

The Registrar
National Electric Power Regulatory Authority (NEPRA)
NEPRA Tower
G-5/1, Islamabad

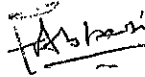
Subject: Application for Grant of Generation Licence

I, Faisal Abbasi Controller of Power Station Private Limited (PSPL) being the duly Authorised representative of Power Station Pvt Ltd PSPL by virtue of authority letter dated 20th June 2018 hereby apply to National Electric Power Regulatory Authority for the grant of a Generation Licence to PSPL for 53.406 MW gas fired Gas turbine based Project, pursuant to 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. I 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 BANK DRAFT in the sum of Rupees 393,000/- being the non-refundable licence application fee calculated in accordance with Schedule II to the National Electric Power Regulatory Authority Licensing (Application and Modification Procedure) Regulations, 1999, is also attached herewith.

Signature



Faisal Abbasi
Controller



Date: 20th June 2018

Power Station Pvt Ltd.

IMS Centre, 10 - K, Block - 6, P.E.C.H.S,
Shahrah-e-Faisal, Karachi-75400, Pakistan.
Ph: +92 (213) 4313196-7 Fax: +92 (213) 4311398
Website: <http://www.haqholdings.com>

Check List for Examination of New Generation Facility - License Application

Name of Company: Power Station (Pvt) Limited

Capacity: 60.240 MW(gross ISO)

Prepared/Updated on: December 2, 2018

Regulation	Information/Documents Required	Compliance		Remarks
		Yes	No	
3(1)	Authorization from Board Resolution / Power of Attorney	Yes		
3(3)	Application fee (including Indexation)	Yes		
3(4)	Three copies of Application	Yes		
3(5)(a)(i)	Certificate of incorporation	Yes		
3(5)(a)(ii)	Memorandum and articles of association	Yes		
3(5)(a)(iii)	Annual Return statements or in lieu thereof	Yes		
3(5)(b)	Profile of experience of the applicant its management, staff and its members in power sector.	Yes		
3(5)(c)	CVs of applicant's Senior Management and Technical professionals	Yes		
3(5)(d)(i)	Cash balance & bank certificates	Yes		
3(5)(d)(ii)	Expression of interest to provide credit or financing along with sources and details thereof	Yes		Bank letter attached
3(5)(d)(iii)	Latest financial statements	Yes		
3(5)(d)(iv)	Employment records of Engineers & Technical Staff	Yes		
3(5)(d)(v)	Profile of Sub-contractors	NA		
3(5)(d)(vi)	Verified references w.r.t. experience of the Applicant and its sub-Contractors	Yes		Profile of HMS attached
3(5)(e)	Encumbrances on assets	NA		expression of interest from bank for loan attached
3(5)(f)	Technical and financial proposal for Operation, maintenance, planning and development of the generation facility.	NA		PSPL shall perform O&M itself
3(5)(g)(a)	Type of Technology	Yes		GT+ST (Combined Cycle
3(5)(h)	Feasibility Report	Yes		
3(5)(i)	Prospectus	Yes		

Schedule II				
1.	Location (location maps, site maps) land	National Industrial Park, Karachi		Provided
2.	Plant: Gas turbine based combined cycle -	Provided		GT+ST
4.	Technology: Combined Cycle Gas turbines	Yes		Kawasaki Gas turbine/Man Steam turbine
6.	ESSA (Environmental and Social Soundness Assessment)	Yes		Provided
7.	Detailed feasibility report	Yes		Provided
8.	Resettlement issues	None		Settled
9.	Consents	Yes		IEE approved . Detailed feasibility study conducted and approved by the board of NIP. Concession Agreement copy enclosed
10.	Infrastructure development	Yes		NIP has assumed responsibility of infrastructure development
11.	Interconnection with National Grid Co, distance and name of nearest grid, voltage level (single line diagram)	NA		Plant to supply electricity to NIP under Concession Agreement. NIP , under NIP act is authorized
12.	Project cost, information regarding sources and amounts of equity and debt.	Provided		Project Cost-USD 70.589 million Debt- 80% Equity -20%
13.	Project schedule, expected life	Phase wise development-Phase 1 development time 18 months		Phase -1: 7.53 MW (gross ISO) Phase -2 : 12.55 MW (gross ISO) Phase -3 : 40.16 MW gross ISO Concession period 35 years
14.	Peaking/base load operation			No peaking

15.	Plant characteristics: generation voltage, power factor, frequency, automatic generation control, ramping rate, control metering and instrumentation			Generating Voltage -11 KV Frequency --50 Hz Power Factor - Leading 0.95 & Lagging 0.8 Automatic Generation Control --No Ramping Rate -10 minutes Alternative Fuel - No Auxiliary Consumption - 0.306 MW (3% of installed capacity) Time required to Synchronise -5 minutes
16.	System studies load flow, short circuit, stability	NA		Captive power plant
17.	Training and development	Attached		

December 03, 2018

Reference No: 019/PSPL/2018

Mr. Iftikhar Ali Khan

Director

Registrar Office

National Electric Power Regulatory (NEPRA)

NEPRA Tower

G-5/1, Islamabad

Subject : Application of Power Station (Pvt) Limited for Grant of Generation License in Respect of 60.240 MW (gross ISO) Combined Cycle Power Plant

Dear Sir,

Reference your office letter No. NEPRA/R/LAG-30/17350 dated November 07, 2018. Vide letter referred herein, your office has mentioned certain discrepancies in the Application of Power Station (pvt) Limited for grant of Generation License for its 60.240 MW gross ISO combined cycle power plant. We would like to respond to your questions/queries as follows.

1. National Industrial Park is not a direct consumer itself and PSPL's apparent framework does not fall under the Generation License+ second tier supply authorization framework (sale of power by generation licensee to BPCs) or any other framework provided under the law

Response:

In response to the above comment we would like to reiterate our submission made in the Application for grant of Generation License and we provided the basis of Application, the same is reproduced below

- To stimulate rapid industrial growth by establishing world class industrial parks throughout Pakistan, National Industrial Parks (NIP) Management and Development Company has been established by the Ministry of Industries and Production, Government of Pakistan.
- The company is a subsidiary of the Pakistan Industrial Development Corporation (PIDC) and has been set up as a Public-Private partnership.

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The Board of Directors (BoD) comprises of 12 members inclusive of professionals/ individuals having exceptional record of services relating to industrial development and represent non-governmental organizations, academia and the business community. 75% of the Board members are from the private sector whilst the remaining 25% are from the public sector.

Development of Power Generating Facility

Under the Special Economic Zones Act 2012, section 27 (2) (copy enclosed), each industrial Park developer has the right to develop its own captive power plant. Korangi creek Industrial Park (KCIP-NIP) while exercising the same right has entered into a Concession Agreement (copy enclosed) with Power Station (Pvt) Limited to develop Captive Power Plant for the Supply of Electricity to the industrial units through NIP (Primary Power Purchaser) and to sell any additional Power to another buyer (Secondary Buyer), subject to the applicable regulations.

