level arrangement and total length is 25.5m. PA fan, SA fan are set on bottom floor. Utility equipment nt such as drainage tank, drainage pump, low elevation water tank and low elevation water pump, etc. are set near fixed end. Elevation of boiler operation floor is 7. Steam-water sampling and dosing room is set at fixed end. ESP is set in outer side of boiler house.

ID Fan

ID fan and venturi scrubber are set in open area. Stack has a height of 30m and outlet diameter of 2 m, of concrete structure.

Protection Measures of Open Layout of Equipment

- A small enclosed chamber is set on the top of boiler. Chamber is fitted with accessories and instruments in boiler drum side, to prevent frost damage.
- Take thermal insulation measures for pipeline, equipment, valve and accessories in chamber on the top of furnace to reduce radiation losses and avoid super-high temperature of chamber.
- Take protection measures accordingly, to prevent frost damage to pipeline, valve, and fittings in open air, and prevent leakage of rain.
- ID fan is protected by thermal insulation and outer galvanized iron sheets. Use an outdoor
- Electromotor.
- In winter, emergency shutdown period is quite long, so water in the boiler shall be totally discharged. Drying method shall be taken if necessary.
- for maintenance in winter, after hydro testing, ignites the boiler immediately; if not, discharge the water inside boiler completely; if water is not totally discharged, then take drying method.

Maintenance & Hoisting Facilities

1 turbine house is fitted with a motorized double-beam double-hook overhead traveling crane of 20/5t for unit maintenance. Auto crane is used for maintenance of ID fan.

3.7 Auxiliary Facility

Boiler ignition oil system Boiler ignition adopts light diesel oil or natural gas. Light diesel system is equipped with 2 sets of ignition oil pumps (1 working and 1 standby) for startup ignition of boiler. 2 sets of ignition pumps are arranged inside fuel oil pump house.

Air Compressor Station

An air compressor station is built in this power plant. It is fitted with 2 screw type air compressors with parameters of 3 m3/min and 0.8MPa. 1 unit is in operation and 1 standby. Air compressor station provides compressed air for operation of limestone desulfurization system, dust collection and ash & slag removal system. It also provides compressed air for boiler and turbine maintenance.

3.8 Thermal Insulation of Pipes and Facilities

Main thermal insulation materials of steam-water pipes and auxiliaries whose temperature exceeds 350 °C shall be made of aluminum silicate fiber.

Properties of aluminum silicate fiber products are as follows:

Thermal conductivity:	X = 0.072W/m.k (500q)
Bulk density	<160 kg/m³
The maximum usage temperature	350

Adopt galvanized steel plates of 0.5mm for protective layer.

- Painting of pipes and equipment's
- Painting of non-thermal insulation pipes and equipment's
- In general, it is required to brush two layers of anti-corrosion paint then brush ready-mixed paint once for pipes and equipment's.
- In general, it is required to brush anti-corrosion paint once then brush asphalt paint twice for directly buried pipes or those in the trench.
- Painting of pipes and equipment's with thermal insulation

- Brush anti-corrosion paint on metallic surface of pipes and equipment's for two layers when medium temperature is no more than 120 °C.
- In general, there is no need to brush anti-corrosion paint on the metallic surface of pipes and equipment's when medium temperature exceeds 120 °C.
- In general, it is required to brush anti-corrosion paint on supports and hangers which are
- Manufactured on the site twice then brush ready-mixed paint which matches color of supports and hangers supplied by the factory once.
- Brush paint with same or coordinated color once if paint is damaged or color is inconsistent for equipment's, supports and hangers which are supplied by the factory.
- In general, it is required to brush anti-corrosion paint twice for platform ladder then brush the ready mixed paint once and color of readymixed paint shall be the same to that of platform of boiler body or building structure.

Internal de-sulfurization by limestone powder injection limestone

- Limestone conveyor cyclone
- Dust remover Auxiliary fan
- Limestone bunker
- Elevator conveyor Elevator
- Finished product
- Coarse powder
- Main fan
- Unloading hopper
- Column mill
- Measuring conveyor
- Finished product bunker

Due to high sulfur content (5%-6%) of Pakistan local coal, so CFB boiler is selected. CFB boiler adopts internal desulfurization system by limestone powder injection. CFB boiler has the following characteristics rather than conventional coal-fired boilers (like pulverized coal fired boiler and stoker fired boiler): low combustion temperature (850°C~ 900°C); long dwelling time of fuel; strong turbulent mixing in combustion chamber. Based on these features, if limestone powder is directly put into the furnace during combustion process, due to the combustion temperature from 850 H — 900 H is the best reaction temperature range for desulfurization between quick lime (CaO) and SO2, therefore, according to the sulfur content in coal, put proper amount of limestone powder (equivalent ratio of calcium and sulfur being 2.5) into the CFB boiler furnace, and the desulfurization efficiency of 85% can be achieved.

Therefore, CFB boiler is economical, efficient, and environmental protection.

The technological process of de-sulfurization by dosing limestone powder to furnace system: limestone preparation system —> limestone powder conveying pipe —> limestone powder silo —> compressed air —> interlock continuous pump -motorized feeder ---> limestone powder conveying pipe —> boiler furnace.

Limestone Composition Analysis Table

SiO ₂	% 1.2-2.1
Al ₂ O ₃	% 0.15-0.33
Fe ₂ O ₃	% 0.37-0.62
CaO	% 53-54
MgO	% 1.52-1.72
Loss on ignition	% 40.4
Particle size	<1mm
Hourly Limestone consumption	1 t/h
Daily limestone consumption	24 t/h
Annual limestone consumption	8400 t/h

Waste Water Analysis Report

PH	11.39
Temperature	45 °C
BOD	580 mg/lit
COD	1,146 mg/lit
TSS	412 mg/lit
IDS	4,148 mg/lit
Chromium	mg/lit ND
Copper	mg/lit ND
Oil & grease 54 mg/lit	54 mg/lit

Technical index of de-sulfurization system

- Guaranteed de-sulfurization efficiency>94 %
- Operational flexibility 50~110%
- Outlet SO2 concentration <400 mg/Nm3
- Flue gas discharge temperature >155°C
- Pressure drop of flue gas through de-sulfurization system <1200Pa
- Lime consumption of de-sulfurization system<1 Ton

Technical process flow and process flow characteristics

- Main economics & technical index

FGD inlet gas temperature	155°C
De-sulfurization efficiency	94%
De-sulfurization system pressure drop	<1200Pa
Annual operation hours	8400 Hrs
Emission concentration of inlet SO ₂	<400mg/Nm3

4. ASH AND SLAG REMOVAL SYSTEM

4.1 Slag Quantity of Power Plant

Boiler Ash volume	0.5 m ³ /h
FGD inlet gas temperature	155°C
De-sulfurization efficiency	94%
De-sulfurization system pressure drop	<1200Pa
Annual operation hours	8400 Hrs
Emission concentration of inlet	SO ₂ <400mg/Nm ³

4.2 Ash Removal System

Positive-pressure dense phase silo pump conveying system is used for ash removal system. The project is arranged with 1 set of bag filter, and a set of air compressor station with 2 x1.0m3 air compressor installed inside, with 1 in operation and 1 standby. 6 ash hoppers are arranged below each bag filter.

k1.0 m3 dense phase pneumatic delivery pump is installed below each ash hopper. Ash inside silo pump is in suspension form.

Under the effect of compressed air, dry ash is delivered into ash silo through delivery pipe.

Ash inside dry ash silo is transported outside after discharged by ash unloading device, for comprehensive utilization of cement plant or brick & tile plant. Ash inside dry ash silo can be discharged directly, or humidified into wet ash to be discharged. Power plant is arranged with a set of 400m3 ash bunker, which can store 18-day ash discharging quantity of the system.

Process flow of ash removal system is as followings:

Ash hopper of bag filter \rightarrow diverter damper \rightarrow silo pump \rightarrow ash silo \rightarrow double-shaft blender \rightarrow transported away

4.3 Slag Removal System

Boiler slag is discharged into cooling slag discharger and cooled dry slag is transferred to slag silo through large-inclination slope-protected belt conveyor and transported away.

Volume of slag silo is 100m3 to store 2-day slag discharging quantity of the system.

6.5 MW COAL FIRED POWER PLANT

Process flow of slag removal system is as followings:

Boiler slag discharging pipe \Rightarrow diverter damper \Rightarrow slag cooler & discharger \Rightarrow large-inclination slope-protected belt conveyor silo \Rightarrow slag silo \Rightarrow bulk machine \Rightarrow transported away.

5. CHEMICAL WATER TREATMENT SYSTEM

5.1 Introduction

The power plant is equipped with 1 set of 35 t/h CFB boiler, and 1 set of 6.5 MW extraction condensing STG unit, with high temperature (470°C) and high pressure (6.6 MPa) parameter. Max. steam supply volume is 35 TPH. Boiler make up water is supplied by water treatment workshop. Based on water analysis report, water treatment system for boiler make up water is set as Pass 1 2 section RO plus mixed bed demin system. Water quality is as following:

PH	7.61
Conductivity	7311 μs/m
TDS	1014mg/l
Total hardness (CaCO³)	163.2mg/l
Са	27.7mg/l
Mg	22.89mg/l
Ca hardness (Ca)	69.36mg/1
Mg hardness(Mg)	93.84mg/1
Alkalinity (CaCO3)	470.25mg/l
Oxygen	≤7 μg/L
Fe	≤30 µg/L
Cu	≤5 μg/L

5.2 Boiler Feed Water Treatment System

Makeup water treatment system of boiler adopts Pass 1 2-section RO device plus mixed bed system, with demin rate of > 97%. Demin water recycle rate of 2-Pass RO device is 75%.

System process is as followings:

Raw water tank \rightarrow clean water pump \rightarrow active carbon filter \rightarrow multi-media filter \rightarrow security guard filter of 5µm \rightarrow HP pump \rightarrow (Pass 1 2-section) RO device \rightarrow carbon remover \rightarrow intermediate water tank \rightarrow intermediate water pump \rightarrow mixed bed \rightarrow demin water tank \rightarrow demin water pump \rightarrow de-aerator

Demin water quality is as follows after system treatment:

Hardness	0 mg/Ltr
Silica	<0.02 mg/Ltr
Conductivity	<0.2 µS/cm

The demin system adopts parallel header scheme, operated by manual valves. Chemical meters measurement of system, and parameters such as flow and liquid level etc are monitored in control room.

5.3 Make up Water Treatment System of Circulating Cooling Water

Makeup water treatment system of circulating cooling water adopts Pass 1 2-section RO device plus mixed bed system, with demin rate of > 90%. Demin water recycle rate of Pass 1 2-section RO device is 90%.

System process is as follows:

Raw water tank \rightarrow clean water pump \rightarrow active carbon filter \rightarrow multi-media filter \rightarrow cartridge filter of Sum \rightarrow HP pump \rightarrow (Pass 1 2-section) RO device \rightarrow carbon remover \rightarrow purified water tank \rightarrow make up water pump \rightarrow cooling tower.

6. CIVIL ENGINEERING

6.1 Geology of the Project

Soil and Geological Investigations has been conducted and the results are presented in the report attached.

6.2 Meteorological Conditions

Ambient Air Temperature (Max./Mean/Min.)	48 / 25 / 2°C
Relative Humidity (Max., Mean, Min.)	90 / 60 / 24 %
Dry Bulb Temperature (Design)	50°C
Wet Bulb Temperature (Design)	32°C
Relative Humidity (Design)	60 %
Absolute Atmosphere Pressure (Max/Mean/Min.)	992 / 980 / 973 mbar
Temperature difference between day and night (Mean, Max.)	10 / 17
Rainfall — Average annual (Max/Mean/Min.)	78 / 25 / 6.8 mm
Rainfall — Heaviest fall in 24 Hours	332 mm

■ Construction and Structure of Turbine

Adopt reinforced concrete structure for the main power building and column space can be 6m respectively Span of turbine house, deaerator room, coal bunker room and boiler house shall be 16m, 4.7 m and 27m respectively.

There are 4 column spaces for turbine house and total length is 24 m. Adopt light steel roof truss with color coated steel sandwich board roof. Set a hook bridge type crane of 10/5t. There are 4 column spaces in deaeration coal bunker room and total length is 27m. Adopt reinforced concrete flooring and roof and roof elevation is 24 m. Total length of boiler room is 27m and it is required to adopt reinforced concrete slabs for boiler platform whose elevation is 7.0m.

The main power building belongs to Category D and Class II fireproof buildings and fireproof wall and door shall be set according to fireproof specifications. Adopt plastic-steel windows for lighting windows and adopt side-hung or push-pull windows near the ground and others are fixed or side-hung windows. Brush white coating on inner wall and brush masonry mortar,

mixed mortar and coating for outer wall and execute specifications and standards for residual interior decoration.

Auxiliary System Buildings and Structures

Reinforced concrete structure is used for chemical water room, with equipment room of 60x12m + 6x21m span, steel column and beam, concrete floor, cast-in-place concrete roof, rolled material water-resistant roof. VFD room adopts 7.5x14m reinforced concrete structure, concrete floor, cast-in-place concrete roof, rolled material water-resistant roof. Compressed air station adopts 7.5x12m reinforced concrete structure, concrete floor, cast-in-place concrete roof, rolled material water-resistant roof.

Screen and crusher building adopts 15x15m reinforced concrete structure, concrete floor, cast-in-place concrete roof, rolled material water-resistant roof. Ignition oil pump house adopts 4x9m reinforced concrete structure, concrete floor, cast-in-place concrete roof, rolled material water-resistant roof. Circulating water pump house adopts 9.5x43.5m steel structure, concrete floor, and color steel plate water resistant roof. Dry coal shed adopts 30x60m steel structure, concrete floor, retaining wall, and color steel plate water-resistant.

7. HEATING, VENTALIATION AND AIR CONDITIONING PART

7.1 Design Basic

"Code of Design on Heating, Ventilation and Air Conditioning" (GBJ19-87 of version 2001)

"Design Regulations of Labor Safety and Industrial Sanitation of Cogeneration Power Plants" (DL5053-1996)

Design requirements provided by various specialties

8. LIVING WATER SUPPLY

Cement plant shall provide living water to meet living drinking water standard.

8.1 Drainage in Plane Zone

Shunt drainage system of rainwater and living sewage shall be used for drainage of power plant. Of little living sewage discharge, there is no living quarter in power plant and living sewage should discharge into anaerobic tank for drainage after treatment. Industrial water is recycled for secondary use. Small amount of industrial water which meets discharge standards can directly discharge. Acid/alkali wastewater of water treatment room can discharge after neutralization treatment in neutral reservoir and reaching the discharge standard. Blow-down water of cooling tower can directly discharge after meeting the discharge standards.

9. FIRE PREVENTION SYSTEM

9.1 Fire Separation Distance

Fire separation distance and the minimum gap between various buildings (or structures) of power plant shall be in accordance with "Code of Fire Control of Building Design" (GBJ16-87) of version 2001, "Code of Design on Fire Control of Cogeneration

• Power Plants and Transformer Substation" (GB50229-96) and "Code of Design on Small Cogeneration Power Plants" (GB50049-201).

9.2 Fire Fighting Access

Firefighting access is set around various buildings (or structures) in the plant zone. Width of main road is double lanes of 7m and secondary road is single lane of 4m. It is connected to roads out of this plant.

9.3 Fire Control of Main Building

Fire hazard of main building is Class IV and fire resistance rating of building is Grade II. Solid wall of which fire resistance rating is not less than 4h shall be used as fire wall below Row B of operating floor. Fire resistance rating of partition wall above operating floor is not less than 1.0 hour. Door of Station auxiliary transformer room is Class B fireproof door and that of outgoing wire chamber of generator is Class C fireproof door. All fireproof doors shall be opened toward evacuation direction.

10. COST ESTIMATION AND FINANCIAL ANALYSIS

The cost estimation and financial analysis is the most crucial part of a project as it determines that the project is able to provide cost-efficient and economical energy in comparison to the electricity purchased from DISCO and gives a reasonable return to investor. It gives the expenditure and saving stream for the project. The saving stream thus calculates financial rate of return of the project. Accordingly, in this chapter of the report, details of all type of costs and savings derived along with internal financial rate of return (IFRR) has been discussed. However, it should be kept in mind that most of the cost numbers are estimates and can change based on actual expenditure. The regulator also allows us the estimated cost in the feasibility study could be adjusted on award of EPC contract and thereafter at the time of start of commercial operation. Thereafter it will be seized for entire concession period. However, it is also necessary that estimates should be as closed as actual. Accordingly, the estimations have been made on logical justification.

For a power plant major portion of the cost estimates goes to EPC cost. In this report the EPC cost is based on some supplier's budgetary price as manufacturer are hesitant to provide firm cost at this stage of the project as they are not sure that they will be getting the contract or not. The sponsor's approach towards the EPC contract will be to award the contract in most transparent manner and on competitive basis. Accordingly, it is expected the total cost of the project might change to some extent.

Based on the above philosophy the financial analysis is conducted. In the subsequent section of this report total estimated cost of the project along with it technical and financial assumptions and rationale in each assumption has been discussed in detail.

10.1 Cost Estimate

The estimated total investment of the plant is presented in the Table 1-1. PKR/USD exchange rate of 105 has been assumed.

The EPC contract covers the supply and transportation of all electrical and mechanical components of the power plant together with all the necessary auxiliary machinery, equipment and systems including the erection, testing and commissioning of these equipment and Civil works. The EPC price of the power plant is based on a budgetary turn-key proposal.

Table 10-1: Project Capital Cost

Head	Amount (PKR'000)	Amount (USD'000)
EPC Cost:		
Building & Steel Structure	75,000	714.29
Plant & Machinery:		
Turbine	16,500	157.14
Boiler Parts incld. insurance cost	63,664	606.32
Other Parts	25,735	245.10
Local Material	23,320	222.10
Services	20,000	190.48
Electric Installation	55,000	523.81
Transportation, Custom Duty, GST	41,389	394.18
Total EPC-Cost:	320,608	3053.42
Non-EPC Cost:		
Land	18,000	171.43
Owner Admin	17,500	166.67
EPC Design	19,236	183.20
Owner Engineer	6,412	61.07
Office Equipment	2,000	19.05
Consultancy	25,000	238.10
Registration (Pre-Operating Cost)	5,000	47.62
Total Non-EPC Cost	93,148	887.14
Total Capital Cost	413,756	3940.56

10.2 Brief of Costs Estimated

■ EPC COST

Budgetary EPC cost has been obtained from various EPC contractors. However, the EPC cost may need to be adjusted after final negotiations with EPC contractor and award of contract.

The cost covers the following:

• Electro Mechanical Equipment:

US\$ 1.945 million cost have been estimated for E & M, the cost component of power plant includes Turbine, Boiler parts, Local Material, Generator, Control and Protection equipment and substation

for transformation of power to the transmission line.

Building and Steel Structure:

Building and steel structure comprises of building for the plant and warehouse to store coal and spare parts with all utilities access road, clearing and grubbing, stripping, mobilization and demobilization costs, which is estimated at US\$ 0.714 million.

Transportation, Port Clearances, Custom Duty & GST:

All of the electro-mechanical equipment including turbine, boiler and generators are to be imported. These materials are to be shipped from the country of its manufacturer and special arrangements for its inland transportation are to be made. The cost of freight, shipment and insurance etc. from the country of manufacturer has been at US\$ 0.394 million. The cost also includes the Custom Duty and General Sales Tax applicable in Pakistan.

Project Development Cost:

Land Acquisition and Environment Mitigation Cost

Land purchase cost covers the payment of the cost of land to the owner of the land/property as well as the cost of fill to level the site for construction purposes. Major bases of environment mitigation cost are for the measures taken at pre-construction and construction stages. The cost under this head is estimated about US\$ 0.171 million.

Project Engineering, Supervision & Consultancy.

The cost of Engineering & Supervision includes cost of Owner's Engineer was reasonably estimated about US\$ 0.061 million. The Sponsor also understand that Engineering design cost component is essential and will be borne by the Project for which US\$ 0.183 million has been estimated. Further, the sponsor estimated US\$ 0.238 million in the account of consultancy services required to be paid for the environmental services, environmental management and mitigation plan, right of way, acquiring generation license from NEPRA etc.

Owner Administration & Overhead

The Owner's administration cost includes salaries, wages, utilities, vehicles, travel and conveyance, office supplies, rent and rates, medical, insurance, depreciation, Auditor's remunerations, amortization, lease rentals, inventory, computer software, site office expenses for the owner as well as lenders. The estimate cost worked out is about US\$ 0.186 million. The cost also includes the equipment required to setup the office.

• Legal Fee, Charges & Taxes

This estimated cost is US\$ 0.048 million which includes the government licensing fee for the generation license as per NEPRA standards, procedures, EPA fee for the approval of IEE and company registration fee. The cost also includes cost related to the stamp duties for land acquisition.

10.3 Technical Assumptions

The plant operation is guaranteed round the clock for 365 days a year. Annual energy output is computed based on these figures.

Gross Capacity	MW	6.50
Auxiliary Load	KW	950.00
Load Factor		100%
Force Shutdowns	Days	15
Operational Hours in an Year	Hrs	8,400
Net Capacity	MW	5.55
	GWh	54.6
Gross Annual Energy	KWh	54,600,000

Auvilianchand	GWh KWh	7.98
Auxiliary Load		7,980,000
Net Electrical Output	GWh	46.62
	KWh	46,620,000

10.4 Financial Assumptions

Following are the assumption made to compute the cost estimation and analysis of the project:

Exchange Rate (PKR to USD)	105
Financing: Equity	100%
Plant Life (Years)	20
Average Inflation Rate (http://www.tradingeconomics.com/pakistan/core-inflation-rate)	5.30%

Coal Consumption:

Coal Consumption Per kWh	gram	622
Total Coal Consumption	tons	33,961
Energy in a day	KWh	156,000
Coal Consumption per day	tons	97.03

Coal Cost:

Coal Cost	PKR Per GCV	2.3
GCV	GCV	4,800
Cost exclusive of Tax	PKR Per Ton	11,040
	PKR Per Kg	11.04
Transportation Cost	PKR Per Ton	3,000
	PKR Per Kg	3.00
Cost of Coal including Transportation	PKR Per Ton	14,040
	PKR Per Kg	14.04
GST	%age	17%
Cost inclusive of Tax incld. Transportation	PKR Per Ton	15,916
	PKR Per Kg	15.92
Total Cost of Coal including Transportation	PKR Per annum	563,720,212

Coal Inventory

Coal Required Per Day	tons	97.03
Coal Storage	days	30.00
Coal Storage for 30 days	ton	2,910.96
Total Coal Cost for 30 days	PKR	46,333,168

Salaries

Salaries:	Quantity	Amount (Per Month)	Total Salary (Per Month)
General Staff:			
Chief Engineer	1	120,000	120,000
Office Asstt.	1	15,000	15,000
Boiler Engineer	1	50,000	50,000
Boiler Foreman	1	40,000	40,000
Boiler House Fitter.	1	25,000	25,000
Turbine Engineer	: 1	50,000	50,000
Turbine Foreman General Shift	1	40,000	40,000
Turbine Fitter General Shift	. 1	25,000	25,000
Electrical Engineer	. 1	50,000	50,000
Electrical Foreman	1	40,000	40,000
Electrical Supervisor	1	25,000	25,000
Boiler Operation:			The state of the s
Boiler Supervisor.	3	25,000	75,000
Fire Man	6	20,000	120,000
Water Man	6	18,000	108,000
Auxiliary operator.	6	15,000	90,000
Boiler Coolies	6	13,000	78,000
Turbine Operation:			
Turbine operator	3	25,000	75,000
Auxiliary Plant operator	3	20,000	60,000
Trainee	3	15,000	45,000
Generator Operator:			The second secon
Switch Board Operator	3	25,000	75,000
Trainee	3	15,000	45,000
Admin & Account Staff:		-	
Accounts Manager	1	75,000	75,000
Accounts Asstt	3	20,000	60,000
Admin Manager	1	40,000	40,000
Admin Assistant	2	20,000	40,000

6.5 MW COAL FIRED POWER PLANT

Total Salaries (Per Annum)		21,732,000	
Total Salaries (Per Month)			1,811,000
Workers	8	15,000	120,000
Supervisor	1	25,000	25,000
Security Staff:			
Workers	4	15,000	60,000
Supervisor	1	40,000	40,000
Work Shop / Maintenance Staff:			
Assistant	3	20,000	60,000
Manager	1	40,000	40,000

Admin Cost

Head	Amount (PKR) Per Month	Amount (PKR) Per Annum
Stationery & Printing	15,000	180,000
Meal & Entertainment	35,000	420,000
Fuel	75,000	900,000
Miscellaneous	20,000	240,000
Total	145,000	1,740,000

Operation and Management Cost

Cost Per Unit	Rs./KWh	0.400
Annual Maintenance Cost	Rs./KWh	0.250
General & Workshop	Rs./KWh	0.050
Store & Spare	Rs./KWh	0.100

10.5 Cost Per Unit

The per unit cost of Items are calculated below:

Coal Cost	Kg	12.916
Transportation Cost	kg	3.000
Unit Coal Cost	kg	15.917
Coal Consumption	kg/KWh	0.622
Unit Coal Cost	Per KWh	9.900
Salaries	Rs./KWh	0.398
Capital Cost	Rs./KWh	0.379
admin	Rs./KWh	0.032
O&M Cost	Rs./KWh	0.400
Insurance	Rs./KWh	0.050

10.6 Capital Structure

The project is to be financed by the equity from its stake holders

Equity	US\$ (M)	3.941
Total Project Cost	US \$ (M)	3.941

10.7 CAPEX Disbursement

The CAPEX disbursement is based on the assumption of 12 months construction period. The percentage disbursement of different components of CAPEX will change as per EPC contracts. All expenditure is met through equity disbursement.

10.8 Operating Costs

Operating costs include O&M Cost which includes cost of store & spare, General workshop, Annual Maintenance cost and the Coal cost. Per unit costs (Rs/kWh) have been computed based on dependable capacity – the maximum possible energy the plant can deliver per annum.

Item	Unit	Value
Plant Capacity net	MW	5.5
Hours/Day		24
Days		365
Force Shutdown	Days	15
Net Electrical Output	GWh	46.62
O&M Cost	Rs/kWh	0.400
Coal Cost	Rs/kWh	9.900

10.9 Savings

Savings in producing the electricity as a captive power plant has been computed. Analysis have been conducted in comparing the electricity purchase from LESCO VS the electricity generated from the captive unit. The analysis enables to identify the profit/loss in setting up the project.

Auxiliary Consumption

The plant will consume some power generated in house that includes power house own consumption in lighting and other facilities that includes various pumps, overhead crane etc. Out of this load in power house, major load will be of crane. Though the crane will not be operated in normal case but it will be counted in connected load. It is estimated that about 0.5 MW will be consumed in the plant and residential colony.

Detailed Savings

<u>Years</u>	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Units Produced Gross (KWh)	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	46,620,000	
Cost of Purchasing the Produced Units:											
LESCO Average Cost of Unit (KWh)	14.93	15.72	16.55	17.43	18.36	19.33	20.35	21.43	22.57	23.76	
Purchase Price	696,048,831	732,939,419	771,785,208	812,689,824	855,762,385	901,117,791	948,877,034	999,167,517	1,052,123,395	1,107,885,935	
Cost of Generation Per Unit:											
Coal Cost	9.900	10.425	10.977	11.559	12.172	12.817	13.496	14.212	14.965	15.758	
Salaries	0.398	0.438	0.482	0.530	0.583	0.641	0.705	0.776	0.853	0.939	
Capital Cost	0.379	0.379	0.379	0.379	0.379	0.379	0.379	0.379	0.379	0.379	
O&M Cost	0.400	0.421	0.444	0.467	0.492	0.518	0.545	0.574	0.605	0.637	
Admin	0.032	0.034	0.035	0.037	0.039	0.041	0.043	0.046	0.048	0.051	
Insurance Cost	0.050	0.053	0.055	0.058	0.061	0.065	0.068	0.072	0.076	0.080	
Total Cost of Generation:		· · · · · · · · · · · · · · · · · · ·									
Per Unit	11.159	11.749	12.372	13.031	13.726	14.461	15.237	16.058	16.925	17.842	
Total	520,234,339	547,742,677	576,796,169	607,485,429	639,906,747	674,162,475	710,361,443	748,619,412	789,059,556	831,812,979	
Savings Per Unit:											
Per Unit	3.77	3.97	4.18	4.40	4.63	4.87	5.12	5.37	5.64	5.92	
Total -	175,814,492	185,196,742	194,989,039	205,204,395	215,855,637	226,955,316	238,515,591	250,548,104	263,063,839	276,072,956	

10.10 Financial Analysis

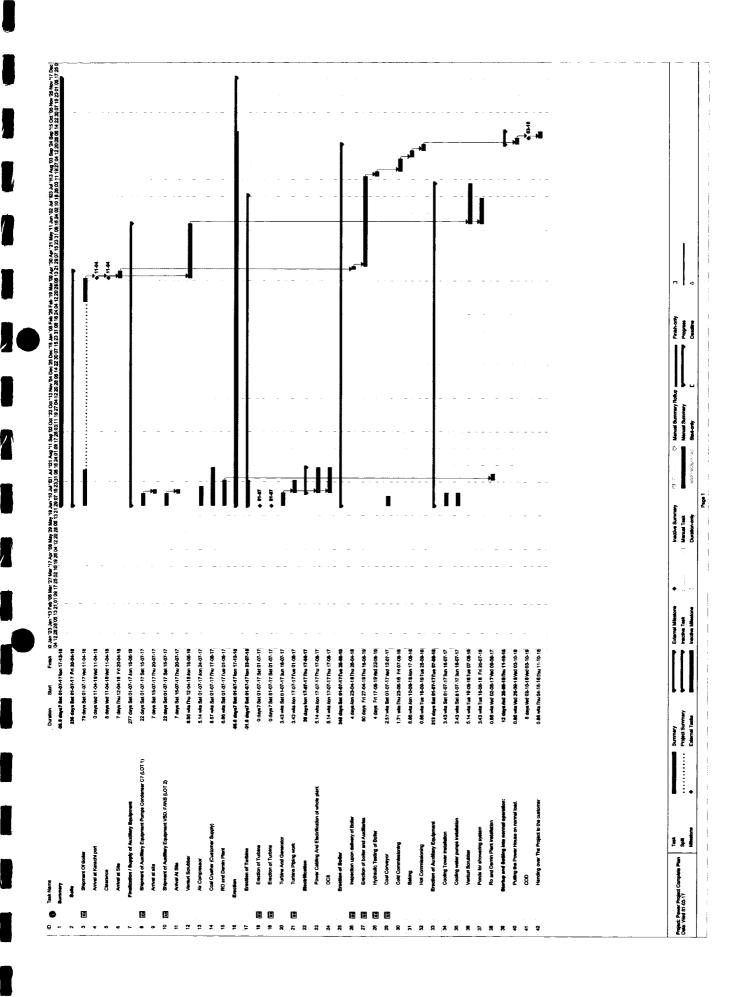
Financial analysis is done to evaluate the internal financial rate of return, payback period. Following assumptions has been for financial analysis:

- The project cost portion includes all costs that comprises of Coal cost, insurance cost, salaries, O&M cost etc.
- The net benefit is the difference of cost and revenue.

Results of financial analysis shows that the project carries IFRR of 55%. Detailed calculation is presented below:

Financial Analysis

Year	Coal	Salaries	Capital Cost	O&M Cost	Admin	Insurance	Free Cash	Free Cash	Net Cash Flow	
-1									(137,919,000)	
0									(275,838,000)	
1	9.900	0.398	0.379	0.400	0.032	0.050	3.771	205,908,864	205,908,864	
2	10.425	0.438	0.379	0.421	0.034	0.053	3.972	216,897,085	216,897,085	
3	10.977	0.482	0.379	0.444	0.035	0.055	4.183	228,365,541	228,365,541	
4	11.559	0.530	0.379	0.467	0.037	0.058	4.402	240,329,471	240,329,471	
5	12.172	0.583	0.379	0.492	0.039	0.061	4.630	252,803,900	252,803,900	
6	12.817	0.641	0.379	0.518	0.041	0.065	4.868	265,803,524	265,803,524	
7	13.496	0.705	0.379	0.545	0.043	0.068	5.116	279,342,584	279,342,584	
8	14.212	0.776	0.379	0.574	0.046	0.072	5.374	29 3 ,434,717	293,434,717	
9	14.965	0.853	0.379	0.605	0.048	0.076	5.643	308,092,784	308,092,784	
10	15.758	0.939	0.379	0.637	0.051	0.080	5.922	323,328,687	323,328,687	
11	16.593	1.032	0.379	0.670	0.053	0.084	6.212	339,153,145	339,153,145	
12	17.473	1.136	0.379	0.706	0.056	0.088	6.512	3 55,575,458	355,575,458	
13	18.399	1.249	0.379	0.743	0.059	0.093	6.824	372,603,228	372,603,228	
14	19.374	1.374	0.379	0.783	0.062	0.098	7.147	390,242,051	390,242,051	
15	20.401	1.511	0.379	0.824	0.066	0.103	7.482	408,495,171	408,495,171	
	Project IRR									
				2 years 3 months						



PROSPECTUS PURSUANT TO REGULATION 3(5)(1)

1. BRIEF INTRODUCTION OF THE APPLICANT:

Jilani Energy (Pvt.) Ltd. has been incorporated as a Special Purpose Vehicle for the project. Jilani Energy (Pvt.) Ltd. is wholly owned associated company by the directors of Javaid International (Pvt.) Ltd. and Jilani Poly Industries (Pvt.) Ltd.

Jilani Group

Jilani Plastic is a group of companies established in 1970 and has been operating as a leading plastic packaging products manufacturer in Pakistan. Over time, Jilani Plastic has become a powerful brand and a market leader. We have also had the honor of sustaining stable growth for almost Five decade now.

We are a reputed organization that is engaged in the manufacturing, supply, and export of packaging products ranging from polyethylene and polypropylene to shrink films, carry bags, agricultural films etc. We have a modern, integrated unit setup to manufacture high quality plastic packaging products. Building on a wealth of expertise and knowledge, we have evolved to serve the needs of a variety of customers and industries.

• Javaid International (Pvt.) Ltd.

Javaid International (Pvt.) Ltd. was incorporated as a private limited company in 1990 with a vision to become a world class manufacturer of polyethylene bags and sheets. Since our inception, we have strived towards achieving excellence in the packaging industry and are now an industry leader in polyethylene packaging, catering to all types of industrial, retail, and commercial applications.

Today, we operate from a 30,000 square-yard facility, equipped with modern, state-of-the-art manufacturing plant. We apply the latest techniques and strict quality control, dispatching approximately 150 tons of products every day.

• Product Portfolio:

Our product line consists of a variety of items which are as follows:

- Polyethylene Rolls & Sheets
- Shrink Films
- Agricultural Films
- Carry Bags
- Polyethylene Bags

Production Facilities

Technology is an integral part of our success. By keeping abreast with the rapid technological advancement in plastics manufacturing, we are equipped to meet specific requirements of the industry while staying ahead of the competition. Our production facilities include:

- Modern Extrusion Machines
- Environment Friendly In-House Recycling Facility
- Internal Edge Trim Recycling System
- Fully Automatic Material Feeding System

Logistics Network:

Our transportation and logistics network uses the most efficient and effective means to distribute our products to our customers. Our job is to get the right product to the right place, at the right time. We continue to optimize transportation costs while improving quality and striving to exceed the expectation of our customers. To facilitate our customers, we have various warehouses at different locations throughout the country which are connected to our production facilities through a strong supply chain network.

• Jilani Poly Industries (Pvt.) Ltd.

Incorporated in 2010, Jilani Poly Industries (Pvt.) Ltd. is one of the fastest growing manufacturers, suppliers and exporters of printed and non-printed Polypropylene Woven Sacks and Fabric. The application of our product line is diverse and is optimized for fertilizers and packaging of sugar, polymers and chemicals. Textile and mining industries are also two of our biggest customers.

We strive to become one of the top organizations engaged in manufacturing, supply and export of woven bags and packaging material. Our business strategy and ethics enable us to meet the requirements of our clients in a better way and also help in providing customized solutions as per their needs.

Our production facility expands over 37000 square-yard area. With a high-tech production line our production capacity is around 18,000 metric tons per annum, producing 60 tons per day.

We have experienced workforce having years of experience in their respective domains.

Product Portfolio:

We have a wide range of products catering to a broad spectrum of industries.

They include:

- Polypropylene Woven Bags And Sacks
- Hdpe Inner Liner
- Polypropylene Woven Fabrics
- Multi-Colored Printed Polypropylene Woven Bags and Sacks

Printing

Jilani Printing department stands Self-importantly at top leading level in Pakistan. Jilani is using modern and advance Flexo-Printing Technology and have ability to print six colors printing. A Huge production capacity 180 to 190 tons per month with best and fine printing Quality currently.

We offer a wide range of printing services to our both commercial and individual customers for use in the Garment Industry, beverages Industry, Food industry, Textile Industry, Sugar industry, Foam Industry, Shoe Industry, Tire Industry, fertilizer, chemicals, rice and many more.

Our production facility is well-equipped with the resources to handle the requirements of our clients and provide them with reliable service. We have our inhouse design department for developing excellent designs for the complete satisfaction of our valued customers.

Quality Assurance:

Being a quality driven organization, our goal is to maintain the highest standard for our products. We provide a comprehensive range of polypropylene packaging bags that meet the strict international quality standards. To maintain quality in our products, we follow stringent quality control processes at our state-of-the-art lab from the procurement of raw material to packaging. Our team of quality control experts monitors the processing methods and supervises all the areas efficiently to maintain a high quality product.

The details CVs and Contractor Profile has been provided as Annexure E & F of the application

2. SAILENT FEATURES OF THE FACILITY OR THE SYSTEM IN RESPECT OF WHICH THE LICENSE IS SOUGHT:

Regulation No. 3(5)-A(i) - Certificate of Incorporation:

Provided as Annexure-A of the submitted application

- Regulation No. 3(5)-A(ii) Memorandum of Articles of Association:
 - Provided as Annexure-B of the submitted application

• Regulation No. 3(5)-A(iii) – Latest financial statement:

Jilani Energy (Pvt.) Ltd. has recently be incorporated as a Special Purpose Vehicle for the project. Jilani Energy (Pvt.) Ltd. is wholly owned company by the directors of Javaid International (Pvt.) Ltd. and Jilani Poly Industries (Pvt.) Ltd. therefore, the annual financial statements of 2014-2015 of the sister-concerned company is submitted along with the wealth statement of directors of the company. Financial statements and wealth statement are attached as Annexure-C of the Application.