While fuel availability is ensured by NIP under the Gas Supply Agreement (GSA signed between NIP and SSGCL), and the NOC /Side Agreement SSGCL agreed to allow NIP to make available the gas to any joint venture or BOO arrangement for power generation (in the instant case, PSPL) PSPL has been granted the rights for the development, operation and maintenance of the power plant. For the avoidance of doubt, NIP has committed under the Concession Agreement to make available the gas, so that payment of gas bills will be made directly by NIP to SSGCL.

PSPL being the Concessionaire has applied for grant of Generation License for the facility.

It is pertinent to mention that PSPL's responsibility is limited to generation of power and the limit of responsibility is up to the bus bar of the plant. From there onwards NIP is responsible for transmission & distribution and /or Sale of power to end consumers through the network developed in the Industrial Park

We understand that NIP is required to apply and secure necessary approvals/licenses for T&D as well as sale to end consumer which is not the business and responsibility of PSPL neither under Power Purchase Agreement (PPA) nor under Concession Agreement. Hence PSPL's Application should be considered accordingly.

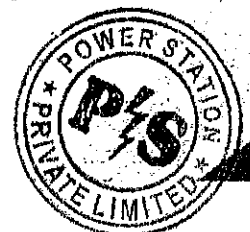
2. The attached GSA and NOC are not applicable to Generation License Applicant (i.e. PSPL)

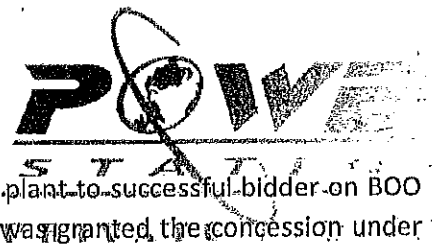
Response:

Gas Supply Agreement (GSA) dated December 09, 2009 was signed between NIP and SSGCL for supply of gas up to 9.7 MMSCFD for power generation. Under the NOC/Side Agreement dated November 18, 2009 NIP and SSGCL agreed that NIP can make use of the gas for power generation on its own or through a joint venture or Build Own Operate arrangement (BOO). NIP

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management decided to grant concession to develop power plant to successful bidder on BOO basis and after the bidding process. (RFP , April 2014) PSPL was granted the concession under the Concession Agreement dated January 10, 2014. The Concession agreement is based on the premise that NIP would make available the gas to Concessionaire (PSPL). The commitment made by NIP in turn is based on the GSA signed between NIP and SSGCL and the Side Agreement mentioned above. It is pertinent to mention here that PSPL does not make payment directly SSGCL, rather amount of gas bill is adjusted from price of electricity.

3. As per their latest tax returns (Form -A, 31.10.2016), only 30 shares are allotted amongst 3 persons. The remaining 99,970 shares are unaccounted for.

Response

The remaining shares (i.e 999,970 shares) = 99.99% of the company) are unaccounted for because these are qualification shares from which the company is incorporated and the remaining amount of shares (999,970 shares is accounted for under advance against shares. The company has decided to increase the authorized capital and whole amount of increased shares including advance against shares shall be reported to SECP after fulfilling filing requirements once for all.

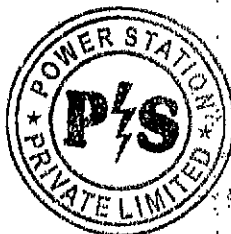
We understand that the learned members of the Authority would consider our response provided above.

The original Application along with supporting document and bank draft for the prescribed fee is resubmitted please.

Best regards

Faisal

Faisal Abbasi



Controller Haqholdings

Power Station Pvt Ltd.

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Shahrah-e-Faisal, Karachi-75400, Pakistan.

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July 23, 2018

Mr. Iftikhar Ali Khan
Director
Registrar Office
National Electric Power Regulatory (NEPRA)
NEPRA Tower
G-5/1, Islamabad

Subject: Application of Power Station (Pvt) Limited for Grant of Generation License in Respect of 53.406 MW Combined Cycle Power Plant-Clarifications on the Contractual Obligations of Various Stakeholders

Dear Sir,

Reference your office letter No.NEPRA/R/LAG-30/9900 dated June 28, 2018 and our office letter in response to the same. In order to assist your good office for swift, we would like to provide details on the roles and responsibilities of various stakeholders in the project. Following are the pertinent details.

1. Purpose

The project is being developed under the Concession Agreement between Power Station (Pvt) Limited, "PSPL" and National Industrial Park (Pvt)Limited, "NIP" Ministry of Industries & Production, Government of Pakistan for its Korangi Creek Industrial Park. NIP would purchase electricity from the project as "Power Purchaser" and would distribute and supply electricity to the industrial units being setup in the Industrial Park. For Supply and Distribution activity, NIP shall apply for requisite license(s) i.e. Distribution License and Supply License in due course of time.

2. Contractual Arrangement between NIP and PSPL-

Concession Agreement has been signed between the two parties, with PSPL as "Concessionaire" and NIP as Primary Power Purchaser. Any excess electricity would be sold to Secondary Power Purchaser with the mutual consent of both parties. PSPL does not get into the distribution or supply or both and Sells electricity to NIP or Secondary Power Purchaser (if applicable) subject to NEPRA approval

In brief, PSPL – Concessionaire under the Concession Agreement, responsible to generate and sell electricity to NIP (Primary Power Purchaser)/Secondary Power Purchaser subject to NEPRA approval.

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Power Purchaser

Primary Power Purchaser/Power Purchaser- NIP

Secondary Power Purchaser – if needed ,subject to NEPRA approval

Supply & Distribution Arrangements

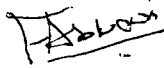
Distribution – Responsibility of NIP (Applications to be submitted separately)

Supply - Responsibility of NIP (Applications to be submitted separately)

NIP has been developing supply and distribution network in the industrial park and the details would be presented in their respective applications to be submitted before the Authority.

In case of any further queries, please do not hesitate to contact the undersigned.

Best Regards



Controller Haqholdings
Faisal Abbasi



Power Station Pvt Ltd.

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Shahrah-e-Faisal, Karachi-75400, Pakistan.

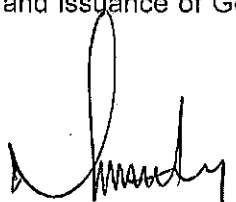
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**RESOLUTION
OF THE
BOARD OF DIRECTORS
OF
POWER STATION PRIVATE LIMITED**

**RESOLUTION FOR FILING OF GENERATION LICENSE APPLICATION FOR 53.406 MW
GAS TURBINE BASED POWER PROJECT at National Industrial Park (NIP) Karachi
passed on 20th May, 2018.**

It is hereby RESOLVED THAT the Chief Executive of Power Station Pvt Ltd (PSPL) is authorized to file an application for the issuance of Generation License for 53.406 MW gas turbine based project

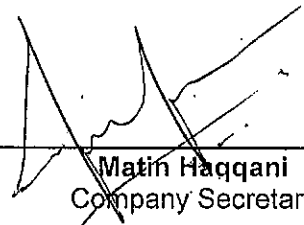
FURTHER RESOLVED THAT the Chief Executive of Power Station Pvt Ltd, or a person(s) nominated by the Chief Executive, is hereby authorized to sign all documentation pay all NEPRA fees, appear before NEPRA and provide any information required by NEPRA with respect to the Project, and inter alia conduct all necessary business required for the processing and issuance of Generation License for the aforementioned Power Project from NEPRA.



Mahmoud ul Haq
Chief Executive



Asad ul Haq
Director



Matin Haqqani
Company Secretary



Power Station Pvt Ltd.

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Basis of Application

- To stimulate rapid industrial growth by establishing world class industrial parks throughout Pakistan, National Industrial Parks (NIP) Management and Development Company has been established by the Ministry of Industries and Production, Government of Pakistan.
- The company is a subsidiary of the Pakistan Industrial Development Corporation (PIDC) and has been set up as a Public-Private partnership.

The Board of Directors (BoD) comprises of 12 members inclusive of professionals / individuals having exceptional record of services relating to industrial development and represent non-governmental organizations, academia and the business community. 75% of the Board members are from the private sector whilst the remaining 25% are from the public sector.

Development of Power Generating Facility

Under the Special Economic Zones Act 2012, section 27 (2) (copy enclosed), each industrial Park developer has the right to develop its own captive power plant . Korangi creek industrial Park (KCIP-NIP) while exercising the same right has entered into a Concession Agreement (copy enclosed) with Power Station (Pvt) Limited to develop Captive Power Plant for the Supply of Electricity to the industrial units through NIP (Primary Power Purchaser) and to sell any additional Power to another buyer (Secondary Buyer), subject to the applicable regulations.

While fuel availability is ensured by NIP under the Gas Supply Agreement (GSA signed between NIP and SSGCL), development , operation and maintenance has been agreed to carried out by Power Station Private Limited (PSPL) .

PSPL being the Concessionaire hereby applies for grant of Generation License for the facility

Draft Generation License

Article - 1

Definitions

(1) In this Licence:

- a. "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997);
- b. "Authority" means the National Electric Power Regulatory Authority constituted under Section 3 of the Act.
- c. "Licensee" means Power Station Private Limited Combined Cycle Power Project at National Industrial Park, (NIP) Karachi
- d. "Rules" mean the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000.

(2) Words and expressions used but not defined herein bear the meaning given thereto in the Act or in the Rules.

Article - 2

Application of Rules

This Licence is issued subject to the provisions of the Rules, as amended from time to time.

Article - 3

Generation Facilities

- (1) The location, size, technology, interconnection arrangements technical limits, technical functional specifications and other details specific to the generation facilities of the licensee are set out in Schedule - I to this Licence.
- (2) The net capacity of the generation facilities is set out in Schedule - II hereto.
- (3) The Licensee shall provide the final arrangement, technical and financial specifications and other details specific to generation facilities before commissioning of the generation facilities.

Article - 4

Term

- (1) The Licence is granted for a term of **thirty (30) years** after the commercial operation date.
- (2) Unless revoked earlier, the licensee may, **ninety (90) days** prior to the expiry of the term of the licence, apply for renewal of the Licence under the Licensing (Application and Modification Procedure) Regulation, 1999.

Article - 5

Licence Fee

The Licensee shall pay to the Authority the Licence fee in the amount and manner and at the time specified in the National Electric Power Regulatory Authority (Fee) Rules, 2002.

Article - 6

Tariff

The Licensee shall charge from its consumers only such tariff which has been approved by the Authority.

Article - 7

Competitive Trading Arrangement

- (1) The Licensee shall participate in such measures as may be directed by the Authority from time to time for development of the Competitive Trading Arrangement. The Licensee shall in good faith work towards implementation and operation of the aforesaid Competitive Trading Arrangement in the manner and time period specified by the Authority:

Provided that, any such participation shall be subject to any contract entered into between the Licensee and another party with the approval of the Authority.

- (2) Any variation and modification in the above mentioned contracts for allowing the parties thereto to participate wholly or partially in the Competitive Trading Arrangement shall be subject to mutual agreement of

the parties thereto and such terms and conditions as may be approved by the Authority.

Article – 8

Maintenance of Records

For the purpose of sub-rule (1) of Rule 19 of the Rules, copies of records and data shall be retained in standard and electronic form and all such records and data shall, subject to just claims of confidentiality, be accessible by the authorized officials of the Authority.

Article – 9

Compliance with Performance Standards

The Licensee shall conform to the relevant NEPRA rules on Performance Standards as may be prescribed by the Authority from time to time.

Article – 10

Compliance with Environmental Standards

The Licensee shall conform to the environmental standards as may be prescribed by the relevant competent authority from time to time.

Article – 11

Provision of information

- (1) The obligation of the licensee to provide information to the Authority shall be in accordance with Section 44 of the Act.
- (2) The licensee shall be subject to such penalties as may be specified in the relevant rules made by the Authority for failure to furnish such information as may be required from time to time by the Authority and which is or ought to be or have been in the control or possession of the licensee.

Schedule - 1

It contains the following information / drawings / sketches relating to the Power Plant Equipment and related System which are attached here with:

Plant Details

General Information

Plant Configuration

Fuel Details

Emission Values

Installed Capacity

Derated Capacity

Expected Life

Operation Record

Cooling System

Plant Characteristics

Other details specific to the generation facility of the licensee such as:

- Technical Limits of the Plant
- Site Plan of Ranolia Power Plant
- General Layout of entire Ranolia Power Plant
- Interconnection Arrangements with National Grid

Plant Details

General Information

Name of Applicant: Power Station Private Limited-Combined Cycle Power Project at NIP Karachi

Address of the registered office : IMS Center, 10-K, Block 6 , PECHS ,Karachi

Plant Location : National Industrial Park, Korangi Karachi

Type of Facility : Gas Fired Combined Cycle Gas turbine based

Plant Configuration

3 blocks each comprising of 2 GTS +I steam turbine (Total 6 GTs + 3 STs)

*Power Station Private Limited-
Generation License
Combined Cycle Power Project at NIP Karachi*

Capacity of the Power Plant ; Gross ISO 60.240 MW , 53.406 MW Gross at mean site conditions /48.400 MW Net saleable for 95% p.f. to be developed in phases as follows :

Phase (1)- 1 GT- 7.530 gross ISO /6.40 MW at mean site conditions

Phase (2)- 1GTs+ IST- 12.55 MW gross ISO , 11.42 MW at mean site condition additional to phase -1

Phase (3)-4 GTs + 2STs (40.16 MW Gross ISO, 35.64 MW at mean site conditions -- additional to Phase 1&2.