• Regulation No. 3(5)-A(iv) and Schedule III-Regulation 3(6)A-(a)-1– Location (location map, site map):

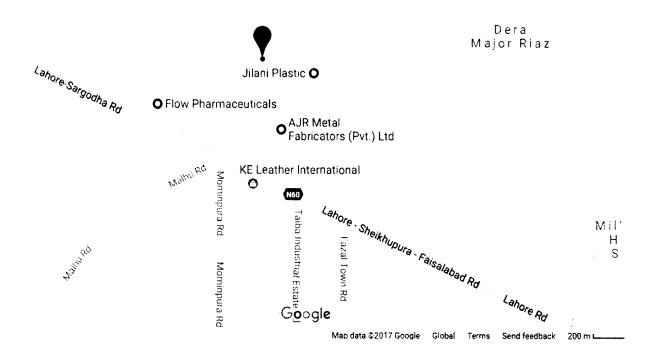
The project is located at 17-km, Lahore-Sheikupura road near Jilani Plastic. The Coordinates of the area are: 31.647534, 74.185070

The location is accessible from Islamabad through Islamabad Motorway (M2). The distances are:

Islamabad Motorway to Kot Abdul Malik Motorway Exchange	332 km
Kot Abdul Malik Toll Plaza to Jilani Energy	7.4 km

Mughal Steel Croup of Industries

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QURESHIAN



Regulation No. 3(5)-A(v) and Schedule III-Regulation 3(6)A-(a)-2 – Type of Technology:

- Production capacity of the power plant electricity output from Generator: 1 *
 6.5 MW.
- Boiler: 1 * 35t/h Coal Fired Boiler; Steam Pressure: 6.5MPa; Steam Temperature:
 480 Celsius Steam Turbine: 1 * 6.5MW condensing, 6.5MPa, 470 Celsius.
- Generator: 1 * 6.5 MW generator, 1500rpm, 11kV, Static excitation.
- Circulating Cooling Water: Fresh water circulating water system (Mechanical draft cooling system).
- Electric System: Medium voltage (11kV) electricity from generator outgoing feeder panel; low voltage (400V) system from supply electricity to power plant itself only.

The power plant adopts to both local and imported coal as fuel, whichever is more economical.

Feasibility Study Report along with the civil drawings, Soil Investigation Report, Plant layout and topographic Survey is attached as Annexure-H of the application.

Regulation No. 3(5)-A(vi) – Number of Units (No.)/Size (MW):

One unit will be installed with the plant capacity of 6.5 MW

 Regulation No. 3(5)-A(vii) – Year Make/Model, Operation Date and expected remaining life:

Boiler Xing Fu Boilers China, 35 t/h CFB turbine Dresser RAND PBH T156065.

Year Make: April 2009. FRAM-12-Steam Turbine

Remaining Life: 20 years

 Regulation No. 3(5)-A(viii) – Installed Capacity, de-rated capacity, Auxiliary Consumption, Net Capacity:

- Installed Capacity: 6.5 MW

- Auxiliary Consumption: 950 KW

- Net Capacity: 5.55 MW

- Regulation No. 3(5)-A(ix) and Schedule III-Regulation 3(6)(a)-3 Fuel: type, imported/indigenous, supplier, logistics, pipelines etc.
 - Jilani Energy (Pvt.) Ltd. will use Coal as its fuel. It will use both imported and indigenous coal at the rate of 4981 Calorific Value/kg. Coal consumption for power generation is 622g/kWh.

- There are number of local and international suppliers that are already providing coal.
- Daily consumption of plant is expected to be around 97.03 tons.
- Pipelines are not applicable.
- Regulation No. 3(5)-A(x) Supply Voltage (11kV/132 kV), in case of 132 kV voltage distance and name of nearest grid (Signle Line Diagram):

Medium voltage (11kV) electricity from generator outgoing feeder panel; low voltage (400V) system from supply electricity to power plant itself only.

- Regulation No. 3(5)-A(xi) and Schedule III-Regulation 3(6)(a)-13— Plant Characteristics: Generation voltage, frequency, power factor, automatic generation control, ramping rate, alternative fuel, time(s) required to synchronize to grid:
 - Generation voltage: 11 kV
 - Frequency: 50 Hz
 - Power Factor: 0.8
 - Automatic Generation Control: Yes
 - Ramping Rate: 3 hours on cold / 30 minutes on hot.
 - Alternative Fuel: Not applicable
- Time(s) required to synchronize to grid: Not applicable
- Regulation No. 3(5)-A(xii) and Schedule III-Regulation 3(6)(a)-14—Provision of Metering, Instrumentation, Protection and Control arrangement:

Control, Metering, Instrumentation and protection will be in accordance with ISA (The International Society of Automation) standards. Detail Interconnection study has been provided in the Annexure-F "Interconnection Study Report" of the application.

3. PROPOSED INVESTMENT:

The total project cast has been estimated at USD 3,940,560/-. The project company shall inject all the cost as the equity. No debt is required from the bank to setup the project.

Head	Amount (PKR'000)	Amount (USD'000)
EPC Cost: Building & Steel Structure	75,000	714.29
Plant & Machinery:		
Turbine	16,500	157.14
Boiler Parts incld. insurance cost	63,664	606.32
Other Parts	25,735	245.10
Local Material	23,320	222.10
Services	20,000	190.48
Electric Installation	55,000	523.81
Transportation, Custom Duty, GST	41,389	394.18
Total EPC-Cost: Non-EPC Cost:	320,608	3053.42
Land	18,000	171.43
Owner Admin	17,500	166.67
EPC Design	19,236	183.20
Owner Engineer	6,412	61.07
Office Equipment	2,000	19.05
Consultancy	25,000	238.10
Registration (Pre-Operating Cost)	5,000	47.62
Total Non-EPC Cost	93,148	887.14
Total Capital Cost	413,756	3940.56

Detail estimation and analysis has been provided in the Feasibility Study Report in Annexure-H of the Application.

4. THE SOCIAL AND ENVIRONMENTAL IMPACT OF THE PROPOSED FACILITY

No adverse impacts have been observed with respect to the Plant. The baseline monitoring data has been measured. The detail environmental study has been conducted and submitted to EPA Punjab for approval. The submitted study has been attached as Annexure-K of the application submitted.

EFFICIENY PARAMETERS UNDER REGULATION 3(6) SCHEDULE-III PART A(a)

- a) Designed Efficiency of the Plant: 24.1%
- b) Gross Efficiency of Power Plant at mean site conditions: 23.87%
- c) Net Efficiency of Plant at mean site conditions: 20.46%

OF 6.5 MW JILANI COAL FIRED POWER PLANT

February, 2017

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Executive Summary

Jilani Energy (Pvt.) Ltd., an associated company of Jilani Group of industries, is installing a Coal-fired Power Plant to provide steam and 6.5 MW Power to processing units thus meeting the requirement both of Steam and Power required for the processing units. The proposed Power Plant is located adjacent to the processing plants. This report covers the connection assessment studies for 6.5 MW Jilani Coal Fired Power Plant project located adjacent to the proposed Power Plant.

Connection assessment of '6.5 MW Jilani Coal Fired Power Plant is to assess the impact of the suggested interconnection scheme for the '6.5 MW Jilani Coal Fired Power Plant' to the Jilani group processing units.

The grid interconnection scope for power transfer of '6.5 MW Jilani Coal Fired Power Plant' to the Jilani and Javed processing units is projected with;

- 11 kV Single Circuit Line, approximately 600 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5 MW Jilani Coal Fired Power Plant to 11 kV bus bar of Jilani processing unit.
- 11 kV Single Circuit Line, approximately 400 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5 MW Jilani Coal Fired Power Plant to 11 kV bus bar of Javed processing unit.

The Power Plant was analyzed for load flow and short circuit studies to determine whether the plant connection with the processing units meets the NEPRA Grid Code requirements or otherwise.

The steady state and sequence data for the 6.5 MW Jilani Coal Fired Power Plant is processed to build the steady state and short circuit models in PSSE software format respectively.

The power flow analysis shows that the bus voltages and line loadings are within acceptable limits of defined Planning Criteria. The results were also validated as per the standards of line loading and bus voltage limits.

Maximum and minimum short circuit levels at point of interconnection buses of '6.5 MW Jilani Coal Fired Power' were computed. Moreover, in order to check the short circuit current contribution of '6.5 MW Jilani Coal Fired Power Plant', maximum short circuit levels at the Processing units buses located in vicinity of the project is also computed. The results show that fault levels are within the circuit breaker duties.

Based on the study results, overall it is concluded that proposed generation connection for '6.5 MW Jilani Coal Fired Power Plant' meets the NEPRA Grid Code and Planning Criteria.

1. Introduction

1.1 Project Background

Electrical Power is essential for running machinery in factories and industrial units. There has been an enormous increase in the demand of electrical energy during last two decades due to industrial development but unfortunately there has been no significant enhancement in energy production. Therefore, demand supply gap subsequently substantial energy crisis is looming over Pakistan.

Keeping in view the severe energy crisis in the country Jilani group has decided to setup a Coal based Power Plant which will be sufficient enough to fulfill the energy requirements of the Jilani Group companies located adjacent to the Power Plant. Coal based Power is economical, efficient and viable option in comparison to other sources like fuel based which are more expensive.

Jilani Energy Power (Pvt) Ltd., is an associated company of Jilani Group projected Coalfired Power Plant to provide steam and 6.5 MW Power to processing units thus meeting the requirement both of Steam and Power required for the processing units. The proposed Power Plant is located adjacent to the processing plants. This report covers the connection assessment studies for 6.5 MW Jilani Coal Fired Power Plant project.

Detailed interconnection scheme and related potential issues regarding the proposed power evacuation scheme through a point of common coupling are addressed in the subsequent sections.

'6.5 MW Jilani Coal Fired Power Plant' can be interconnected with the Jilani and Javed industrial units at 11 kV voltage level.

1.2 Objective of the Study

The principal objective of this study "Connection assessment of '6.5 MW Jilani Coal Fired Power Plant is to assess the impact of the suggested interconnection scheme for the '6.5 MW Jilani Coal Fired Power Plant' to the Jilani group processing plants.

The following studies and tests are carried out in order to check the robustness of Coal Fired Power Plant and technical feasibility of the proposed interconnection scheme.

- 1. Field survey and data processing.
- 2. Load flow analysis.
- 3. Short circuit analysis.

The above studies were carried out to demonstrate that the proposed connection plan of this plant meets the National Electric Power Regulatory Authority (NEPRA) Grid Code Planning Criteria.

The system operational capability is analyzed by the steady state analysis under normal condition and Short Circuit analysis of the system under fault conditions.

1.3 Terms of reference

The studies package include, load flow studies and short circuit studies to assess whether the plant connection with the processing plants meets the NEPRA Grid Code requirements.

- The load flow study investigates and addresses the voltage profile and overloading issues of the transmission network as a result of the proposed interconnection scheme.
- The short circuit study evaluates the short circuit levels of power plant's switchyard and contiguous network.

2. Methodology and Assumptions

2.1 Methodology

The methodology of the gird interconnection study follows the NEPRA Grid Code planning criteria and the studies are carried out in the following sequence:

All the technical data, relating to the specifications of '6.5 MW Jilani Coal Fired Power Plant' is collected from project sponsor.

- The information and data regarding the interconnection arrangements for the said Power Plant involves discussion made with plant engineers and site surveys.
- The power plant data is processed and then modeled. Updated system network is then reviewed and tested for its validity.
- The most appropriate interconnection proposal is prepared and analyzed for power transfer from the Power Plant on the basis of results obtained through system studies.
- Comprehensive load flow and short circuit analysis have been carried out to determine the adequacy of the proposed interconnection arrangement as per NEPRA Grid Code planning criteria.
- Results are compiled and analyzed in detail for above simulations effectively in order to conclude the study and complete the report accordingly.
- Recommendations are submitted based on study results and findings.
- All the system data processing, modeling and simulations are carried using PSSE software.

2.2 General assumptions

Following are some of the important assumptions used for this study:

- The generation plan used for the subject study as per proposed Power Plant generation.
- Dispatch of the generation power plants is taken based on the design capacity.
- The basic data for '6.5 MW Jilani Coal Fired Power Plant' is provided by Project Manager of Jilani CFPP. Otherwise, reasonable assumptions are made based on prudent industry practices for any missing or unavailable data.

3. Interconnection Scope

The particular objective of this study is to develop and simulate proposed and agreed connection plan for the subject Coal Fired Power Plant with Jilani and Javed processing units such that there is no physical limitation regarding the Right Of Way (ROW) and free available capacity is accessible at the load points. Single option for power evacuation of '6.5 MW Jilani Coal Fired Power Plant as the same is most suitable and no other option available in the area.

The grid interconnection scope for power transfer of '6.5 MW Jilani Coal Fired Power Plant' to the Jilani and Javed processing units is projected with;

- 11 kV Single Circuit Line, approximately 600 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5 MW Jilani Coal Fired Power Plant to 11 kV bus bar of Jilani processing unit.
- 11 kV Single Circuit Line, approximately 400 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5 MW Jilani Coal Fired Power Plant to 11 kV bus bar of Javed processing unit.

4. Field Survey and Data Processing

4.1 Site Surveys and Related Meetings

6.5 MW Jilani Coal Fired Power Project is located adjacent to Jilani Polymer and Javed International processing units. The field survey of site was carried out in order to ensure the Right of Way (ROW), space availability at interconnection points and actual distances between the Power Plant Switchgears and Bus bars at the processing units.

4.2 Collection of Data

Power plant's location with coordinates, generation units and transformation requirements, steady state and other basic data of power plant is provided by Project Manager of Jilani CFPP. However, reasonable assumptions were made to complete the study and the report, whenever certain information was unavailable or needed correction in the provided data.

4.3 Processing of Power Plant Data

Processed the raw data received from Jilani CFPP into the PSSE software format in order to model the Jilani Coal Fired Power Plant and the proposed interconnection scheme in PSSE and to perform the simulation studies.

The base case is simulated by considering standard checks like convergence, mismatch, number of iterations, voltage and thermal limits etc.

Jilani Coal Fired Power Plant data is processed to build the following basic models in PSSE software format:

- i. Steady state data for load flow analysis.
- ii. Sequence data for short circuit analysis.

4.3.1 Steady State System Modeling

Jilani Coal Fired Power Plant would have the net active power output of 6.5 MW as communicated by project sponsor.

Steady state models of generator and transformers at Jilani Coal Fired Power Plant in PSSE software as under:

- '6.5 MW Coal Fired Power Plant has been modeled with single generator having Pmax=6.5 MW, Qmax=4.0300 MVAR @ 0.8 lagging power factor, Qmin=-3.120 @ 0.9 leading power factor.
- 11 kV Single Circuit Line, approximately 600 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5 MW Jilani Coal Fired Power Plant to 11 kV bus bar of Jilani processing unit and 11 kV Single Circuit Line, approximately 400 meters with 500 MCM Single Core Power Cable from 11 kV switchgears of 6.5

MW Jilani Coal Fired Power Plant to 11 kV bus bar of Javed processing unit have been modeled having its per unit (p.u) resistance, reactance and susceptance according to line length.

 Positive sequence parameters are employed in the steady state model of the under study power plant.

4.3.2 Sequence Data Modeling

The short circuit model of the 6.5 MW Jilani Coal Fired Power Plant is used to carry out short circuit studies at its own switchyard and existing adjacent load buses.

Short circuit model has been prepared by representing one generator having a certain MVA rating and by using the following parameters of the generating units;

- Positive sequence data.
- Negative sequence data.
- Zero sequence data.

5. Load Flow Analysis

5.1 Load Flow Study Objectives

A power flow study (or load flow study) is an analysis of the magnitude of bus voltages, line loadings, phase angles of the bus voltages and power flows in a power system under steady-state conditions.

The main goal of load flow analysis is to develop a reliable connection arrangement between the '6.5 MW Jilani Coal Fired Power Plant' and the Jilani as well as Javed processing units, for the evacuation of 6.5 MW power from the Jilani Power Plant.

A base case model has been prepared, consisting of all 11 kV system, and studies for the entire system have been carried in order to assure that the proposed connection plan of the Jilani Coal Fired Power Plant is realistic for the maximum load settings.

The power flow conditions are studied through the system study cases that include Power generation, transmission facilities, and load representing the queue position applicable to this project.

Following are the important objectives of load flow analysis:

- Confirmation that no voltage and thermal loading limits are exceeded as per NERPA Grid Code Planning criteria.
- Confirming that voltage profile of the system is as per NEPRA guidelines.
- To confirm that Transmission line loadings in terms of Active (MW) and Reactive Power (MVAR) flows are within permissible limits.
- To confirm that Active Power (MW) loss in the network is not exceeding the allowable limits.
- To confirm that Transmission network and transformation reactive losses (MVAR) is not exceeding the allowable limits.
- Proposal of remedial solutions to any identified limitations or issues.

A relative approach has been used in the power flow analysis in order to determine the impact of the 6.5 MW Jilani Coal Fired Power project and its performance. The analysis was performed with the 6.5 MW Jilani Coal Fired Power plant and plotted on single line diagrams.

5.2 Load Flow Study Criteria

Load flow analysis is performed under the following conditions;

Steady state normal (N) operating conditions.

The Generation interconnection studies are carried out by considering the operational data defined by NEPRA Grid Code, which is listed as under;

5.2.1 Voltage limits

For the purpose of system planning, following voltage limits are defined for steady-state load flow analysis;

i. Under normal operating conditions (N condition) all bus voltages shall be within the bandwidth of $\pm 5\%$ of Nominal System Voltage.

5.2.2 Component loading limits

Loading criteria for current carrying components (transmission circuits, transformers, substation bus bars, circuit breakers, disconnect switches and auxiliary equipment) for the purpose of evaluating steady-state load flow studies is as follows;

i. Under normal operating conditions (N conditions), all components shall be loaded below their normal Continuous Maximum Ratings.

5.2.3 Frequency limits

The frequency of the System shall be nominally 50Hz and shall be maintained within the following limits defined for exceptional circumstances.

- i. Frequency Sensitive Mode shall be 49.8 Hz 50.2 Hz. Such a variation is permissible to allow frequency variations while ramping up generation and load pick-up.
- ii. Protected periods of operation of the system at the frequency in the range of 49.5 Hz 50.5 Hz (Tolerance Frequency Band).
- iii. Minimum/Maximum Acceptable Frequency Band shall be 49.5 Hz 50.5 Hz (Load Shedding Threshold or Contingency Frequency Band), which is well within the applicable IEC Standards.

5.2.4 Power factor

Power plant will manage reactive power control to maintain the power factor within the range of o.80 lagging and o.9 leading, at full active power output at its interconnection point.

(Reference: NEPRA Grid Code).