Type of Technology Gas turbine based combined cycle

Number of Units / Capacity 6 GTS each of 7.530 MW ISO/6.40 MW (gross) at
Site conditions, net 6.07 MW

3Steam turbines each of 5.02 MW

Power Plant Make and Model

Gas Turbine Kawasaki GPB80

Steam Turbine MAN Turbo Diesel

Commissioning Date (s)

Phase 1-	Under testing
Phase -2	December 2022
Phase -3	December 2024

Fuel Details

Type of Fuel :	Pipeline Quality Gas
Fuel (Imported / Indigenous)	Indigenous
Fuel Supplier	SSGC

Emission values

SOx	As per NEQs
NOx	As per NEQs
CO ₂	As per NEQs
PM10	As per NEQs

*Power Station Private Limited-
Generation License
Combined Cycle Power Project at NIP Karachi*

Installed Capacity	60.240 MW ISO (Gross)/53.406 at
MSC (Gross)	
Auxiliary load	2.40 MW
Expected Life of the Facility	30 years
Operation Record	New Plant to be commissioned by
2024 completely	

Plant Characteristics

Generating Voltage	11 KV
Frequency	50 Hz
Power Factor	Leading 0.95 & Lagging 0.8
Automatic Generation Control	Provided
Alternative Fuel	Only allowed if required by NIP to
operate on HSD	
Auxiliary Consumption	2.4 MW (4.7% of installed capacity)
Time required to Synchronise -----	5 minutes

SCHEDULE – II

The Net Capacity of the Licensee's Generation Facility

Gross Installed Capacity of the Plant (ISO)	60.240 MW
Derated Capacity of the Plant	53.406 MW
Auxiliary Consumption of the Plant	2.40 MW
Net Capacity of the Plant	51 MW
Considered for 95% availability	48.40 MW
Construction Period	To be completed in phases (last phase
-December 2024)	
Expected date of Commercial Operation of the Plant –	December 2024

Note: These are indicative figures provided by the Licensee.

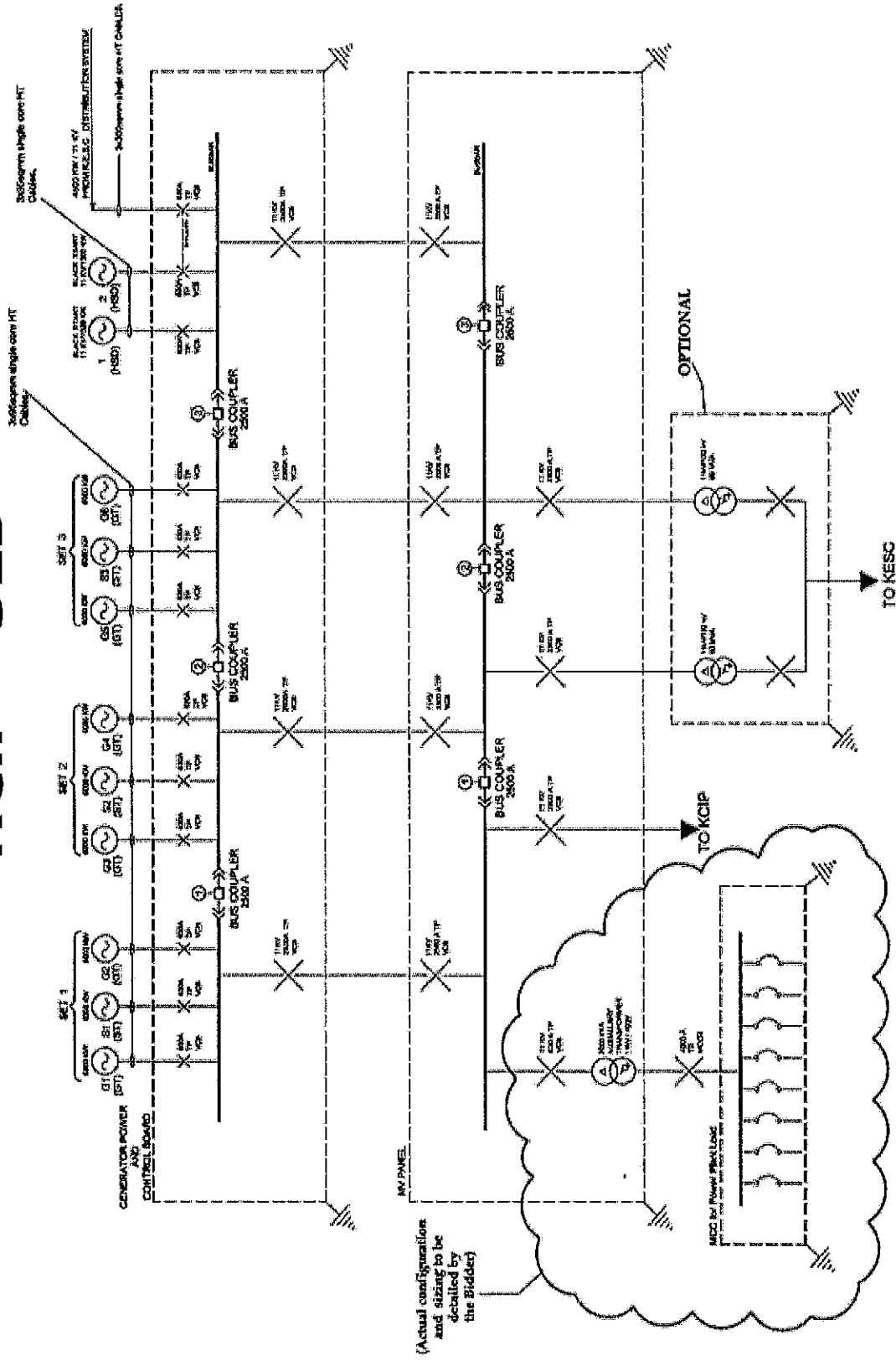
The Net Capacity of the Plant available for dispatch to Power Purchaser will be determined through procedures contained in the EPC Agreements or Grid Code

Interconnection Arrangement with National Grid for Power Dispersal of the Plant

The plant will sell electricity to the NIP system at KCIP (Karachi) which in turn will supply electricity to industrial units at the KCIP Industrial Park, Karachi.

Single Line Diagram

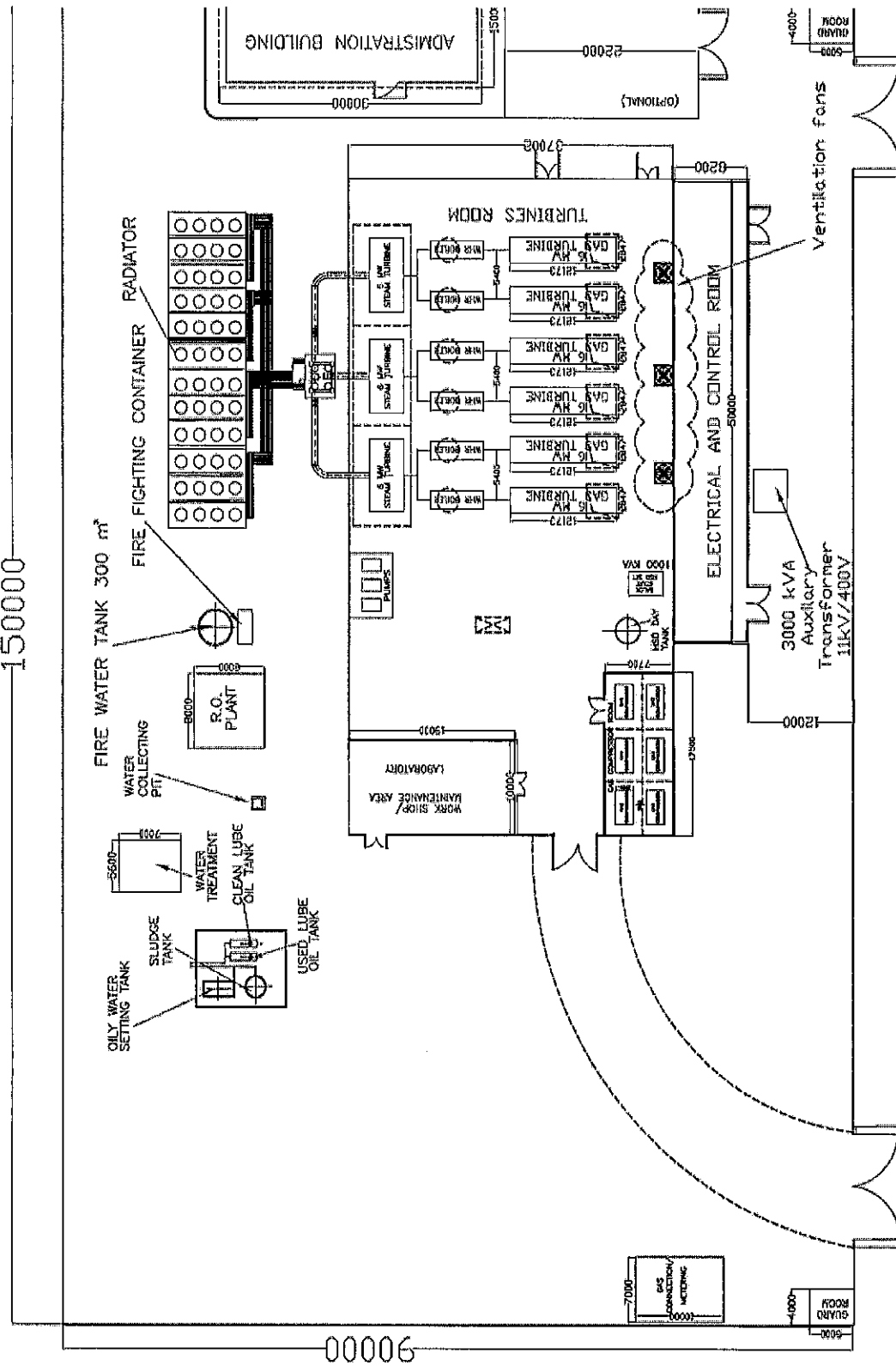
KCIP – SLD



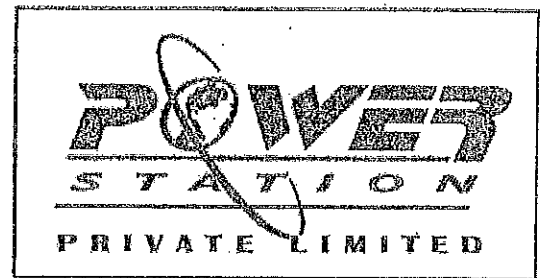
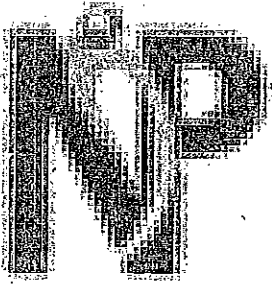
(Actual configuration and sizing to be detailed by the Bidder)

Plant Layout

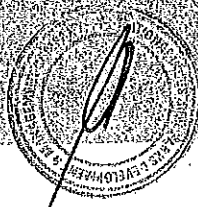
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Copy of Concession Agreement



**CONCESSION AGREEMENT
BETWEEN
NATIONAL INDUSTRIAL PARKS
&
POWER STATION PRIVATE LIMITED**



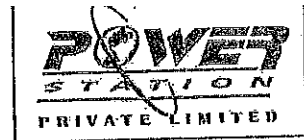
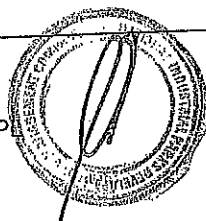


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CONCESSION AGREEMENT

THIS CONCESSION AGREEMENT (this "Agreement") is made at Karachi as of the 13 day of January 2014, by and between:

- (1) **NATIONAL INDUSTRIAL PARKS DEVELOPMENT AND MANAGEMENT COMPANY**, a company incorporated under section 42 of the Companies Ordinance, 1984 having a share capital and limited by guarantee having its head office at 2nd Floor, Block C, Finance and Trade Centre, Shahrah-e-Faisal, Karachi (hereinafter referred to as "**NIP**" which expression shall include its successors-in-interest and permitted assigns); of the FIRST PART; and
- (2) **Power Station Private Limited** a private limited company incorporated under the laws of Pakistan, whose principal office is located at 10 K Block 6 PECHS Karachi, Pakistan (hereinafter referred to as the "**Concessionaire**" which expression shall include its successors-in-interest and permitted assigns); of the OTHER PART.

(Each of NIP and the Concessionaire is hereinafter referred to individually as a "**Party**" and, collectively, as the "**Parties.**")

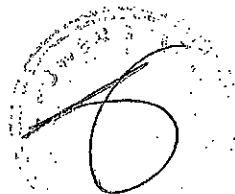
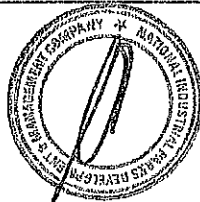
RECITALS

- A. **WHEREAS**, NIP has been established as a special Initiative of the Ministry of Industries, Production and Special Initiatives, Government of Pakistan (the "**GOP**") to, *inter alia*, support industrialization in the country by establishing new industrial parks and rehabilitate those that may be handed over by the Government/Provincial Government(s) and to undertake related functions;
 - B. **WHEREAS**, NIP, on April 13, 2010 issued a "**Request for Proposals**" ("**RFP**") to various companies requesting such companies to submit proposals for the installation and commissioning of a power plant of up to 48 MW as a captive power plant at the Korangi Creek Industrial Park, Karachi for primarily supplying energy to the industrial users situated within the estate being developed by NIP in Korangi as the primary power purchaser (the "**Primary Power Purchasers**"), and thereafter supplying any energy remaining surplus after the requirements of the Primary Power Purchasers have been met to Bulk Power Consumers (as hereinafter defined) as approved by NIP as the secondary power purchaser ("**Secondary Power Purchaser**") under specific power purchase agreements, which proposals would be evaluated and selected on the basis of acceptable proposals offering the lowest tariffs;
- (The Primary Power Purchasers and the Secondary Power Purchaser are hereafter sometimes collectively referred to as the "**Power Purchasers**");
- C. **WHEREAS**, the Concessionaire has submitted to NIP a proposal for the design, engineering, construction, insuring, commissioning, operation and maintenance, as required and instructed by NIP, of a gas – fired electric generation facility of up to 48 MW (the "**Plant**", as

hereinafter defined) to be located at Korangi Creek Industrial Park, Karachi, Pakistan and for the subsequent supply of energy to the Primary Power Purchasers at the tariff indicated in the Bid as amended and revised following discussions between NIP and the Concessionaire;