5.3 Conclusions of Load Flow Analysis

No incremental system overloads or voltage violations resulting from interconnection of '6.5 MW Jilani Coal Fired Power Plant' were found within the local study area. This finding was also validated through associated steady state system, overload and voltage violation screening outputs generated for the system model.

Thus, it can be concluded that the power flow on all the circuits connecting '6.5 MW Jilani Coal Fired Power Plant' are within defined limits and the voltages and loadings are in acceptable range of defined study criteria.

It is further observed that this localized generation helps in loss reduction and an improvement in voltage profile.

6. Short Circuit Analysis

6.1 Short Circuit Study Objectives

This section covers the short circuit analysis performed for the '6.5 MW Jilani Coal Fired Power Plant'. When generation is added to a system, the available fault current of that system increases. Therefore, short circuit study has been performed to determine the circuit breakers have adequate short circuit interruption duties.

Short circuit analysis includes the three-phase and single phase-to-ground fault simulations at 11 kV bus bars in the switchyard of subject Coal Fired Power Plant. The fault currents computed at the Power Plant buses would be used for selection of circuit breaker ratings.

Short circuit studies would determine the following;

- Maximum fault current levels at the Coal Fired Power Plant.
- Minimum fault current levels at the Coal Fired Power Plant.
- Total fault currents and contribution from the associated network.
- Adequacy of short circuit capacity of switchgears at neighboring existing processing units.

6.2 Short Circuit Study Assumptions and Criteria

Short circuit studies were carried out for evaluating the following short circuit levels of Power Plant's 11 kV bus bars and contiguous network;

- Balanced 3 phase fault levels.
- Unbalanced single phase to ground fault levels.

Short circuit currents were calculated for maximum and minimum fault levels according to International Electro technical Commission (IEC) standard IEC-909, with the following assumptions;

- For calculations of maximum fault levels;
 - Bus voltage has been assumed as 1.10 per unit (p.u) i.e. 10 % above the nominal.
 - o Maximum dispatch of the generation in the system has been taken.
- For calculations of minimum fault levels;
 - o Bus voltage has been assumed as 0.9 p.u i.e. 10 % below the nominal.
 - o Minimum dispatch of the generation in the system has been taken.
- Taps ratios of all the transformers to be assumed at unity.
- Charging of all the transmission lines to be assumed at zero.

• All the shunt compensations to be assumed at zero in positive sequence.

6.3 Maximum Short Circuit Study

In order to analyze the impact of the 6.5 MW Coal Fired Power Plant on the system, Short circuit analysis is performed after connecting with the processing units.

The total maximum short circuit levels at the bus bars of substations located in the electrical vicinity of the area of interest have been calculated and are tabulated below;

Table - 6.1: Maximum Short circuit levels with addition of Coal Fired Power Plant.

S.No.	Substation	Bus bar Voltage	3 Phase Short Circuit Level (kA)	Single Phase Short Circuit Level (kA)
1.	Coal Fired Power Plant bus bar	11 kV	5.88	1.96
2.	Jilani Polymer bus bar	11 kV	5.38	1.84
3.	Javed Plastic bus bar	11 kV	5-57	1.88

Maximum Short Circuit Study Report of Coal Fired Power Plant is attached in Appendix D

6.4 Minimum Short Circuit Study

Total minimum short circuit levels at the bus bars of substations located in the electrical vicinity of the area of interest have also been calculated and tabulated below;

Table - 6.2: Minimum Short circuit levels with addition of Coal Fired Power Plant.

S.No.	Substation	Bus bar Voltage	3 Phase Short Circuit Level (kA)	Single Phase Short Circuit Level (kA)
1.	Coal Fired Power Plant bus bar	11 kV	4.86	1.62
2.	Jilani Polymer bus bar	11 kV	4.44	1.52
3.	Javed Plastic bus bar	11 kV	4.60	1.55

Minimum Short Circuit Study Report Coal Fired Power Plant is attached in Appendix E

Note:

In the attached short circuit study reports, both three phase and single phase fault currents with polar coordinates and detailed output showing contribution from adjoining sources (i.e. lines and transformers connected to the bus bar) to the fault currents are included.

6.5 Conclusions of Short Circuit Analysis

Maximum and minimum short circuit levels are computed at the Coal Fired Power Plant for selection of circuit breaker ratings and relay coordination respectively.

Moreover, in order to see the short circuit current contribution of '6.5 MW Jilani Coal Fired Power Plant', maximum short circuit levels at the processing units located in electrical vicinity of the project are also calculated. The findings show that with addition of this project, fault levels do not exceed the standard circuit breaker ratings.

Therefore it is concluded that the proposed interconnection scheme holds good on the basis of short circuit analysis as well.

7. Overall Conclusions and Recommendations

'6.5 MW Jilani Coal Fired Power Plant' has proposed a generation connection scheme through a point of interconnection at 11 kV bus bar of Jilani Polymer and Javed Plastic processing units with 11 kV switchgears of Jilani Coal Fired Power Plant using 11 kV Single circuit Line, approximately 600 meters and 400 meters respectively with 500 MCM Single Core Power Cable.

Jilani group system load demand with inclusion of the Jilani Coal Fired Power Plant was analyzed through load flow and short circuit studies.

The power flow outputs depicts that the power flows on all the circuits are within the defined range and the voltages that appears at the bus bars are within acceptable limits of defined study criteria. Load flow analysis is also validated as per the given standards of line loading and bus voltage.

The short circuit studies have been carried out in order to check the contribution of '6.5 MW Jilani Coal Fired Power Plant' to the fault levels of the existing processing units in its electrical vicinity, the maximum and minimum fault levels with connecting the Jilani Coal Fired Power Plant are calculated. The findings show that with addition of this project, fault levels do not exceed the standard circuit breaker ratings. The study has also quantified the maximum and minimum short circuit levels at 11 kV (POI) buses of '6.5 MW Jilani Coal Fired Power Plant'.

Therefore, it is concluded that the proposed generation connection for '6.5 MW Jilani Coal Fired Power Plant' is appropriate on the basis of results of all the system studies.



INITIAL ENVIRONMENTAL EXAMINATION (IEE) REPORT

PROPOSED 6.5 MW JILANI COAL POWER PLANT, SHEIKHUPURA

Proponent:

Sheikh Shehzad Jilani (Director)

Jilani energy

Consultants:





office # 2, 2nd floor, 9- Kashmir Block, Allama Iqbal town, Lahore +92-301-4276787 & 92-303-9683522

ecosphiron@gmail.com





EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the main findings of the initial environmental examination for the proposed project that is Jilani Coal Power Plant with capacity of 6.5 MW coal based electricity generation to meet the needs Jilani Group. Said project location is 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura.

Jilani Plastic specializes in the production and manufacturing of high-quality plastic. In a consumer-driven environment distinctive packaging is vital. Jilani Plastic offers unrivalled expertise in developing packaging solutions for markets such as personal care, pharmaceutical, pet care, food, and household, where quality and style are critical to a product's success. Jilani Plastic is the group pf companies established in 1970 and there are four independent entities operating under the umbrella of Jilani Plastic: Javaid International, Jilani poly Industries, J-Zee Enterprises and new Jilani Energy. The application of our product line is diverse and is optimized for fertilizers and packaging of sugar, polymers and chemicals. Textile and mining industries are also two of our biggest customers.

Thus need of energy for production of plastic products is going to increase and Jilani Group has decided to make its own Power Plant. Now Jialni Group is about to establish its own Coal based power plant which will produce 6.5 MW energy. This will reduce the burden on national grid and Jilani Group will be independent in the source of energy. The proponent has decided to get its Environmental Approval before commencement of the project under section 12 of PEPA (Amended) 2012.

Indeed, it is a legal requirement in Pakistan to obey the environmental laws during carrying out any developmental activities and get it approved from the concerned regulating agencies before embarking on the development activities. Provincial environmental legislation also requires similar environmental approvals from relevant







provincial authorities (provincial environment departments). In addition, the aim of the IEE study is to ensure sustainable development in Pakistan. This IEE report provides an assessment of anticipated positive and negative environmental impacts of the proposed Project, along with the appropriate measures to further enhance the beneficial impacts and to mitigate any adverse impacts.

Jilani Coal Power Plant is committed to abide by all applicable legal and regulatory requirements and shall orient for continual improvement including prevention of pollution by establishing and monitoring of its quality and environmental objectives. The Chief Executive and management are committed to communicate and maintain this policy at all levels of the company and achieve continual improvement through teamwork.

SALIENT FEATURE OF PROJECT

Title and Location of Project:

Title of project is 6.5 MW Jilani Coal Power Plant at 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura.

About Proponent:

Name: Sheikh Shehzad Jilani S/O Sheikh Muhammad Jilani is proponent of this proposed Jilani Coal Power Plant.

Designation: Director (Jilani Energy)

Address: H. #212, Bawa Park Upper Mall, Lahore, District Lahore.

Environmental Consultants:

The Initial Environmental examination (IEE) has been carried out by aptly skilled and duly qualified group of professionals working for the environmental consulting firm namely Ecosphiron (Pvt.) limited in collaboration with Nasir Absar Consulting. Both companies have joint venture on this project. The consulting team can be approached through the following contact details:







Ecosphiron (Pvt.) limited

Address: Office # 2, 2nd Floor, Jalal Centre, Main Boulevard, Allama Iqbal Town,

Lahore

Contact #: +92-301-4276787 & 92-303-9683522

ecosphiron@gmail.com

Nasir Absar Consulting

Office 1, Second Floor, VIP Square Plaza, I-8 Markaz, Islamabad

Phone and Address: +92 345 9698321, ibrahim@nasirabsar.com

A brief outline of the proposal

Proposed project is Coal Power Project namely Jialni Coal Power Plant of Jilani Group. The said project will produce 6.5MW energy and it will be used by Jilani Group. Said project is based on parameters which make the project environment friendly. Project is located where industrial activities are already going on. The project has easy access to main cities e.g. Lahore by ring road and to Sheikhupura by Sheikhupura road. The project has no population around its radius of 8-10 km and biodiversity around the project is negligible. The project will contribute the positive aspect by reducing the energy load on WAPDA. Project will bring the prosperity by bringing the job opportunities for the nearest areas. Thus project is environment friendly in all aspects, further its details and management has been discussed in the report.

The major impacts and mitigation measure

Major impacts of Coal Power Plant are handling, storage and, transportation of coal, air and noise pollution. The impacts of concerned environmental impacts will be solved to make it zero pollution by implementing latest technologies. Coal will be place in storage area to reduce the risk of fire and moisture. Standard HSE measures will be taken to reduce the risk. Necessary measurement will be taken to reduce the risk of spilling and fire.







Proposed Monitoring

Monitoring has been carried out at project site with standards of monitoring mention in PEQS, 2016 and monitoring points were selected randomly within the radius of project periphery. At the proposed project site, ambient, water and noise level has been examined. Monitoring results has been discussed in baseline study chapter. Lab reports are attached herewith this IEE report as annexure.

Conclusion The Initial Environmental Examination (IEE) contains 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.

While the objectives of this study have been to describe the project and its environmental impact, it also identifies adverse environmental factors associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are 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.





The key persons involved in finalizing IEE report are following;

Mr. Istaqlal Haider

Environmentalist

Ms. Shakeela Rani

Environmentalist

Ms. Yusra Mahfooz

Environmentalist

For the Proponent

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

Sheikh Shehzad Jilani

Director (Jilani Energy)

Proposed 6.5 MW Jilani Coal Power Plant, Sheikhupura







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CHAPTER 1: INTRODUCTION

1.1 Purpose of Report

Purpose of the report is to carry out its Initial Environmental Examination (IEE) for the proposed project of 6.5 MW Coal Power Project for Jilani Group (which manufactures the plastic products) by providing and fulfilling the energy demand of the project. This report also intends to fulfill the regulatory requirements set under Punjab Environmental Protection Act 1997 (Amended 2012) and its consequent legislative framework for IEE/EIA including the IEE/EIA Regulations 2000 and the guidelines drafted for IEE/EIA under numerous sectoral heads. The entire set of legislative framework requires any new development project to undergo an IEE based on the categorization of the project under Schedule I.

1.2 Identification of Project and Proponent

1.2.1 About Proponent:

Name: Sheikh Shehzad Jilani S/O Sheikh Muhammad Jilani is proponent of this proposed Jilani Coal Power Plant.

Designation: Director (Jilani Energy)

Address: H. # 212, Bawa Park Upper Mall, Lahore, District Lahore.

1.2.2 Details of consultants

The Initial Environmental examination (IEE) has been carried out by aptly skilled and duly qualified group of professionals working for the environmental consulting firm namely Ecosphiron (Pvt.) Limited with Nasir Absar Consulting (Pvt.) Limited. The consulting teams can be approached through the following contact details:

Address: Office # 2, 2nd Floor, Jalal Centre, Main Boulevard, Allama Iqbal Town, Lahore &







Office 1, Second Floor, VIP Square Plaza, I-8 Markaz, Islamabad

Contact #: +92-301-4276787 & 92-303-9683522, +92 345 9698321

ecosphiron@gmail.com & ibrahim@nasirabsar.com

1.2.3 Brief description of project:

Electrical Power is essential for running machinery in factories and industrial units. There has been an enormous increase in the demand of Electrical energy in the last two decades due to industrial development, but sadly, there has been no significant increase in energy production. Therefore, supply of energy is far less than the actual demand. Consequently, a huge energy crisis is looming over Pakistan.

Keeping in view the severe energy crisis, Jilani Group has decided to set-up a Coal based power project which will be sufficient enough to fulfill the energy requirements of the Jilani Group Companies. Coal based Power is economical and viable option in comparison to other sources like fuel based which are more expensive. The project will reduce the energy burden on the WAPDA and will produce its own energy. Project location is idea as it is in the radius of industrial zone and population is away from the project site about 5 km in radius. Project will have access for the all fundamental necessities and link to main city Lahore via Link road and to Sheikhupura via Sheikhupura Road. Coal power project is located in the area where there is industrial activities are already going on. The objects around the project site are as following;

East: Jilani Company

West: Open Plot

North: Steel Mill

South: Open Plot

1.2.4 The project size

Said project is the project of Jilani group of Companies, produced energy will be utilized by its own companies for production/manufacturing of plastic products. The project will produce 6.5 MW Coal Power.





1.2.5 Location of the project:

Said project is located in the radius of industrial zone. The accurate location of the project is 17 Km Sheikhupura Road, Sowa Messon Kaller, District Sheikhupura.

Currently land is open plot.

1.2.6 Extent/scope of IEE Study

This IEE report has been conducted in accordance with the requirements of PEPA, 1997 (amended 2012), IEE/EIA Regulations 2000 as well as section 2.3 of the Guidelines for the Perpetration and Review of Environmental Reports, November 1997/2000. This IEE report presents screening of potential environmental impacts of the phase during installation of Coal Power Project and its operational phase and presents the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. The report provides an Environmental Management and Monitoring Plan (EM&MP) and the institutional requirements for the implementation of this plan. The IEE process followed all the complementary stages described in the guidelines for IEE/EIA preparation and review. A brief flowchart exhibiting the different stages involved is in figure 1.1



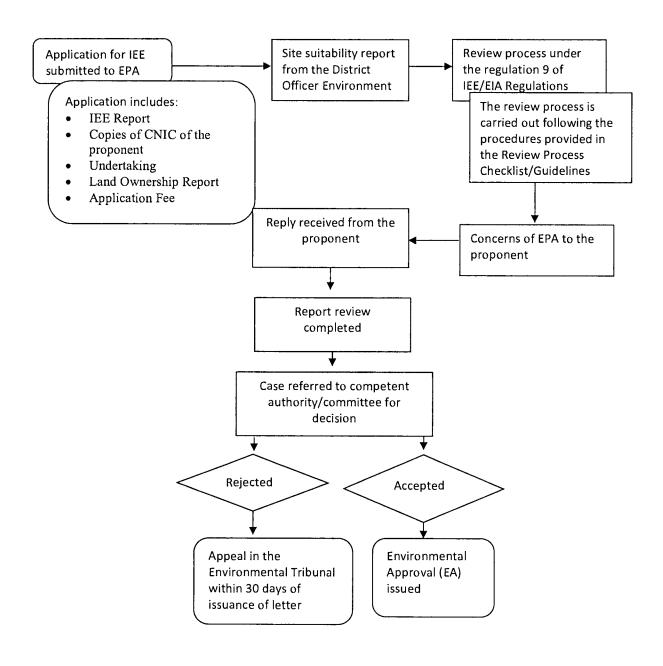


Figure 1.1: Complete Array to Follow the Environmental

Approval







1.2.7 Structure of the Report

IEE report comprises following chapters:

Chapter 1: Introduction (A description of the project, proponent and consultants, the need for the project and the report and method of preparing it).

Chapter 2: Project Description (Full description of the relevant parts of the project and summary of project inputs and outputs).

Chapter 3: Policy, statutory, and institutional Framework (A description of the pertinent national & provincial legislations, regulations and policies that are relevant and applicable to the project and a demonstration of how the project conforms to these aspects).

Chapter 4: Description of the environment (Description of project area's existing physical, biological and socio-economic condition, including geomorphology and soils, water resources, air quality, flora, fauna and demography).

Chapter 5: Project Impacts and mitigations (Presents an assessment of the project's impacts, suggested mitigation measures on the Physical, Biological and Socioeconomic environment, residual impacts and the monitoring requirements).

Chapter 6: Environmental Management Plan (Provides Environmental Management Plan & Environmental Monitoring Plan for the construction & operational phase of the project).

Chapter 7: Conclusions & Recommendations (Concludes the IEE report with a few recommendations to conduct the project in environment-friendly manner).









CHAPTER 2: DESCRIPTION OF THE PROJECT

2.1 Type and Category of project:

According to projects categorization for environmental assessment studies, the project that is 6.5 MW Jilani Coal Power Plant falls under Schedule I for Initial Environmental Examination (IEE) due to its cost, size, nature and overall severity and frequency of impacts. This report is required to fulfill the legal requirements set under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012). The subject project is 6.5 MW coal based to fulfill the requirement of energy for the Jilani Group at 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. According to the Punjab Environmental Protection Act 1997 (Amended 2012) and its interpretation as per Review of IEE & EIA Regulations, 2000 for filling, review and approval of environmental assessments, the project is categorized in the category B (Power generation less than 200 MW) of Schedule-I for IEE, of PEPA, Regulations, 2000, requiring Initial Environmental Examination (IEE). This section of the study renders a detailed account of the project and its salient features, such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & materials etc. have also been examined as a response to possible environmental concerns.

2.2 Vision and Mission of Jilani Group

To be a leading manufacturer of plastic packaging products which are environment friendly and to offer excellent value driven quality for our customers; and to accomplish this with an entrepreneurial culture that drives operational excellence and proactively creates sustainable products.

2.3 Objectives of Project

Objective of the project is to fulfill the requirement of energy by generation its own energy with the help of coal based power generation. The capacity of the project is 6.5 MW. Objective of project is to produce the energy from coal power project for its own use.





2.4 Alternatives considered

Alternatives are generally identified and analyzed to determine the most viable method of achieving the project objectives. During the recent years, environmental and social concerns are gaining significant momentum all over the world. Therefore; besides the technical and financial considerations, it is also required to recognize the environmental and social consequences of developmental activities.

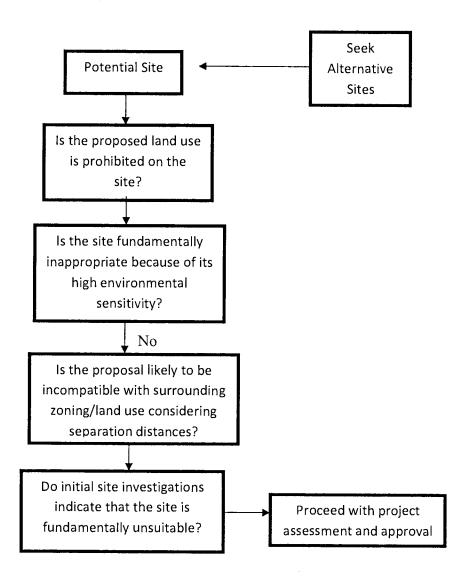


Figure 2.1: Site Selection Principles







2.4.1 Alternative I- No Project Option

A "no project option" (or "no development") simply implies no harm to environment and society. However, almost all types of economic development have some social and environmental benefits associated with it. Under the current power crisis in Pakistan, a "no project option" is considered to be the least viable option. Pakistan is currently facing a power deficit of about 4,000 to 6,000 MW. The proposed Project will contribute to reducing the existing power deficit. Thus in the absence of the proposed Project, the gap in power supply and demand will continue to grow at proposed site.

On the basis of above discussion, it can be concluded that unless a more economic and environment viable option can be found (which appears unlikely), the "no project option" will not considered for the project. It can be further concluded that the construction of proposed Project will have a worthy contribution in Jilani Companies.

2.4.2 Alternative II - Construction of Coal Power Plant at Approachable Location

Installation of proposed coal power plant for Jilani Companies is at approachable distance. The proposed project is located within the zone of industries and project location is ideal in the regard that it can supply the energy to Jilani Companies which are at arm length distance. The project location has been planned in the concern to provide the energy without spoiling any resource and nature object. Thus this alternate has been planned by keeping in view the provisions for energy and easily approachable site.

2.4.3 Alternative III- Power Generation Technology

The fuel prices and fuel cost/kWh is significantly less for coal based power plants when compared with other thermal power generation technologies (oil and gas). Average cost of electricity generation from coal power plants is also less than oil, gas and wind power plants.

2.4.4 Alternative IV – Transportation of coal to project site

The imported coal will be purchased from local vendors. The project is suitable also in regard that it is connected to Lahore by ring road and to Sheikhupura by Sheikhupura







road. Transportation of coal from local market will be carried out in easy mode and by easy access.

2.4.5 Alternative VI- Environment Friendly Aspects of Project

Sustainable Design: Though this alternative does not relate to identification of site, however, this is an equally important alternative which has been considered by the management of Jilani Companies. The coal power plant has more suitable site where energy can be transferred to the Jilani Companies easily. This point is suitable for the project as well as lead towards sustainability for its economy. Moreover there is no population between the radius of 5-6 km which is plus point for project as well. The site has adequate facilities for drainage, waste collection, communication, transportation, and electricity. These have been considered while selecting the choicest alternative. As for the design, different criteria were considered for finalization of a safe design. For this, a site where fundamental necessities are available will be feasible for project as well as will be good decision for project.

2.5 Location and Site Layout of the project

The project is located at 17 Km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. Project layout plan is attached herewith this report as annexure. Google earth view of project site is as following;







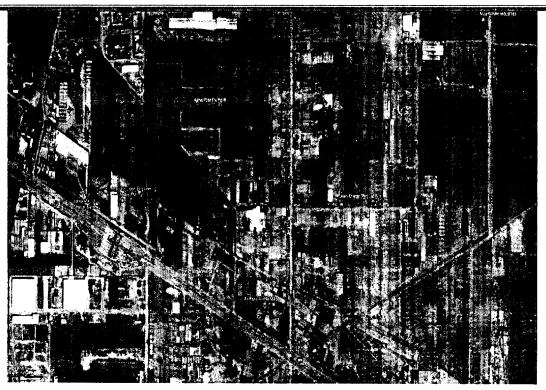


Figure 2.2: Google Map of the project site

2.6 Land use on the site

Propped project site is an open land yet while construction will be started after getting environmental approval.

2.7 Road access

The said project is 17 Km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. Said project has multiple accesses by road for the transportation of materials via ring road Lahore and Sheikhupura road.

2.8 Vegetation features of the site:

The project area is open land with little amount of scattered flora. It is about 5-10 trees. Some wild shrubs are presented in the study area. The few species are as follow:







Table 2.1: Native Vegetation

Sr. #	Trees Names	Scientific Names
1	Jand	Pterocarpus dalbergioides
2	Amaltas	Acassia Fistula
3	Kikar	bayahonda blanca
4	Puth kanda	Achyranthus aspera
5	Aak /Akra	Calotropis procera
6	Sumbul	Bombax malabaricum
7	Tahli	Dalbergia sissoo Roxb.
8	Sukh Chain	Pongamia pinnata
9	Nim	Azadirachta indica
10	Desi kikar	Acacia nilotica
11	Sufaida	Eucalyptus camaldulensis Dehnh

2.9 Cost and Magnitude of operation

The proposed coal power plant of Jilani Companies has a great scope regarding its power generation for Jilani Companies. All measures regarding health and safety and operation of plant are being taken carefully. The Management of Jilani Companies is committed to maintaining this quality policy at all levels of the company. The capital cost of project is approximately 0.919 Amount (USD'Million).





2.10 Schedule of implementation

The schedule for this project will be implemented which will work properly in environment sound conditions.

In implementation following activities are included;

- Lay out plan of project sites is available (attached herewith this IEE report).
- > There will be a complete hierarchy and management plan for the departments training plan

2.11 Description of the project (Process flow chart/steps)

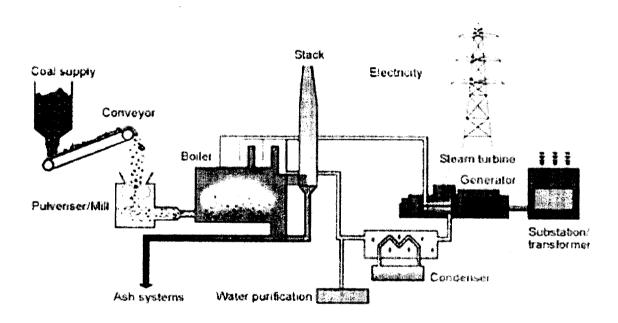


Figure 2.3 Process Flow Diagram



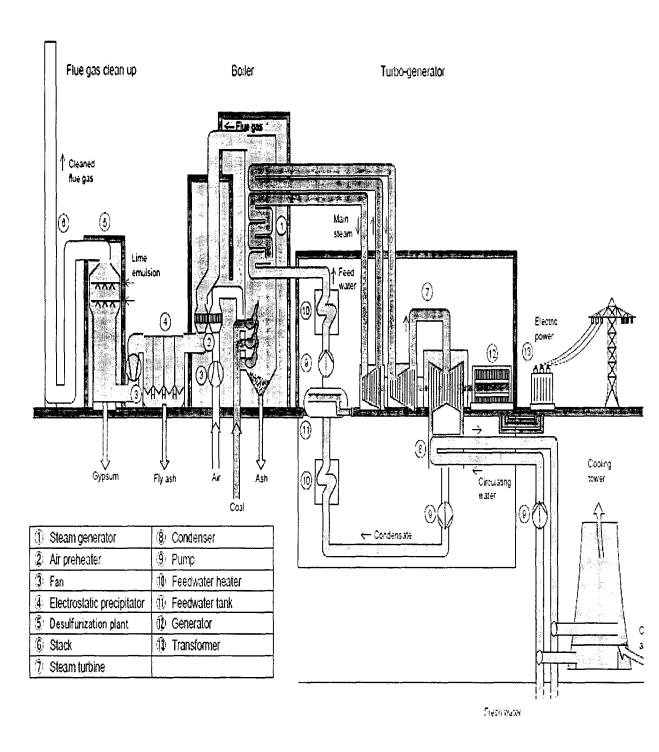




Plant configuration

- One Ultra-Supercritical (USC) system of a boiler, a turbine generator and auxiliaries
- Once-through boiler with Pulverized Coal (PC) firing
- Single reheat condensing, tandem-compound steam turbine
- Totally enclosed, three phase, 50Hz, synchronous generator
- Auxiliary plants; coal handling system, ash handling system, water treatment system









Design Scale

Design capacity of the power plant is 6.5MW, with 1 set of 35 t/h high temperature, high pressure CFB boiler, 1 set of 6.5MW condensing steam turbine equipped with I set of 6.5MW brushless excitation generator.

Interconnection Study

MW Jilani Coal Fired Power Plant to 11 kV bus bar of Javed processing unit have been modeled having its per unit (p.u) resistance, reactance and susceptance according to line length.

Design Scope

- Boiler System
- Turbine System
- Generator System
- Fuel Conveying System
- Limestone Injection into the Boiler
- Ash & Slag Handling System
- Chemical Water Treatment System
- Water Supply & Drainage System of Power Plant
- Firefighting System of Power Plant
- Electrical System
- Control & Instrumentation System
- Ventilation and Air Conditioning System
- Other Civil Works Matched with The Above System

Main Design Principle

1 set of High temperature and high pressure 35 TPH CFB boiler is set for this project during this phase, together with 1 set of 6.5MW extraction condensing STG unit. Turbine

Major .





is manufactured by Peter brotherhood (Rated power is 6.5 MW. Main steam inlet pressure is 6.6 MPa. Main steam inlet temperature is 470°C); Generator is supplied in matching model, Rated power is 6.5MW. Outgoing feeder voltage level is 11 kV. 1 set of CFB (circulating fluidization bed) boilers model has Rated capacity is 35 TPH. Steam pressure is 6.6 MPa. Steam temperature is 470°C.) Semi open layout is adopted.

Fuel Conveying System

The power plant is equipped with a set of dry coal shed with span of 30 m, and length of 60 m. Total area of dry coal shed is 1800 m², which can store up to 1000 tons, meeting 10-day coal demand of the power plant .Coal in dry coal shed is transported to coal belt conveyor by coal feeder below underground coal hopper and then sent back to raw coal bunker of main power building by belt conveyor after crushing. Single loop belt conveyor with belt width of 650 mm shall be used to transport coal of 4 Tons/hr to boiler. In accordance with the requirements of environmental protection, multi-cyclones is used for flue gas dust removal, whose dust removal efficiency is 85%. Internal limestone desulfurization system is adopted for the boiler. When calcium sulfur molar ratio is 2.5, the desulfurization efficiency can reach 85%.

Ash & Slag Disposal System

Ash and slag of boiler is utilized completely and comprehensively as raw material for brick and tile plant. Boiler slag is discharged to cooling slag remover and cooled dry slag is transferred to slag silo through large-inclination belt conveyor, then transported to cement plant or brick & tile plant by vehicles for comprehensive utilization.

Energy Conservation and Raw Material

After put into operation, the power plant can supply 6.5 x 8400 kWh power annually. Coal consumption for power generation is 622 gm/KWh, (based on client's supplied SGS coal analysis report, the GCV of coal is 5500 Kcal/kg, NCV of Pakistan local coal is 3500 Kcal/kg coal.

CFB boiler has high combustion efficiency (89%) and large load regulation scope. It still can burn stably without oil injection which can support combustion so as to save oil under







40% of low load. Limestone powder is added as desulfurization agent during operation of CFB boiler.

Due to the combustion conditions of low-temperature and segmented air supply in this furnace, the NOx generation is remarkably decreased.

Station auxiliary transformer of low losses is selected for this project to save energy consumption. Sufficient high-precision surveying instruments is furnished for electrical and steam-water systems according to regulations. Operation indicators is surveyed and checked reasonably to control economic operation of power plant effectively. Recycle and circulate drainage of industrial cooling water of main power building to save water consumption.

2.12 Water Requirement

The water requirement during construction phase will be fulfilled by the ground water and requirement of water will be 35-40 gallons per day including construction and domestic usage. The water required at Coal Power Plant will be used during process, at domestic level, and for green belts. For process the ground water quantity will be approximately 12-15 gallons per day while for domestic purpose water will be used about 8-10 gallons per day. Water requirement for maintenance of green belts is estimated 5 gallon per square foot per day. Thus approximately water requirement for the Jilani Coal Power Project will 30 gallons per day.

2.13 Wastewater Generation and Disposal

Wastewater generates from the proposed Coal Power Plant during cooling process and domestic wastewater. Collectively, estimated quantity is estimated for wastewater is 600 - 1000m^3 /day approximately. To get rid from domestic wastewater there will be proper septic tank system which link to nearest wastewater drain namely Messon drain. The wastewater from the process will be discharged after 3 to 4 days from the process to plantation or for sake of cleaning purposes etc.







2.14 Solid Waste Generation and Disposal

A solid waste management division will be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. To keep the plant site neat and tidy, a contract is awarded to a contractor who employs a work force of 05 sweepers to do the needful. Another contract will be awarded by Jilani Coal Power Plant for gardening purposes and a work force of 3 gardeners will be employed to maintain the lawns, grow flowers and plant trees.

2.15 Manpower Required

There are 20-25 employees who will work in the Coal Power Plant and will be engaged for different activities. Jilani Coal Power Plant provide them Health, Safety and Hygiene.

2.16 First Aid facility

At workplace workers and employers will have enough information, knowledge and training regarding first aid treatment in case of any emergency. The project will provide proper medical facilities to workers and staff to cope with any accidents and tackle them.

2.17 Safety Measures at Jilani Coal Power Plant

Through inspection processes, ensure Jilani Coal Power Plant facilities will be capable of producing the level of quality product required (Energy). Numerous dangers exist around and during the process which will be easily tackled by the team of Jilani Coal Power Plant. Communication is a key safety issue at process of power plant. Develop and distribute clear-cut guidelines dealing with organization's policy on safety. Every individual involved in the project should know what is expected and how to perform the assigned tasks. Proper training in the operation of a piece of equipment will be essential for its operators, for example. Retraining will be necessary at frequent intervals because the longer a person continues to perform the same task, day after day, the more likely he is to do things by habit and ignore surrounding events. In addition, all persons must be aware of OSHA guidelines, including the wearing of hard hats, safety glasses, and gloves. Safety talks are a good way to start the day. People need to be reminded that they are operating in a potentially dangerous environment, and daily talks are one way of







meeting this need. Further, if an unsafe work practice is noticed, corrective action should be taken immediately.

Jilani Coal Power Plant will have special management for Health & Safety concern issues. In this regard all safety measures will be discussed for implementation either they are regarding health or working. This department has special policy regarding Safety, Health & environment Policy Statement including:

- 1. to reduce overall emissions and contamination
- 2. to minimize waste, conserve natural and energy resources
- 3. to create awareness among the employees and surrounding community for protecting the environment
- 4. to achieve continual improvement in the prevention of environmental pollution by adopting suitable technology and practices
- 5. to reduce time loss by ensuring safe work practices

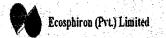
2.18 Restoration and rehabilitation plans

Land rehabilitation is the process of returning the land in a given area to some degree of its former state, after some process (industry, natural disasters, etc.) has resulted in its damage. The proposed Jilani Coal Power Plant will be installed where there is no population or any sensitive zone which will be demolished during installation of plant. Said project is open land which is feasible for the project. So by considering project from all aspects, it has been concluded that project is environment friendly from all aspects and no need for rehabilitation or restoration.

2.19 Government approvals

Jilani Coal Power Plant is going to apply in EPA, Punjab for Environmental approval of Coal Power Plant.







CHAPTER 3 STATUTARY REQUIREMENTS & STANDARDS





CHAPTER 3: ENVIRONMENTAL LEGISLATIVE, REGULATORY AND INSTITUTIONAL FRAMEWORK

3.1 General

Sustainable development and green economy is a concept that has emerged over the past decades to describe a new framework aimed at economic and social development while maintaining the long term integrity of the ecological system and environmental resources. The principal of sustainable development is in the process of being incorporated into the national policy and legislation through various statutory instruments. This chapter describes the current legal responsibilities of the proponent in context of environmental and sustainable development, and the institutions that exist in the country that may influence the environmental management of the project.

This section deals with the current policy as well as legal and administrative framework related to carrying out of Initial Environmental Examination (IEE) of the project. An efficient and effective organizational structure is essential for successful implementation of the mitigation measures identified for the project. Like other projects, the project, before its implementation, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection (Amendment) Act 2012.

3.2 Existing Legislation and Legal Framework

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This IEE study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).





3.3 Institutional Setup

3.3.1 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members. The purpose of IEE is basically to obtain Environmental Approval from the Environmental Protection Agency (EPA), Punjab in compliance with Pakistan Environmental Protection Act (PEPA) - 1997, now having been replaced by Punjab Environment Protection (Amendment) Act 2012.

3.3.2 Environmental Protection Agencies

Pak EPA has been established at the Federal level and EPAs are established at Provincial level also. In Punjab an independent Environmental Protection Agency is constituted headed by the Director General.

3.3.3 Environment Protection Department, Punjab

The Punjab Government has established Environment Protection Department (EPD) administratively controlled by the Secretary, Government of Punjab. The EPD has its independent Minister. According to the provisions of the Punjab Environmental Protection (Amendment) Act, 2012, EPD has a significant role in policy making and implementation of the environmental laws in the Punjab Province.

3.3.4 Relevant Legal / Institutional Framework

The applicable laws for the environmental study of the project are briefly given below. The proponent of the project will abide by the applicable laws and regulations.

A number of laws have been promulgated by the Government of the Pakistan to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997,

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through an Act of Parliament. According to the 18th Amendment in Constitution, the PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Under the PEP Act, it is mandatory to carry out IEE or EIA for all development projects. The Pak EPA has also framed guidelines for environmental assessment of projects in various developmental sectors, According to PEPA 1997; the National Environmental Quality Standards (PEQS) were established for effluents discharges and gaseous emissions of various Municipal and Industrial sources. The latest revision of PEQS as carried out in year 2016.

Provincial Environmental Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has received some weight during the recent past, strict implementation of the NEQS is still a dream to be realized. The applicable laws for the environmental study of the Project are briefly described below:

3.4 Pakistan Environmental Protection Order (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

3.5 Punjab Environmental Protection (Amendment) Act 2012

Section 12 of the Punjab Environmental Protection (Amendment) Act 2012 makes it mandatory for the proponent of a project to file with the Environmental Protection Agency either an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), as the case may be, in respect of the project.







As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Initial Environmental Examination (IEE) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory, and compensatory measures, formulation of environmental management & training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated "as it is" in the new Punjab Environmental Protection (Amendment) Act, 2012.

3.6 National Environmental Policy 2005

Government of Pakistan has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts.

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

3.7 Review of IEE / EIA Regulations 2000

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts.







Projects type listed in Schedule I are designated as potentially less adverse effect, schedule I projects require an IEE and projects given in schedule II require EIA to be conducted.

Salient features of the Regulations are listed below:

- Categories of project requiring IEE and EIA are issued through two schedules attached with the regulations
- A fee depending on the cost of the project has been imposed for the review of IEE and EIA.
- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The IEE / EIA approval for construction of the project will be valid for three years from date of accord.