- D. **WHEREAS**, NIP has evaluated the proposal / Bid submitted in response to the Request for Proposals, including the Concessionaire's proposal / Bid, and has determined that the Concessionaire's proposal / Bid is technically acceptable and that its tariff proposal is among the lowest acceptable tariffs, and, as a result, on October 15, 2010, upon the delivery by the Concessionaire of the Bid Security (as hereinafter defined), NIP issued to the Concessionaire a Letter of Intent (as hereinafter defined) for the design, engineering, construction, insuring, Commissioning, operation and maintenance of the Plant for such period as specified in this Agreement (the "**Project**", as hereinafter defined);
- E. **WHEREAS**, simultaneously herewith, the Concessionaire may enter into separate power purchase agreement(s) with the Secondary Power Purchaser(s);

NOW, THEREFORE, in consideration of the mutual benefits to be derived and the representations and warranties, conditions and undertakings herein contained, and intending to be legally bound hereby, the Parties hereby agree as follows:



ARTICLE 1: DEFINITIONS AND INTERPRETATIONS**1.1 Definitions**

The words and expressions beginning with capital letters and defined in this Concession Agreement shall, unless the context otherwise requires, have the meaning ascribed thereto herein, and the words and expressions defined in the Schedules and used therein shall have the meaning ascribed thereto in the Schedules. Any word and expression with capital letters not specifically defined herein shall have the meaning ascribed to it under the RFP.

Affected Party shall have the meaning as described in clause 17.1 to this Concession Agreement;

Applicable Approvals shall mean all approvals, affiliations, clearances, consents, permissions, licenses, authorizations, no objection certificates, exemptions, recognitions required to be obtained from the Statutory Authorities prior to setting up and commencement of operations of the Plant under the Applicable Laws;

Applicable Laws shall mean all laws, brought into force and effect by the GOP and/or the NIP including rules, regulations, circulars, guidelines, policy initiatives and notifications made there under and judgments, decrees, injections, writs and orders of any court, applicable to this Project and the exercise, performance and discharge of the respective rights and obligations of the respective Parties hereunder as may be enforced and are in effect during the subsisting of this Project;

Assets shall mean movable and immovable property which may be built, obtained, purchased and/or acquired by the Concessionaire for the Plant under the Project;

Average Estimated Annual Billing means the average of the total / aggregate amount billed by the Concessionaire to the Primary Power Purchasers and the Secondary Power Purchaser(s), such bill to be sent to the Power Purchasers by the Concessionaire only through NIP;

Bid shall mean the response to the RFP dated April 13, 2010, submitted by the Bidder on or before the Due Date of Submission;

Bidder(s) shall mean Person who has submitted his Bid in response to the RFP;

Bid Security shall mean an irrevocable and an unconditional bank guarantee of an amount equivalent to USD 10,000.00/- (United States Dollars Ten Thousand only) of the to be provided by the Successful Bidder along with the Bid in terms of the RFP in the form provided in **Schedule B**;



Bulk Power Consumer shall bear such meaning as ascribed to the term in the Regulation of Generation, Transmission and Distribution of Electric Power Act 1997;

Change in Law shall mean occurrence of any of the following events after the execution of this Concession Agreement:

- (a) Enactment of any new Applicable Law;
- (b) The repeal in whole or in part (unless re-enactment with the same effect);
- (c) Modification of any existing Applicable Law;
- (d) Commencement of any Applicable Law which was not into force at the time of the execution of this Concession Agreement;
- (e) Change in interpretation or application of any Applicable Law;
- (f) Imposition or requirement of a new statutory or regulatory approval;
- (g) Modification in the terms and conditions on which a statutory or regulatory approval has already taken place; or
- (h) A fresh imposition of a tax or duty that was not in existence on the Effective Date. It is clarified that a change in the rate of tax or duty that was in existence on the Effective Date shall not be considered a change in law for the purposes of this Article;

Completion and Operations Date or COD shall mean the date on which the NIP issues to the Concessionaire an Operation Commencement Certificate, and such Operation Commencement Certificate shall be issued by the NIP upon the Concessionaire obtaining and submitting with the NIP a Construction Completion Certificate provided that the Concessionaire will have the option to set up the Project in a modular form if, in the reasonable assessment of the Concessionaire and as verified by NIP, the complete energy requirements of the Primary Power Purchasers will be satisfied by a modular approach and in such an event, the completion of each Module will be considered as the Completion and Operations Date for such Module;

Concession shall mean the exclusive right, authority and authorization to use the Project Site to build, construct, operate, manage and maintain the Plant during the Concession Period;

Concession Agreement shall mean this agreement between the NIP and the Concessionaire for implementation of the Project on the terms and conditions agreed hereunder;

Concessionaire Event of Default shall have the meaning ascribed to it in clause 18.2 (a) of this Concession Agreement;

Compliance Period shall have the meaning ascribed to it in clause 4.1.5 (a) of this Concession Agreement;

Concession Period shall mean the aggregate of the Phase 1 Period and the Phase 2 Period, unless extended further as per the provisions of this Concession Agreement;

Condition Precedent shall mean the conditions to be met and fulfilled by the Concessionaire and/or NIP, as the case may be and are more specifically described in clause 4.1 to this Concession Agreement;

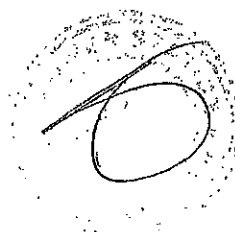
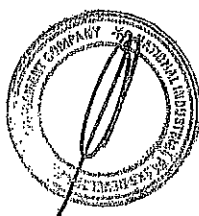
Construction Completion shall mean one hundred percent (100%) completion of the construction in accordance with the Drawings submitted by the Concessionaire with NIP and the Independent Expert and such completion being certified by the Independent Expert by issuing the Construction Completion Certificate provided that where the Project is being set up in a modular form, a separate Construction Completion Certificate will be issued by the Independent Engineer in respect of each Module and the relevant Module will be deemed as completed upon the Construction Completion Certificate in respect of such Module being issued by the Independent Expert;

Construction Completion Certificate shall mean a certificate issued by an Independent Expert upon examining and being satisfied with the quality of construction and performance of the Plant or any Module thereof in accordance with the Drawings submitted with the NIP by the Concessionaire for establishment of the Plant;

Construction Phase shall mean the period during which the Concessionaire shall carry on the construction of the Plant and unless extended further in accordance with the provisions of this Concession Agreement, shall be a period of 18 months starting from the Effective Date provided that where construction of the Plant is being carried out in a modular phase, the construction period for each Module shall be as mutually determined and agreed by the Parties keeping into account the size of each Module;

Construction Phase Performance Security shall mean an irrevocable and an unconditional insurance guarantee of an amount equivalent to USD 31,250/- (United States Dollars Thirty one thousand, two hundred and fifty only) for ⁴⁸each MW to be commissioned by the Concessionaire in terms of this Agreement which Construction Phase Performance Security shall be provided by the Concessionaire in terms of this Concession agreement in form provided in **Schedule D**, within in such time as may be requested by NIP.

Contractor shall mean a contractor or contractors, if any, with whom the Concessionaire has entered into agreements for design and construction of the Plant;



Cure Period shall mean the period specified in this Concession Agreement for curing any breach or default of any provision of this Concession Agreement by the Party responsible for such breach or default and upon failing of which this Concession Agreement may be terminated by the other Party;

Drawing(s) shall mean the drawings, construction plan, building layout, material specifications and construction schedule that will be submitted with NIP by the Concessionaire within a period of three (3) months from the date of handing over the possession of the Project Site to the Concessionaire and modified / changed / approved in accordance to provisions of clause 4.1.2 (d) to this Concession Agreement;

Due Date of Submission shall mean the date for submission of Bids as per the provisions of the RFP;

Effective Date shall mean the date on which the Conditions Precedent in the Concession Agreement have been satisfied or waived according to the terms hereof and unless extended further shall not be later than six (6) months from the Execution Date;

Encumbrances shall mean any encumbrances such as mortgage, charge, pledge, lien, hypothecation, security interest, assignment, privilege or priority of any kind having effect of security or other such obligations on the Project Site, Plant and Assets if any constructed by the Concessionaire for such Plant;

Estimated Project Cost shall include cost of land, material, labor, transport, consumables, testing, commissioning, overheads, sundries, contingencies, insurance, supervision etc. for construction of the Plant and shall not be an amount less than PKR 6,569,944,971;

Execution Date shall mean the date on which the Concession Agreement is executed between the NIP and the Concessionaire;

Financing Agreements shall mean the agreements that shall be executed between Lenders and Concessionaire for financing the Project;

Financial Closure shall mean the date on which the Financial Agreement between the Lenders and Concessionaire have been duly executed;

Financial Capacity shall have the meaning ascribed to it in the RFP for the purposes of this Concession Agreement;

Force Majeure shall have the meaning as described in Article 17.1 to this Concession Agreement;

Gas means the fuel to be supplied by NIP to the Concessionaire on a best efforts basis for the operations of the Plant; this is inclusive of alternative fuel such as Diesel and LPG;

Good Industry Practice shall mean the recognized best practice methods and standards, that are followed in general in every industry and shall be followed by the Concessionaire on any particular issue, requirements or in discharging his obligations here under;

GOP shall mean the Government of Pakistan;

Independent Expert shall mean an expert appointed in accordance with Article 8 to this Concession Agreement having the requisite expertise and experience to certify the Construction Completion of the Plant;

Indirect Political Event shall have the meaning ascribed to it in clause 17.3 to this Concession Agreement;

Insurance Policy(ies) shall mean the contracts and policies of insurance taken out and maintained by the Concessionaire with respect to the Project Site, Plant and Assets in terms of this Concession Agreement;

Lead Member shall mean Mahmoud ul Haq holding at least fifty one percent (51%) of control / voting rights in the Concessionaire;

Lease Deed shall mean a lease deed executed between the NIP and the Concessionaire prior to handing over the possession of the Project Site;

Lenders shall mean the financial institutions, banks from which the Concessionaire may finance a debt as per the terms of the Financing Agreement for financing the Project;

Letter of Intent shall mean the letter issued by the NIP to the Successful Bidder dated 15 Oct 2010 intimating its intent to award the Project to the Successful Bidder;

Material Adverse Effect means circumstances which may or does (a) render any right vested in a Party by the terms of this Concession Agreement ineffective or (b) adversely affects or restricts or frustrates (i) the ability of any Party to observe and perform in a timely manner its obligations under this Concession Agreement or (ii) the legality, validity, binding nature or enforceability of this Concession Agreement;

Material Breach means a breach of the obligations or terms and conditions of this Concession Agreement by a Party, which has a Material Adverse Effect;

Minimum Technical Specifications shall mean the minimum and prescribed norms and standards of the concerned Statutory Authority, Issued from time to time, for establishment and operation of the Institutes;

Module means in respect of the Plant, each independent gas-fired generation unit of the Plant capable of producing electric power of such capacity as may be mutually agreed between the Parties;

NIP Event of Default shall have the meaning specified in article 18.1(a) to this Concession Agreement;

Operation Commencement Certificate shall mean a certificate to be issued by NIP to the Concessionaire to commence the operations of the Plant or any Module thereof and such Operation Commencement Certificate shall be issued only upon submitting the Construction Completion Certificate by the Concessionaire and shall be issued in respect of the Plant or such Module of the Plant in respect of which a Construction Completion Certificate has been issued;

Operation Phase shall mean a period starting from the Completion and Operations Date of the Plant, and where the Plant has been set up in a modular form, shall start for each Module on the date on which the Construction Completion Certificate for such Module has been issued, and shall be valid until the expiry of the Concession Period or any extension or termination thereof in accordance with the terms of this Concession Agreement;

Operation Phase Performance Security shall mean the irrevocable and unconditional insurance guarantee equivalent to (5%) of the Average Estimated Annual Billing to be provided by the Concessionaire in accordance with the terms of this Concession Agreement in the form provided in **Schedule E**, within fifteen (15) days from obtaining the Construction Completion Certificate from the Independent Expert by the Concessionaire;

Person shall mean any natural person, firm, company, governmental authority, Statutory Authority, society, trust or any legal entity;

Phase 1 Period means the period starting from the Effective Date and continuing until (i) the entire Plant capacity of 48 MW has been commissioned, or (ii) fifteen (15) years from the Effective Date whichever comes earlier;

Phase 2 Period means the period starting from the expiry of the Phase 1 Period and continuing for a period of twenty (20) years thereafter;

Primary Power Purchasers shall bear such meaning as ascribed to the term in Recital B;

Project shall bear such meaning as ascribed to the term in the Recitals;

Project Agreements shall mean (i) this Concession Agreement, (ii) Lease Deed, (iii) construction agreement executed between the Concessionaire and the Contractor; (iv) any other material contracts or agreements entered into by the Concessionaire for implementing the Project and designated in writing as a project agreement after taking a prior written approval of NIP;

Proprietary Material shall mean such the material that has been conceived, designed, written, produced or developed by the Party himself or through an external agency for a consideration and on which the Party enjoys and can establish proprietary rights under the Applicable Laws and for this Concession Agreement shall include Drawings;

Provisional Permission shall mean provisional permission granted by NIP to the Concessionaire in terms of clause 12.1 (d) of this Concession Agreement;

Project Site shall mean land situated at Korangi Creek Industrial Park to be acquired and/or leased to the Concessionaire as per the terms of this Concession Agreement;