3.8 Guidelines for the Preparation of IEE/EIA Reports

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors.

3.9 The Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. There are not withstanding any specific provisions, every local government may perform functions conferred by or under the Punjab Local Government Ordinance, 2001, and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.







3.10 Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger of annoyance to the public or the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right".

3.11 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

Although quite old, this act laid out the legal basis for any property affected by a project and for compensating the effected owners of the land.

3.12 Factories Act, 1934

The clauses relevant to the project are those that concern the health, safety, and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulations for handling and disposal of toxic and hazardous materials. Given that construction activity is classified as 'industry', these regulations will be applicable to the project contractors.

3.13 Labor Laws

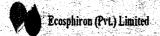
Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors to follow the relevant labor







laws and rules relating to safety of the workforce and creating a healthy working environment. The proponents shall ensure that the labor force engaged at the project site is not exposed to any danger by monitoring the contractor's work frequently.





CHAPTER 4 DESCRIPTION OF THE ENVIRONMENT





CHAPTER IV: BASELINE DATA & ENVIRONMENTAL PROFILE

4.1 GENERAL

The existing environment around the site of project has been studied with respect to physical, ecological and socio-economic resources. The existing information to establish a database for the IEE of the project was collected from different departments, review of previous studies and through the site visits carried in out in the project area.

4.2 PHYSICAL ENVIRONMENT

The study examines the physical resources, topography, soil, climate, surface and ground water and geology of not only the project site but also the city as whole to assess whether the project under review can or does impact on any of these parameters. The description of physical environment of Sheikhupura city and the project site is present in the following sub sections.

4.3 Geological Formation

The soil of the Sheikhupura belongs to the typical alluvium of the Indo-Gangetic plains. The majority of the soils are loamy or sandy loam consisting of soil crust of different depths. Hardly any profile characteristics are observed; soluble soils are present in considerable amounts. The lower layer consists of kankar nodules. The soils have generally an alkaline reaction and are adequately supplied by phosphorus and potash, but are deficient in organic matter and nitrogen.

Geologically the alluvium is divided into khaddar, i.e., the newer alluvium of sandy generally light colored and of less concretionary composition; and Bhangar, i.e., the older alluvium of the more clayey composition, generally of dark appearance and full of kankar.







The soil differs in consistency from drift sand to loam and from fin silt to stiff clay. A few occasional pebble beds are also present. Layers of kankar in the Indo-Gangetic alluvium of the district are also observed.

4.4 Climate

The Climate of Sheikhupura is tropical. It is very healthy and salubrious. Except of few months of summer, Sheikhupura is a suitable place to live. The people of Sheikhupura have to experience extremes of temperature. The summers are really hot and the winters are very cold. There are three main seasons in Sheikhupura, namely, summer, winter and rainy season. During the summers Sheikhupura experiences heat waves.

Table 4.1: Seasons in Sheikhupura

Weather	Months
Autumn	1 Oct – 15 Nov
Winter	15 Nov – 15 Feb
Spring ·	15 Feb – 1 Apr
Summer	1 Apr – 30 Sep
Monsoon	July – Sep

4.5 Temperature

Sheikhupura weather is hot and humid. The city experiences an extreme climate during the months of May, June and July, when the city witnesses summer season. The temperature in Sheikhupura ranges between 40°C to 45°C, during the summer months. Sheikhupura experiences winters during the months of December, January and February.





The temperature during this season varies between 5°C to 8°C. Given below are the maximum and minimum temperatures of Sheikhupura throughout the year:

4.6 Rainfall

Sheikhupura has a distinct rainy season, during which the weather is very humid. The rainiest months of the year are July and August, with June and September also gets some rain. During the rest of the year, barely any rain falls in Sheikhupura.

4.7 Topography

The city of Sheikhupura is bound by Sheikhupura district in the west and by Wagah on the east, while on south it is surrounded by the Kasur district. On the northern side, it is watered by the Ravi River. The city occupies around 404 square kilometers of land and is still expanding.

4.8 Wind Direction

The Sheikhupura region experiences westerly and north westerly winds during the winter and spring seasons, known usually as the dry stable times of year and southerly and south easterly winds during summer and monsoons. Wind speeds are low during winter picking up during spring season and peaking during the summer months.

4.9 Ambient Air Quality

Atmospheric pollution particularly in urban area has a strong impact upon daily life. Sheikhupura is the second largest city of Pakistan. Its economic growth and rising energy consumption are causing the increase in air pollution. The main sources of the air pollution are motor vehicles and industrial activities. SO2, NO2, CO2, CO, O3 and Particulate Matter (PM) are investigated as the pollution indicators.

The overall air quality in the study area is of moderate nature. Dust particles along with oxides of nitrogen, sulphur and carbon are the major causes of air pollution in the ambient air quality.





It was however observed during the visit that environment of the project area is clean as the area is far away from the city center. Results of tests conducted to assess ambient air quality of the project area are given in annexures of the report.

4.10 Water Resources

• Surface Water

There is no fresh surface water resource like canal or ponds, near the project area.

Ground Water

The city of Sheikhupura is underlain by the deep permeable aquifer formed within the alluvial plain of the Ravi River, which is the part of Greater Indus Plain.

Groundwater is the principal source of municipal water supply in Sheikhupura. This is also the case in the immediate vicinity of the site. The City's drinking water is obtained from groundwater aquifer by means of tube wells located throughout the area. Groundwater is pumped from 400-800 feet and is generally good for direct consumption. About 83% of the city's population is consuming groundwater for drinking purposes. Results conducted to assess the groundwater quality in the area in context of six parameters of concern for drinking water have been annexed with this report.

4.11 Drinking Water Quality

WASA (Water and Sanitation Agency Sheikhupura) is providing drinking water to the residents of Sheikhupura. WASA claims the quality of water conform to the Drinking Water Standards.

The increase in population will have direct impact on the water sector for meeting the domestic, industrial and agricultural needs. Pakistan has now essentially exhausted its available water resources and is on the verge of becoming a water deficit country. The quality of water supplies in many cities of Pakistan is deteriorating fast. Over pumping of groundwater due to extended drought has affected the water quality adversely.







4.12 Noise Level

Sheikhupura city of Pakistan has population around ten million. There are many a large, medium and small industries which are still working within city premises. Industrial activity and vehicular emissions are causing excessive noise in the city.

The affluent areas of Sheikhupura are quieter than rest of the city; the noise level in these areas is still far higher than the standards set by the World Health Organization and the Pak-EPA. Noise pollution in the city is on the rise with most residents complaining that the noise is becoming a public nuisance.

4.13 ECOLOGICAL ENVIRONMENT

Sheikhupura is enriched with the presence of natural flora and fauna, although with the growing population and development activities, the presence of the same has been somewhat affected. There are no significant or well-shaped trees and shrubs on the project site as the site is located in plane land within the premises of unit.

4.13.1 Flora

Trees, also called the 'lungs' of the earth, are important for the restoration of the ecosystem. People can benefit immensely from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds. Several species of the trees in Sheikhupura are being used in medicine and provide excess raw material for Indian ayurvedics. Trees such as Neem, Bhaira, Harrar, Dhair and Moosri have great medicinal value and can be grown easily in the city.

No trees are found in the vicinity of the project area. Therefore there is no adverse impact on the flora. There is no Reserve Forest in the 5 km radius. No threatened or endangered species and no medicinal plants are present in the project area.







Table 4.2 Inventory of Flora of Sheikhupura

S.no	Common Name	Scientife Name:
1	Indian Lilac	Azadirachta indicaL.
2	Chinese date	Ziziphus mauritiana Lamk
3	Yellow	Terminalia chebula Retz.
4	Temple plant	Crataeva adansonii DC.
5	Bombax	Bombax ceiba Linn.
6	Bistula	Cassia fistula Linn.
7	India laburnum	Acacia nilotica (Linn.)Delile.
8	Indian banyan	Ficus benghalensis Linn.
9	Buddha tree	Ficus religiosa Linn.
10	Benzoil tree	Moringa oleifera Lam.
11	Devil tree	Alstonia scholaris(L.) R.Br.
12	Rosewood	Dalbergia sissoo Roxb.
13	Mango	Mangifera indica L.
14	Spanish cherry	Mimusops elengi L.
15	Jujube	Ziziphus zizyphusMill.





4.13.2 Fauna

With an increase in the rate of urbanization, the ecology of Sheikhupura has been considerably affected and population of birds in Sheikhupura has reduced to just 85 including the resident and migratory ones.

Some birds and few animals like Buffaloes, cows, goats, donkeys, hen, rats, cats, dogs are present in the vicinity. Some reptiles like lizards are also present. The only amphibian seen the project area is frog. No threatened or endangered species are found in the project site. Similarly no wildlife is present.

Table 4.3 Inventory of Fauna of Sheikhupura

* * *		Scientific Name
1	Intermediate Egret	Egretta intermedia
2	Indian-Pond Heron	Ardeola grayii
3	Red-Wattled Lapwing	Hoplopterus indicus
4	Common Sandpiper	Actitis hypoleucos
5	White Wagtail	Motacilla alba
6	Yellow Wagtail	Motacilla flava
7	Red-vented Bulbul	Pycnonotus cafer
8	House Sparrow	Passer domesticus
9	Common Myna	Acridotheres tristis
10	Bank Myna	Acridotheres ginginianus
11	Pied Myna	Sturnus contra





12	House Crow	Corvus splendens
13	Nectarinia asiatica	Purple sunbird
		Dicrurus macrocersus
14	Black Drongo	vieillot
15	Black kite	Milvus migrans migrans
16	Blue rocky pigeon	Columba livia
17	Little brown dove	Streptopelia senegalensis
	White-breasted	
18	Kingfisher	Halcyon smyrnensis
19	Little Green Bee eater	Merops orientalis
	Golden-backed	
20	woodpecker	Dinopium benghalense
21	Ноорое	Upopa epops
22	Pheasant-tailed jacana	Hydrophasianus chirurgus

4.14 SOCIO ECONOMIC ASSESSMENT

Social change is the consequence of almost any intrusion into the community life of any society. The intrusion can be in the form of any developmental projects or nonspecific, less tangible forms such as increased exposure to other cultures, technological changes and so on. The social change that results from intrusion into community life can also be beneficial, but can have undesirable or negative outcomes. Even that change in the long run may have positive effect on the social well-being of a community.







Social Impact Assessment is a methodology used for examining social change due to external sources, especially specific developmental projects, but also government policies, technological changes and social processes or anything that has a social impact.

The objectives of the given study are outlined as follow:

- To carry out the assessment of social impact.
- Acquire socioeconomic data to evaluate and identify the project interventions.
- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures and solutions to improve socio economic conditions.
- To analyze socio economic conditions of community, with special reference to environment and conservation of natural resources

4.14.1 Study Population

The target population was comprised of workers around the project site which were of Sheikhupura District. Therefore, approximately a total of 10 workers of different socio-economic conditions were surveyed. Data collection tool was questionnaire; it was a 10-items based semi structured questionnaire.

4.14.2 Description of Tables:

In the following table, only frequency and percentage has been measured (by SPSS) of those parameters which are probably present in maximum quantity.







Table 4.4: Socioeconomic Questionnaire

Sr. #	Variables	Frequency	Percent (%)
1	Name & Address	-	-
2	Date	-	-
3	Address & CNIC	-	-
4	Age	89 (above 30 years)	89%
5	Education	93 (under metric)	92.8
6	Occupation	96 (Private jobs)	95.9
7	Marital Status	99 (married)	99
8	If married then no. of children	87 (> 4)	86.7
9	Total Family members	90 (< 5)	90
11	No. of earning members in family	88 (< 3)	88
12	Total income	97 (> 25 PKR)	96.3
13	Source of income	99 (Private jobs)	99

Respondent View about Project

Respondent Views

- 🛍 Respondent View for Project (100 in favour)











4.15 Demographic Profile of Sheikhupura

Sheikhupura comprises a large number of Pakistanis along with some foreign nationals. Demography of Sheikhupura is spread over an area of 1,014 square kilometers. Average household size in 1998 was recorded as 7.12. In 1998, the total number of male population was estimated to be 48 % and female population to be 52 %. According to the 1998 census, Sheikhupura's population was nearly 6.8 million. Mid-2006 government estimates put the population at somewhere around 10 million, which makes it the second largest city in Pakistan, after Karachi It is considered to be one of the 30 largest cities of the world. The second largest city in the country was ranked the second most literate district in Punjab with a literacy rate of 64.7 percent. Urdu, which is the official language of Sheikhupura, is mostly used in the city. However, the people in Sheikhupura also use other languages like English, Punjabi and Pashto. It is noteworthy that Pakistan is an Aslamic country, where the majority of the population is Muslim. Sheikhupura, being a city in Pakistan, could not be an exception to this. As a result, 96% of the total population in Sheikhupura is Muslim. Other religions in the city accounting for the rest 4% are Christianity, Hinduism and Sikhism.

4.16 Health facilities

The city of Sheikhupura in Punjab Province of Pakistan is served by a number of private and government hospitals offering world class medical facilities. The rural and urban areas are served by various other medical centers and dispensaries offering modern medical facilities. The hospitals, dispensaries and medical centers in Sheikhupura aim to provide the citizens best medical facilities and prevention from contagious and other harmful diseases. There is no health facility or any dispensary near the project area.

4.17 Educational Facilities

Sheikhupura is known as Pakistan's education capital, with more colleges and universities than any other city in the country. Sheikhupura is Pakistan's largest producer of professionals in the fields of science, technology, IT, engineering, medicine, nuclear sciences, pharmacology, telecommunication, biotechnology and microelectronics. The







current literacy rate of Sheikhupura is 64%. No educational facility is present in the vicinity of the project area.

4.18 Transportation and Communication

Sheikhupura is one of the most accessible cities of Pakistan and the only unique city of Pakistan where you can find Public and private Transport, 24 hrs a day and 7 days in a week.

Public transport is always available in the project area. To fulfill the remaining needs of transport there are thousands of rickshaws and taxis which run on compressed natural gas to reduce pollution in the city and of course about 75 percent of the residents have their own conveyances.

4.19 Industrial Activities

Sheikhupura trade and industries thrives on certain large-scale industries such as steel, textile, carpet and IT industries. Sheikhupura is known as the industrial belt of Pakistan contributing the largest share in the GDP of the country. The city is home to 20% of Pakistan's industrial producers; manufactures include textiles, rubber, iron, and steel. Handicrafts, especially gold and silver work, also flourish.

The proposed project area is also present in a plain area and is surrounded by mostly industries and little agricultural land.

4.20 Water Supply

At the project site, the water requirement will be fulfilled by the ground water.

4.21 Telephone Facilities

Landline and Cellular telephone facilities are not present in the project area.

4.22 QUALITY OF LIFE VALUES

No residential area is present near the project site; therefore, individuals and workers from neighboring areas were interviewed. The individual assessed from the neighboring communities of the project area were involved in small businesses and private jobs in





nearby industries. Most of the people hesitated telling their incomes; however, incomes average in the range of 20000 to as much as 100000 PKR; enough to meet their basic needs. They avail all the basic facilities of healthy living and enjoy human rights and civic liberties.

The diseases prevalent in the community were stomach disorders, fatigue, joint pain, diabetes and arthritis. But it was also observed that all these disease are commonly due to improper diet and water contamination.

Almost all of the interviewed members were in favor of the project rather they commented even more similar projects should be initiated in such areas as to yield lowering of goods prices and controlling inflation when not comprising on quality of the products and the environment.

4.23 LAB REPORTS

4.23.1 Ambient Air Quality Monitoring

Ambient Air Quality was monitored for the parameters according to Punjab Environmental Quality Standards (PEQS) 2016 i.e. Carbon Monoxide (CO), Sulphur Dioxide (SO₂), Nitrogen Oxide (NO), Nitrogen Dioxide (NO₂) and Particulate Matters (PM₁₀), Ozone (O₃), Carbon Dioxide (CO₂), Volatile Organic Compounds (VOC's), Humidity (%), Suspended Particulate Matters (SPM) and Humidity of ambient air at proposed site of 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. This monitoring is carried out under standard time of monitoring i.e. 24 hrs. Monitoring reports are attached herewith Annexure

4.23.2 Ground Water Analysis

Ground water analysis was done for the parameters according to Punjab Environmental Quality Standards (PEQS) 2016 i.e. Alkalinity, Calcium, Carbonates, Total Coliform, Conductivity, Hardness as CaCO₃, Magnesium, Odor, pH, Sulfate, Sodium, Taste, Turbidity, Nitrogen/Nitrates, Lead and Mercury of the water samples collected from the proposed site of 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. Results obtained by Laboratory are attached herewith Annexure.





4.23.3 Noise Monitoring

Monitoring of was done according to Punjab Environmental Quality Standards (PEQS) 2016 for proposed site of 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. Results obtained by Laboratory are attached herewith Annexure.

4.24 Conclusion

The gathered and assessed data produces the conclusion that commencement of the project will prove to be beneficial for the workers of the area. The project will provide job opportunities for the local inhabitants.

The project, overall, does not have major adverse impacts on the existing environment and people with due implantation of the mitigation measures. It is further concluded that project confirms to the local environment.



CHAPTER 5 POTENTIAL ENVIRONMENTAL IMPACTS NAD MITIGATIONS





CHAPTER 5: SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 General

The potential environmental impacts related to the project have been studied in context of installation of Jilani Coal Power Plant during construction as well as during operational stages of the Project located at 17 KM Sheikhupura Road, Sowa Messon, Kaller, Sheikhupura. Environmental protection measures are recommended to eliminate adverse impacts on environment or to reduce them to an acceptable level within the prevailing legislative and regulatory framework. These Impacts are evaluated on the basis of magnitude, immediacy and sustainability. A careful consideration of project aspect, their potential environmental impacts and mitigation measures are proposed in this chapter. Evaluation criteria are as follow:

- Magnitude: Type of impact (direct, indirect, and cumulative)
- Immediacy: Temporal extent (during installation of plant, after installation of plant/ operational phase)
- Spatial extent (local, widespread)
- Sustainability and Reversibility:
- Mitigability (fully, partially)
- Monitoring (fully, partially)

5.2 Environmental Problems Due to Project Location

Jilani Plastic is a group of companies established in 1970 and has been operating as a leading plastic packaging products manufacturer in Pakistan. Now considering the scenario of energy, Jilani Group has decided to produce its own power supply so that burdens in national level may reduce at much extent. All measures were in favor of project then it came to operational. All that measures are adopted and never compromised with measures either they are health or environment related. A detailed explanation of each potential impact is given hereunder in tabulated form:







Table 5.1: Environmental Problems/Mitigation Measures Due to Project Location

POTENTIAL IMPACTS

MITIGATION MEASURES

Change in Land Use Pattern

Any new intervention has its first and foremost impact of changing the land use pattern of the area. The impact of this nature is irreversible therefore site selection needs to have careful consideration of the impacts that may arise due to the changes in land use patterns.

Prior to selection of site, the project proponent had careful consideration of site alternatives hence due to current land use nature, price, comparatively less environmental impacts the was selected. Another factor adding to the feasibi of the plant site is that it is located in the lease a There is no population in the 5-6km radius and sensitive zone and structure.

By considering all impacts it has been concluded project is environment friendly and good economic growth which will reduce the ene burden on national grid.

Pressure of Resources

Yet another impact to be considered prior to site identification is the availability of already existing resources e.g. water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.

Considering this very important factor, the identification was done after evaluating the exten provision of resources. The water requireme energy requirement, social services (identified in previous chapters) was done and based on availability of resources to meet the present future demand, the mentioned site was identified.





Natural Hazards

It is very important to assess the extent of damage any natural hazard e.g. earthquake, floods, landslides may cause. The geological formation of the capital territory is such that it has been categorized into earthquake zones.

The proposed site identified within environment /geologically safe and does not fall in any of earthquake zones in which the capital territory divided.

Displacement of Local Community

Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.

The project is planned on a site which has alre been acquired by the proponent after going thro socio-culture, environmental and econo considerations. The land falls under industrial z hence does require not local commu displacement.

Accessibility Issues to the Local Community

Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.

The project site is located within the industrial z and it from all sides and does not involve damage any roads. Nature, size and scope of work also li the extent of activities during installation of c plant as well as during operational phase.

Presence of Sensitive Areas

Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.

There are not sensitive ecological, social or historiareas around the site.

Availability of Existing Infrastructure and Services

Unavailability of infrastructure can render the | The project is well connected to the cities of Lah







easily. So
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is conside
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5.3 Environmental Problems Associated With Installation of Jilani Coal Power Plant

Table 5.2 provides a detailed overview of the environmental aspects and subsequent environmental impacts that may arise during installation and project operational phase. Appropriate mitigation measures are also proposed for the remedy of any such potential impacts.

Table 5.2: Environmental Impacts/Mitigation Measures during Construction phase

	POTENTIAL IMPACTS	MITIGATION MEASURES
	CONSTRUCTION PHASE / INSTALLATION OF COAL POWER PLANT	
1.	Solid Waste Management	
	Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the entire system.	Solid waste during installation of coal power plant will be only rod pieces, wrappers, mud or stone etc. the mud and stone material will be reused for filling the soil and rod pieces etc will be back to contractors. This division will be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel. To keep the plant site neat and tidy, a contract is awarded to a

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	the latest playing and the control of the control o	contractor who employs a work force of 5
:		sweepers to do the needful.
2.	Wastewater Disposal	
	Wastewater generated due to	Wastewater generation during installation
	domestic/process activities result in the spread	of coal power plant will be domestic. For
	of vector borne diseases like dengue, malaria,	this purpose workers will use nearby
	as well as spread the nuisance of foul smell.	washrooms like of Masjid.
3.	Energy Conservation	
	Excessive use of energy exerts more pressure	The workers/employees are encouraged to
	on the already dwindling energy resources of	follow energy conservation strategies
	the city/country.	during installation of coal power plant.
	·	Machineries and equipment are kept in
		good maintained shape to avoid extra fuel
		consumption.
4.	Noise Generation	
	Noise emissions due to traffic and any	Any activity that leads to noise pollution
	activities create issues to the workers.	is restricted. Machinery will be fully
		grouted and fixed so that element of noise
		pollution reduces at negligible level. The
		construction activities will be restricted at
		day time only so that at night noise
		pollution cannot cause any trouble for
		anyone.
5.	· Tree Cutting	<u> </u>
	Cutting of fauna is serious issue because it	Project site has no any sort of tree
	absorbs the pollution and provides the fresh	plantation meanwhile wild bushes at some



	air.	extent were observed during ecological
		survey. However proponent is committed
		to plant 1000 plants during operation of
		project. These plants will be native plants
		and will have maximum capacity to
		absorb pollution and has maximum
		tolerance index.
7.	Training of Staff	
	Unskilled persons are not able to tackle	Regular training of the staff will be
	environmental, health and safety related	conducted. Proper monitoring and
	situations which may further aggravate any	reporting mechanism will be developed
	such issues and cause loss of human life and	where the team will be responsible to
	property.	communicate/report any illegal or
	·	hazardous situation to the team leader.
8.	Water Consumption	
	•	
	Excessive water consumption for the	An effective 'Water Conservation Plan'
	domestic and other activities during	will be developed and for domestic
	construction phase/ installation of Coal Power	purpose as well as for construction
	Plant may cause wastage of water in	activities. Following construction phase
	Industrial area where water has great value.	measures will be adopted for water
		conservation:
		• It should be ensured that all faucets,
		circulating pumps etc. do not leak and
		are in good repair;
		Any leaking or dripping faucet, pump
		or toilet report immediately;
		Purchase and use of water-saving

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		equipment also practice;
		An effective residents' training
		program is implemented about water
		conservation.
9.	Social Impacts	
	Problems regarding privacy of local	Though the chance of any improper social
	community may arise due to invasion of	conduct will be negligible due to the fact
	outside population.	that the project is within the industrial
		area. However, having a proactive
		approach, improper social behaviors e.g.
		staring and teasing will be discouraged
		and any such incident report directly to the
		site in-charge. Workers will have hired
		from the local community to avoid social
		issues.
10	Transportation	
	Transportation of raw material for safety stuff	Transportation vehicles will keep &
	manufacturing to and from the project site	maintain in good conditions to avoid the
	creates a probability of accidental spills and	chances of accidents.
	fire.	
		There will be a proper mechanical
		department where maintenance of
		machinery and vehicles will be monitored
		regularly.





Table 5.3: Environmental Impacts/Mitigation Measures during Operational phase

	POTENTIAL IMPACTS	MITIGATION MEASURES
	OPERA	TIONAL PHASE
1	Air quality	
	Plant emission will deteriorate the environment as coal power plant emits the greenhouse gases.	Following devices will be used during operational phase of Jilani Coal Power Plant Particulate matter control: Electrostat precipitator (ESP) with 99.7% efficie Sulfur dioxide (SO2) control: Flue Gar Desulfurization (FGD) with 80% efficiency Nitrogen oxides (NOx): Low NOx fir technology in the boiler Tree plantation will be done around the Jilani Coal Power Plant approximatel 1000 plants to make the environment friendly
2	Solid waste	
	Improper management of solid waste will cause the piles at the plant which will make the health hazards.	During operation, only domestic waste will generated at the plant which will comprise wrappers, papers etc. which will be managed SW manager at the plant.





3	3 Traffic	
•	Mismanagement of traffic at the plant will cause the disturbance as well as the noise pollution.	There will be adopting on-site traffic control measures.
	ponution.	Limiting truck movements to off-peak hours will be considered.
4	Noise	
5	Machinery and production noise of the process will may cause the noise pollution at the project site if it will not managed properly. Soil quality	Following measures can control the noise pollution at the project site; Controlling air-flow generated noise ladopting adequate sizing of inlet/outled ducts Installing noise barriers around air blowers, pumps, and generators to reduce noise impacts at nearby recept Operating well-maintained mechanical equipment on-site
	Spillage of vehicles can deteriorate the soil quality if will not managed properly.	Following mitigation measures can control the soil quality to deteriorate; Properly storing chemicals and fuels of site Developing procedures for emergency clean-up of spilled fuel
6	Terrestrial biodiversity	
	Development should not disturb the biodiversity because biodiversity are the	Following measures will be adopted in favor





	precious elements of the area.	biodiversity of that area.
		 Adopting a vegetation program that u indigenous stocks of local vegetation Proponent is committed to plant 2000 during operation of coal power plant.
7	Resource use	
•	Unbalance use of resources will not sustain	Following measures will be adopted for
	the resources.	resources utilization;
8	Health and safety	 Implement a power consumption and Adopting computer aided depender evaluation and preparation technic that can be used to plan for optimal of resources Using closed loop water reconsystems as well as providing provision for the collection and use of resources
		Fallering Winds
	Health and safety parameters are the key necessities of the any project especially cement plant which light mistake can have damage.	 Following mitigation measures will be adopt Enforcing site security Ensuring site safety Enhancing safety at site facilities Establishing environmental controls Regulating transportation on-site
9	Emergency preparedness plan	Regulating transportation on-site





	Emergency properness plan is fundamental	For emergency preparedness plan there wil
	factor of any project site so that in case of any	fire hydrants and fire extinguishers at cer
	emergency conditions can be tackled.	points. Meanwhile water tank will be available
		at every time for sake of any emerge
		condition.
		Condition.
10	Landscape and visual intrusions	
	Maintenance of landscaping and visual	Following measures should be followed
	intrusion at the site should be managed and	landscaping and visual management;
	without taking measures, incidents can be happen and workers can feel uncomfortable	Avoiding on-site storage of wastes equipment
		 Prohibiting heavy equipment
		transport vehicles from parking out
		the fenced boundary of the facility
		 Selecting appropriate paint colors for
		exterior of the buildings to help the
	·	blend with the surrounding
11	Socioeconomic	
	Socioeconomic factor comes in priority	By reducing socioeconomic problem following
	parameters because it's about surrounding	measures should be adopted;
	people income.	• ′
		Reducing potential exposure to
		emissions, especially dust

The impact associated and their risk score was calculated for each impact type to get an overall probability of severe impact that the project might cause during any stage of its







existence. The stages have been categorized according to the guidelines and the Risk Analysis Matrix method has been employed to obtain the overall impact in terms of probability, likelihood, severity and overall magnitude of impact.

Table 5.4: Potential Impacts

D. 4 4 1 T 4	Magnitude	
Potential Impacts	Without EMP	With an EMP
Air quality		-/0
Waste generation		-/0
Traffic		-
Noise		-
Surface and water quality		-/0
Soil quality		-/0
Terrestrial biodiversity	/+	-/++
Resource use .		-
Health and safety		-/+
Landscaping and visual inspection		-/+
Socioeconomic	-/+++	-/+++

+++ High Potential Positive Impacts

- ++ moderate potential positive impact
- + low potential positive impact

- high potential negative impact

-- moderate potential negative impact

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- low potential negative impact
- 0 Neutral impacts





5.4 Potential Environmental Enhancement Measures

In order to enhance the environment the following measures will be adopted:

- 1. Trees will be planted within the premises to beauty the surrounding area.
- 2. A special budget of 50,000 PKR will be designated for the environmental improvement of the environment on annual basis. The administration is responsible for spending of this budget. The team leader prepares the inventory of environmental improvement activities and communicates it with the rest of the team for implementation.
- 3. There will be medical facilities available for workers of Jilani Coal Power Plant.

5.5 Additional Considerations

It is very importance to plan a project after evaluating its cumulative socioenvironment and cultural impacts. The project is a unique venture in the identified locality as it will address the environmental, social and safety issues through its already established norms of operating within the area. The project is planned after keeping all the parameters of environment, health and safety for site identification, design, installation and operational phase. That's why the cumulative impacts of the project will be negligible.







CHAPTER 6 ENVIRONENTAL MANAGEMENT PLAN

IEE Report for Proposed 6.5 MW Jilani Coal Power Plant, Shelkhupura





CHAPTER 6: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

6.1 Background:

The purpose of developing this Environmental Management and Monitoring Plan (EMMP) is to provide a dynamic guideline to the concerned stakeholders to define details of who, what, where and when environmental management and mitigation measures are to be implemented besides providing the contractors and proponents better on-site environmental management control over the life of the project. The scope of this Environmental Management and Monitoring Plan includes the activities during installation and operation of Jilani Coal Power Plant at 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. However, to ensure the compatibility of the Environmental Management and Monitoring plan in accordance with the changing socio-cultural, economic and environmental factors, it would be used as a dynamic tool which means that the EMMP would undergo necessary modifications to keep catering to the changing environmental needs of the project.

Table 6.1: Users of EMMP

Sr.	EMMP .	End Users
#	Elements	
1	Background	All stakeholders – internal and external
		Jilani Coal Power Plant Management
		Approval or consent authority e.g. EPA Punjab
2	Environmental	The management and supervisory staff of proposed Jilani
	Management	Coal Power Plant
		EPA Punjab





3	Implementation	The management and supervisory staff of Jilani Coal
		Power Plant
	·	EPA Punjab
4	Monitor and review	The management and supervisory staff of Jilani Coal Power Plant and EPA Punjab

6.2 EMMP Context:

Being an environment conscious and law abiding entity, Jilani Coal Power Plant Management has decided to identify, develop and implement an EMMP that identifies the environmental aspects of their project besides providing them a guideline to tackle any environmental issues that may arise in the future. Under the Punjab Environmental Protection Act, 1997 (Amended, 2012), conducting an IEE/EIA prior to commencement of a project is obligatory. This is further reinforced through the IEE/EIA Rules 2000. A more elaborated guideline for Environmental Report Writing further provides a step by step procedure for drafting of an IEE/EIA report. An Environmental Management and Monitoring Plan have been made a compulsory part of the IEE/EIA report under the same guidelines. It is for this reason that proposed Jilani Coal Power Plant has planned to meet pre-requisite of the Environmental Approval by drafting a meticulously planned EMMP.

6.3 EMMP Objective:

The objectives underlying the EMMP of proposed Jilani Coal Power Plant are:

- 1. To provide guideline to the management and supervisory staff for conducting their activities in an environmentally responsible manner
- 2. To mitigate potential risks during installation/ construction phase and operational phase of the project
- 3. To coordinate with the responsible approval authorities regarding the environmental efforts
- 4. To identify roles and responsibilities for the implementation of EMMP





5. To meet the regulatory obligation put forth by Punjab Environmental Protection Act, 1997 (Amended 2012)

6.4 Environmental Policy

Proposed Jilani Coal Power Plant Management strives for environmental reverence that's why it has devised its environmental policy stating vision of the company towards environmental conservation. Our policy is:

- 1. to provide a quality product yet sustainable and environmental friendly working condition to its employees
- 2. conserve natural resources through adopting less waste policy
- 3. energy conservation through promoting environment friendly plant designs
- 4. to provide trainings to all employees to meet our environmental objectives

6.4.1 Management Approach:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

Institutional Responsibilities:

Following functionaries are involved in the implementation of EMP.

- 1. Project Proponent
- 2. HSE/ Project Manager
- 3. In-Charge Administration
- 4. Supervisor of Project
- 5. Environmental Engineer







6.5` Environmental Management and Monitoring Plan Structure and Responsibility

Table 6.2: Roles and Responsibilities

Positions	Significance	Stage	Environmental Responsibilities
Proponent / Owner	Critical	Operations	 Oversee Environmental Policy and EMMP Serve as primary contact to the regulatory authorities Commit resources to achieve environmental objectives
All Employees	Critical	Operation	 Attend training and understand their roles in the implementation of EMMP Understand the Environmental Policy / Objectives and act accordingly Participate in the review of EMMP Coordinate with the responsible authorities within the project to report any noncompliance to their Environmental Policy
Operational Supervisor	Critical .	Operational	 Understand the environmental policy of the project Operate in accordance with the environmental policy Ensure reducing solid waste generation Reduce water and energy wastage





		American de Profession de la construcción de la con	Ensure all machineries /equipment are in good conditions
			• Ensure health and safety of the workers
	,		during construction phase
			• Ensure safe transportation of
			good/materials to and from the project
	0.33		site
Maintenance	Critical	Operation	Understand the environmental policy of
Manager			the project
			Operate in accordance with the
			environmental policy
			Ensure reducing the chances of increased solid waste
	·		Reduce water and energy wastageEnsure all machineries /equipment are
			in good conditions
			• Ensure health and safety of the workers
	•		during operational phase
			• Provides health, safety and
			environmental awareness trainings to
			the staff
Administrative	Critical	Operational	Understand the environmental policy of
Person Deal			the project
with			Operate in accordance with the
Environment			environmental policy
Issues			• Ensure reducing the chances of
			increased solid waste
			Reduce water and energy wastage
			• Ensure all machineries /equipment are



A to the last of the second of	in good conditions
	Ensure health and safety of workers
	during operational phase
	• Receive health, safety and
	environmental awareness trainings
	• Prepare and maintain
	accidents/environmental risk records
	• Timely coordination with the
	responsible authority

6.6 Environmental Management Plan for proposed Jilani coal Power Plant

Jilani Coal Power plant believes in sustainable resource management which is why it has developed a comprehensive Environmental Management and Monitoring Plan for its operational phase.

Table 6.3: Environmental Management Plan

Environmental Element	Construction Phase	Operational phase
Air quality	 Continues water sprinkling will be done to avoid the dust at the construction site Vehicles should be in and out from the project site according to the schedule 	 Particulate matter control: Electrostatic precipitator (ESP) with 99.7% efficiency Sulfur dioxide (SO2) control: Flue Gas Desulfurization (FGD) with 80% efficiency
		➤ Nitrogen oxides (NOx): Low NOx firing





			technology in the boiler
			> Tree plantation will be done around the
			Jilani Coal Power Plant approximately
			2000 plants to make the environment
			friendly
			> Adopting a continuous monitoring
		·	program
	Solid waste	> During construction suite	Solid Waste Manger should be at site who
		there will be dust, iron pieces	will properly manage the solid waste
		or wrappers	> Domestic solid waste will also be
		> During construction phase the	managed properly which will also be
:		constructing material like	tackled by SW Manager who will further
:		concrete and mud etc. will be	deal with sanitary worker of that area
		reused to filling the ground	1
		while domestic waste will be	
		managed by solid waste	
		manager who will further deal	
		with sanitary worker of that	t
		area	
	Traffic	> During installation of coal	Disseminating information regarding the
		power plant, vehicles will	transportation schedule at Jilani Coal
		regulate according to the	
		necessarily and time schedule	> Limiting truck movements to off-peak
	1	> Traffic will not be entered	hours
		into the project site	> Installing adequate warning and signing
			at least 500 m down and up-gradient from
			the entrance of the Jilani Cola Power
			Plant
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in the second se	in the Memorial consequence of the consequence of t	>	Adopting on-site traffic control measures
		>	There will be defined schedule regarding
			vehicles for coal loading and unloading
Noise	> Adopting proper scheduling	4	Scheduling noisy activities during the
	of construction activities		daytime periods
	> Using personnel protection	~	Operating well-maintained mechanical
	gear such as earplugs, muffs,		equipment on-site
	etc.	>	Ensuring that equipment that may be
	·		intermittent in use should be shut down
			between work periods or should be
			throttled down to a minimum
		>	Using personnel protection gear such as
			earplugs, muffs, etc.
		>	Developing a greenbelt around the coal
			power plant
		>	Controlling air-flow generated noise by
			adopting adequate sizing of inlet/outlet
			ducts
Soil quality	Soil will not be spoiled by	>	Providing for adequate storage,
	installing of coal plant instead		appropriate disposal practices, or
	of this 2500 plants will be		complying with soil application
			Developing procedures for emergency
	soil quality good		clean-up of spilled fuel
			Avoiding the application of
			agrochemicals during on-site landscaping
			activities
Terrestrial	Said project site is located in		Preserving existing vegetation when
biodiversity	the industrial area where there		feasible, avoiding fires, prohibiting the
	is no biodiversity. Only few		disposal of wastes, hazardous and
	species of wild flora was		chemical material in non- allocated areas

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			present at the site.	<i>></i>	Adopting a vegetation program that uses
			At the site there was no any		indigenous stocks of local vegetation
			specie of endangered tree or	>	During operational phase client is
			plant.		committed to plant 2000 trees
		>	At the project site there was		
			no fauna which will be		
			disturbed during installation		
			of the coal power plant and		
			during operation of the plant.		
	Resource use	>	Resources utilization during	>	Implement a power consumption audit
			installation of coal power	>	Optimizing the process by providing
			plant will be done in		appropriate instruction/training of the
			sustainable way.		operators as well as through the
		>	The resources will be in		installation of new equipment
			record and properly managed	>	Using energy-efficient equipment that
			so that in less resource		should be properly operated, maintained,
			maximum output could be		and turned off whenever not in use
			achieved.	>	Adopting computer aided deposit
					evaluation and preparation techniques that
					can be used to plan for optimal resource
					utilization schemes
	Trash burning	>	Trash burning at the project	>	Trash burning at the project site will not
			site will not be allowed.		be allowed. Smoking and burning will be
			Smoking and burning will be		prohibited at the project site.
			prohibited at the project site.		
	Dust	>	During construction phase	>	During operational phase continues dust
,			continues sprinkling of water		cleaning will be done.
			will be done at the project site		
			so that dust would be		
			maintained at the surface level		
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		only.		
Environment	>	Proponent will plant the 2000	>	Proponent will plant 1000 trees at the
quality		plants during installation of		project site during operational phase.
enhancement		coal plant which will make	>	Jilani Coal Power Plant will never
measures		the air quality clean.		compromise on the standard and will start
	>	Security system will be		the work after getting environmental
		maintained at the project site		approval which will enhance the quality
		so that there should be not any		measures of the project.
		sort of incident.	>	Jilani Coal Power Plant will have budget
	>	Medical facilities will be		for the Environmental Management and it
		available 24/7 at the project		will be PKR 50,000.
		site.		
	>	All these measures will make		
		the project site very suitable.		
Staff for	×	Staff will be properly trained	>	Staff will be properly trained regarding
environmental		regarding follow the SOPs of		follow the SOPs of the system and adopt
management		the system and adopt all		all safety measures during working so that
plan		safety measures during		health risk and incident risk at the project
		working so that health risk		site should be minimum
		and incident risk at the project	>	Time by time training schedule will be
		site should be minimum		followed during operation of the plant so
				that risk factor would be negligible.
Health and	>	Restricting access to the	A	Restricting access to the facility by proper
safety		facility by proper fencing		fencing Maintaining a buffer area with a
		Maintaining a buffer area with		radius of 500 m
		a radius of 500 m	>	Installing warning signs in at the entrance
	~	Installing warning signs in		of the facility to warn people about the
		Urdu and English at the		risks associated with the coal power plant.
		entrance of the facility to		Displaying emergency telephone numbers
		warn people about the risks		for Police, Ambulance, and Fire services

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	associated with the coal	> Erecting a fence along the perimeter of
	power project site.	the site, consisting of non-combustible
	> Displaying emergency	wire screens, 3 m high, and with a mesh
	telephone numbers for Police,	of 50 mm or less to prevent unauthorized
	Ambulance, and Fire services	access
	> Locking gates outside	> Erecting site identification board of
	working hours	durable material and finish at the entrance
	> Provide complete PEP's to the	of the site giving the name of the site, and
	workers and encouraged them	the name, address and telephone number
	to use PEP's during working	of the site operator
	hours	> Providing at least one 24 hour guard for
	> Provide first aid box at the	the facility Keeping a daily record of
	site	persons and vehicles entering/leaving the
		site
		> Provide complete PEP's to the workers
		and encouraged them to use PEP's during
		working hours
		> Provide first aid box at the site
Ensuring site	> Visitors report to the site	> Visitors report to the site office where
safety	office where they should sign-	they should sign-in and be issued a pass.
	in and be issued a pass.	> Visitors should also sign out on departure
	> Visitors should also sign out	and surrender their pass.
	on departure and surrender	> No visitors should be permitted to access
	their pass.	the operational areas unless they have
	Personnel and visitors to the	received the express permission and have
	operational areas of the site	attended a site safety briefing or are
	wear personal protective	accompanied by an employee familiar
	clothing inclusive of high	and knowledgeable in site safety
	visibility clothing, protective	procedures
	footwear, and safety helmets	> Staff and employees working on-site

A. Willy



		100		THE REAL PROPERTY.	attend a safety and operational course
					before commencing work
				A	Personnel and visitors to the operational
					areas of the site wear personal protective
					-
					clothing inclusive of high visibility
					clothing, protective footwear, and safety
					helmets
	Enhancing	>	Safety is prior factor at the	\triangleright	A drinking water supply is provided at the
	safety at site		project site.		site Tanks are clearly labeled with details
	facilities	>	Barriers will be maintained at		of contents, potential hazards (e.g.
			the project site during		explosive, flammable, toxic etc.), and
			installation of coal plant.		emergency services telephone numbers
		>	First aid box will be at project	>	Electrical grounding is ensured while
			site at certain points		handrails and guard railing should be
		>	Emergency code will be		regularly inspected and maintained
			mentioned at point so the	>	Compacted service roads are provided
			project site		and maintained from the site entrances to
		>	Emergency numbers will be		the project site
			enlisted at the various points		
			of the plant		
	Regulating	>	Transportation will enter and	>	Vehicles should be licensed and have
	transportation		leave the project site		appropriate third party insurance
	on-site		according to the requirement	>	Transportation will enter and leave the
			and schedule		project site according to the requirement
		>	Only plant vehicles or staff		and schedule
			vehicles will be entered in the	>	Only plant vehicles or staff vehicles will
			project site.		be entered in the project site.
	Developing	~	Emergency code will be	>	A safety specialist should be responsible
	emergency/cont		mentioned at point so the		for the preparation, implementation and
			project site. Emergency		maintenance of a safety program, which
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 ingency plans	numbers will be enlisted at	NE PERSON A PE	should be periodically evaluated. The
	the various points of the plant		responsibility of the safety specialist
			includes performing safety training and
			conducting safety inspections, sessions
			and practice. He should also be
			responsible for the investigation of
			accidents. A safety committee should be
			formed and regular safety meetings
			should be organized.
		>	Contingency plans should be established
			to maintain occupational health and safety
			procedures for various aspects of
			operations, identify likely accidents,
			outline emergency scenarios, establish
			command hierarchy, organize
			communication lines, determine response
			actions, delegate responsibilities,
			designate evacuation signal, identify
			critical points mark on appropriate maps
			for each work area, and coordinate with
			local fire service, police and ambulance
			services.
		Δ	All safety equipment and tools should be
			regularly maintained. In addition,
			environmental friendly firefighting
			equipment such as dry powder
			extinguishers should be provided within
			the premises of the facility.
		A	Annual firefighting training drills for the
			operating staff should be conducted. The

N. Miller





	safety specialist should prepare,
	implement and maintain a comprehensive
	fire protection and prevention program.
	The safety specialist should also be
	responsible for the inspection and
	maintenance of the fixed and portable fire
	protection equipment and for the
	investigation of fire incidents
Ensuring	➤ Individuals working on the ➤ Individuals working on the coal power
personnel	coal power plant should be provided with overalls,
protection	provided with overalls, PEP's PEP's type overalls for wet weather
protection	type overalls for wet weather working, respiratory masks, eye
	working, respiratory masks, protection plugs, ear protection plugs and
	defenders; and high visibility Equipment (PPE) should be kept hygienic and in good condition. Workers should
	great the great transfer and the
	Appropriate and the second sec
	Protection Equipment (PPE) PPE and be convinced with the
	should be kept hygienic and importance of using PPE for their own
	in good condition. Workers safety and welfare.
	should also be trained on the Personal ID cards should be provided for
	appropriate use of PPE and be all employees a trained first aider should
	convinced with the be present on-site at all times during
	importance of using PPE for operational hours. First aid kits should be
	their own safety and welfare. kept at several locations and be regularly
	> The periodic health inspected to replenish any deficiencies
	monitoring program for on- > The periodic health monitoring program
	site workers should be for on-site workers should be enhanced to
	one workers should be for on-site workers should be enhanced to

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enhanced to allow record keeping of all illnesses and accidents occurring on-site. Regular medical checkups should be provided for staff on a semiannual basis Socioeconomic Local community will be encouraged to work at the plant site It will be ensured that there will be no dispute among the staff which can cause any sort of issue at project site Respect will be priority parameter among workers enhanced to allow record keeping of all illnesses and accidents occurring on-site. Regular medical checkups should be provided for staff on a semiannual basis Adopting policies to recruit locally and to hire local contractors when possible Adopting a monitoring plan to assess potential adverse impacts on nearby receptors Instigating a formal system which responds in a timely fashion to complaints about nuisances (air pollution, noise, etc.) Making emergency response teams available to local municipalities Making company clinics available to the surrounding community Committing to the publishing of data and reports Coordinate with local firefighting	 - Carlo Mar will - Carlo Market			SAMPLE TO	
accidents occurring on-site. Regular medical checkups should be provided for staff on a semiannual basis Socioeconomic Local community will be encouraged to work at the plant site It will be ensured that there will be no dispute among the staff which can cause any sort of issue at project site Respect will be priority parameter among workers medical checkups should be provided for staff on a semiannual basis Adopting policies to recruit locally and to hire local contractors when possible Adopting a monitoring plan to assess potential adverse impacts on nearby receptors Instigating a formal system which responds in a timely fashion to complaints about nuisances (air pollution, noise, etc.) Making emergency response teams available to local municipalities Making company clinics available to the surrounding community Committing to the publishing of data and			enhanced to allow record		allow record keeping of all illnesses and
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Socioeconomic Socioeconomic Local community will be encouraged to work at the plant site Adopting policies to recruit locally and to hire local contractors when possible Adopting a monitoring plan to assess Adopting a monitoring plan to assess Adopting a monitoring plan to assess Potential adverse impacts on nearby receptors Instigating a formal system which responds in a timely fashion to complaints Adopting a monitoring plan to assess Potential adverse impacts on nearby receptors Instigating a formal system which responds in a timely fashion to complaints Adopting a monitoring plan to assess Potential adverse impacts on nearby receptors Potential adverse impacts on nearby receptors Potential adverse impacts on nearby Potential adverse			Regular medical checkups		staff on a semiannual basis
Socioeconomic Local community will be encouraged to work at the plant site It will be ensured that there will be no dispute among the staff which can cause any sort of issue at project site Respect will be priority parameter among workers Socioeconomic Adopting policies to recruit locally and to hire local contractors when possible Adopting a monitoring plan to assess potential adverse impacts on nearby receptors Instigating a formal system which responds in a timely fashion to complaints about nuisances (air pollution, noise, etc.) Making emergency response teams available to local municipalities Making company clinics available to the surrounding community Committing to the publishing of data and			should be provided for staff		
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staff which can cause any sort of issue at project site Respect will be priority parameter among workers Making emergency response teams available to local municipalities Making company clinics available to the surrounding community Committing to the publishing of data and		>	It will be ensured that there		potential adverse impacts on nearby
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surrounding community Committing to the publishing of data and					available to local municipalities
surrounding community Committing to the publishing of data and				>	Making company clinics available to the
			•		
reports Coordinate with local firefighting				>	Committing to the publishing of data and
The state of the s					reports Coordinate with local firefighting
squadron on environmental performance					squadron on environmental performance

6.7 Environmental Monitoring Plan

Environmental monitoring is being followed and will be strictly undertaken in accordance with the requirements of the environmental authority (EPA, Punjab) to ensure compliance to the Punjab Environmental Quality Standards (PEQS) as and when required. Proponent has decided to spend 1 million PKR annually for sake of Environmental Budget. Environmental monitoring is including parameters that are mentioned in the Environmental Approval accorded by the Environmental Protection Agency, Punjab for getting approval under section 12.

IEE Report for Proposed 6.5 MW Jilani Coal Power Plant, Sheikhupura







Environmental monitoring plan will be followed during whole construction as well as operational period of the Jilani Coal Power Plant.

6.8 Institutional Arrangement

Administration under the supervision of the maintenance manager provides report directly to the Chief Executive Officer. The administration consists of skilled personnel with expertise in health, environment and safety issues. Roles and responsibilities for the implementation of EMMP are further explained earlier under the head Roles and Responsibilities.

6.8.1 Reporting

The proponent aims to provide timely, relevant and appropriately presented information to the concerned government authorities, local community surrounding the proposed project site on the environmental, health and safety performance of the project. The commitment would be met by record keeping and presenting it to the concerned authorities as and when required.

6.8.2 Staff Training

Staff training is important parameter that needs to be fulfilled adequately in order to ensure the successful implementation of environmental objectives. Keeping this fact under consideration, Jilani Coal Power Plant ensures that at proposed coal power plant, the employees, contractors and workers receive appropriate environmental awareness training. Staff training will be conducted on regular basis and it will be obtained through a variety of methods including training sessions, formal/informal meetings and discussion and formal presentations. Environmental awareness training would take place at various stages of the persons concerned with the proposed project. This would occur at the induction of any new employee/contractor/workers and will be made a regular on-site feature. Records of training content and attendance will be maintained.







Proposed Jilani coal power plant requires the persons involved during installation of plant and operational phase to be aware of following responsibilities and equipment, maintenance detail:

- 1. Their roles and responsibilities (including environmental incident reporting)
- 2. The environmental impacts (potential and actual) of their activities during construction and operation
- 3. Natural hazards such as earth quake and floods etc.
- 4. The potential consequence of poor environmental performance
- 5. Site emergency plans and their execution procedures

De	escription	Responsibility	Who will be involved	Outcomes
Air	r Quality	Administration	All employees	 Better understanding of the health impacts associated with air pollution Develop a monitoring and reporting system for air pollution Third party involvement especially EPA approved labs will be decided under potentially harmful circumstances
SW	VM	Administration	Staff	 The staff will be trained to follow the principles of keep the environment neat and clean Improved understating regarding health impacts







erie, el en esperación en	The second secon	المناسب			associated with unplanned
					waste management
				•	A monitoring and reporting
					system that would enable the
					supervisor to keep control o
					all unnecessary scattering
	Wastewater	Administration	Employees but	•	Wastewater regarding
			specific		domestic waste is managed
		,	attention to the		properly by the septic tanks.
			staff		
	Noise	Administration	All employee	•	Monitoring and reporting
					system for noise related issue:
					if detected
				•	Appropriate measures would
					be identified and implemented
				•	Guidance to the employee or
					adopting good practices for
					noise and any other practice
					that otherwise could lead to
					environmental nuisance.
	Firefighting	Administration	All employee	•	Improved understanding of
					keeping a tab on all potential
					threats that could lead to fire
					hazards
				•	Understanding on how to use
					the firefighting equipment
				•	Understanding regarding
					emergency exits and use of
					fire point





Landscaping	Administration	Staff	•	Improved efforts fo
				maintaining the green belt
				and tree plantations
Accidental Spills	Administration	All staff	•	Improved understanding
				regarding how to react during
				minor and major spills
				according to the measures
				identified

6.9 Environmental Audits and Reviews

Proposed Jilani Coal Power Plant will ensure conducting environmental audits to assess compliance with the conditions set under the environmental legislation and those mentioned by the EPA, Punjab during grant of Environmental Approvals. The objective of the environmental audit and review is to monitor and report both compliance and non-compliance with the statutes, EMMP and the conditions set under Environmental Approval. This would be done for the operational phase of the proposed project under the supervision of the administration.

6.10 Public Consultation

Social survey was held with the surroundings from the project area. They were of the view that the project has opportunities for surrounding people as well as will bring new income opportunities for the surrounding community ultimately helping in the reduction of poverty in the area to a greater extent. A sample of the questionnaire used for public consultation is attached along as **Annexure**.

Emphasis was placed on community awareness and perception about the proposed project. This was an important component of the entire study as social assessments are complementary part of environmental assessment. By and large, the people of the project area are well aware of the project and can well anticipate the activities that would entail once the project enters its operational phase. All of the respondents who participated in the public consultation process welcomed the project considering it beneficial both







economically and socially. According to their point of views, the project boost to their income by providing small income generating opportunities. People foresee this project as a positive precursor that would give rise to employment opportunities and small vendor's activities. No opposition from the public was confronted for the project.

6.11 Compensation in Money Terms

The project lies within the industrial zone which is also an open area and there is no population in the radius of 8-10 kilo meter. There is no cutting of flora and no harm to fauna by this project. There is no any structure or residence which is going to be damaged by project so there is no need for money compensation. Project is environment friendly.

6.12 Replacement, Relocation and Rehabilitation

Proposed Jilani Coal Power Plant will be installed in the industrial zone where there is neither any population nor any structure. So there is no need for replacement, relocation and rehabilitation of project. The operation of proposed Jilani Coal Power Plant will environment friendly and sound.

Elements of Occupational Health and Safety Management System (OHMS)

For an effective OHMS, the management of the project lead towards implementation the following elements:

- > Formulation of OHS Policy
- > Identification of risks, hazards and countermeasures
- ➤ Adoption of OHS Targets based on OHS Policy
- > Incorporation of opinions of stakeholders in OHS Plan
- > Implementation and operation of OHS plan
- Establishing an organizational documentation
- > Routine inspection and improvements system audits
- Revision of OSHMS







CHAPTER 7 RECOMMENDATIONS AND CONCLUSION





CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

Jilani Coal Power Plant is about to install for production of 6.5 MW energy for Jilani Group. Said project is at 17 km Sheikhupura Road, Sowa Messon Kaller, Sheikhupura. The project falls under Schedule-I (List of projects requiring an IEE). The project requires an Initial Environmental Examination (IEE). In order to ensure compliance with the lawful provision of section 12 of PEPA 1997 (Amended 2012) read with IEE/EIA Regulations 2000, the Initial Environmental Examination Report has been prepared and is being filed to the Environmental Protection Agency, Lahore for issuance of environmental approval.

Accordingly, this IEE report describes social, environmental, physical and other relevant aspects of the project during installation of Jilani Coal Power Plant (Construction phase) and operational stage and at its regular occupancy. The report also specifies necessary measures to be adopted for mitigation of environmental impact on the environment. It also provides information as desired under the format used for the preparation of this IEE Report.

The installation of coal power plant is for fulfill the demand of energy at plant site. Proponent is committed to plant 2000 plant species plant species during operational phase meanwhile budget for environment activities will be 1 million PKR annually. Detailed project alternatives have been considered in project description chapter and proper Environment Management Plan also has been discussed in Chapter VI.

However, the environmental aspects and impacts associated with generation of coal power plant considered. All infrastructure e.g., road, sewerage, water supply, electric supply, gas etc. already exist in the project area. The project is an environmental friendly site. Septic tanks are provided in the site premises for the treatment of domestic wastewater. Total solid waste generated from the project plant comprise mainly of paper, plastics organic matter and food waste. The project has its own administration set up for environmental monitoring and maintenance of site during operational stage. In order to handle fire hazards, fire hydrants and sprinklers are provided at many locations within the







premises. The baseline study has been conducted reviewing the available literature. The overall impact of the project can be considered positive.

For the effective implementation and management of the mitigation measures, an outline Environmental Management and Monitoring Plan (EMMP) has been developed.

Jilani Coal Power Plant is also based on the principles of sustainable development.

7.1 Conclusion

In view of the above it has been concluded that proposed project namely Jilani Coal Power Plant will be environmental friendly and sound practice. It is therefore requested to issue the environmental approval under section 12 of PEPA 1997 (Amended 2012) for the project that is of Jilani Coal Power Plant at 17 km Sheikhupura Road, Sowa Messon Kaller, District Sheikhupura.