Reasons for Refusal shall have the meaning ascribed in clause 5.1.2 to this Concession Agreement;

RFP shall bear such meaning as ascribed to the term in Recital B;

Secondary Power Purchaser(s) shall bear such meaning as ascribed to the term in Recital B;

Statutory Authority shall mean empowered organizations, Government bodies, etc;

Substitution Agreement shall mean an agreement to be executed between the NIP, the Lenders and the Substitute Entity in accordance with the provisions of clause 18.3 (a) to discharge the obligations of the Concessionaire under this Concession Agreement;

Substitute Entity shall mean a legal entity nominated by the Lenders as per the terms of the Financing Agreements to substitute the Concessionaire, and approved and appointed by NIP for implementing the Project subject to such legal entity meeting the Financial Capacity and Technical Capacity specified in the RFP and undertaking to discharge the obligations of the Concessionaire under this Concession Agreement;

Successful Bidder shall mean the Bidder whose Bid is selected based on the bid evaluation parameters specified in the RFP;

Tariff shall mean the pricing tariff proposal submitted by the Concessionaire as part of the Bid setting down the pricing mechanism on the basis of which the Concessionaire will generate bills for energy supplied to the Primary Power Purchasers;

Technical Capacity shall have the meaning ascribed to it in the RFP for the purposes of this Concession Agreement;

Termination Notice shall have the meaning ascribed to it in clause 17.9 to this Concession Agreement;

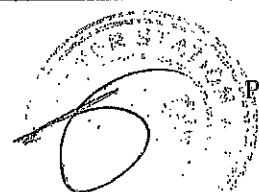
Third Party shall mean any party other than the NIP and the Concessionaire who is not a party to this Concession Agreement;

Transfer Date shall bear such meaning as ascribed to the term in clause 16.2 of this Concession Agreement.

1.2 Rules of Interpretation

1.2.1 In this Agreement:

- (a) Headings are only for convenience, and shall be ignored in construing this Agreement;
- (b) The singular includes the plural and vice versa;
- (c) References to Articles, Sections, Recitals and Schedules are, unless the context otherwise requires, references to Articles, Sections and Schedules to this Agreement;
- (d) Unless the context requires otherwise, references to times and dates are, and shall be construed to be, references to Pakistan Standard Time;
- (e) Unless otherwise provided herein, whenever a consent or approval is required by one (1) Party from the other Party, such consent or approval shall not be unreasonably withheld or delayed;
- (f) In carrying out its obligations and duties under this Agreement, each Party shall have an implied obligation of good faith;
- (g) Reference to any legislation or legislative provision includes any statutory modification or re-enactment of or legislative provision substituted for, and any subordinate legislation under, that legislation or legislative provision; and
- (h) Except as expressly provided herein, nothing shall be construed or interpreted as limiting, diminishing or prejudicing in any way the rights of any Party to claim any benefit provided under the Laws of Pakistan (whether in effect now or in the future).



ARTICLE 2: SCOPE OF THE PROJECT

2.1 Scope of the Project

2.1.1 The scope of the Project (the "Scope of the Project") shall mean and include during the Concession Period:

- (a) The Concessionaire shall design, build, construct, install, commission, operate, manage and maintain the Plant in accordance with the drawings, designs and technical specifications indicated by NIP during the Concession Period or such extended periods as may be approved by NIP and following COD, shall supply energy to the Primary Power Purchasers during the Concession Period, provided that any surplus energy remaining after meeting the requirements of the Primary Power Purchasers may be supplied to the Secondary Power Purchaser(s) during the Concession Period subject to compliance with all Applicable Laws. Billing in respect of the electric power supplied by the Concessionaire to the Primary Power Purchasers and/or the Secondary Power Purchaser(s) shall be carried out directly by NIP based on usage details provided by the Concessionaire and in accordance with the Tariff submitted by the Concessionaire in the Bid. The bills / invoices raised by the Concessionaire shall be exclusive of the cost of Gas, which will be supplied by NIP. The Concessionaire shall not be permitted to, under any circumstance, bill the Power Purchaser(s) directly other than where specifically instructed in writing by NIP. Following expiry of the Concession Period, the Concessionaire shall dismantle and remove, at its own costs, the Plant and the Assets from the Project Site and hand over peaceful possession of the Project Site to the Concessionaire in accordance with Article 16 of this Concession Agreement. Alternatively, NIP shall have the option to purchase the Plant and the Assets for a value determined in accordance with Article 16 of this Concession Agreement.

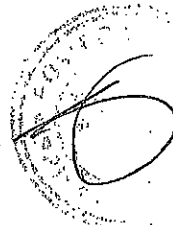
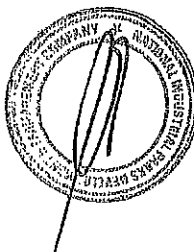
- (b) Perform and fulfil all the obligations of the Concessionaire in accordance with the provisions of this Concession Agreement.

2.1.2 Modular implementation of the Project

- (a) Notwithstanding anything contained in clause 2.1.1, the Concessionaire will be entitled, where so requested by NIP, to design, build, construct, install and commission the Plant in Modules provided that the Concessionaire shall ensure that (a) at all times the aggregate net capacity of the Modules shall be sufficient to meet the energy requirements of the Primary Power Purchasers, (b) the Plant shall meet such minimum Plant capacity requirements as may be notified by NIP.
- (b) Where NIP requires the Concessionaire to design, build, construct, install and commission the Plant in Modules, it will notify the Concessionaire of the additional load requirements of NIP up to the aggregate limit of 48 MW and the Concessionaire shall, within a period of three (3) days provide to NIP details as to the time required by the Concessionaire to set up

such additional load along with all such other information as may be requested by NIP. The Parties will have a period of thirty (30) days to discuss specific details in respect of the additional load requirement request of NIP and construction for the Module to meet such additional load requirement will begin immediately upon the expiry of the thirty (30) days discussion period.

For the avoidance of any doubt, the Concessionaire is under an obligation to design, build, construct, install and commission the Plant up to a minimum capacity of 48 MW and any failure on the part of the Concessionaire to initiate the designing, construction, installation and/or commissioning of any Module in accordance with the instructions of NIP shall amount to a Concessionaire Event of Default.



ARTICLE 3: GRANT OF CONCESSION

3.1 The Concession

3.1.1 In accordance with the provisions of this Concession Agreement, the Applicable Laws and the Applicable Approvals, NIP hereby grants to the Concessionaire and the Concessionaire hereby accepts, the exclusive right, authority and authorization during the Concession Period, including extension thereof, to use the Project Site to design, build, construct, install, commission, operate, manage and maintain the Plant under the Project, and to use the Gas, the supply of which has been arranged by NIP, to generate energy for onward sale to the Primary Power Purchasers and, in the case of any surplus energy, to the Secondary Power Purchaser(s) (the "Concession"), for the duration of the Concession Period and any extension thereof, commencing from the Effective Date, and the Concessionaire hereby accepts the Concession and agrees to implement the Project subject to and in accordance with the terms and conditions set forth herein. For avoidance of doubt, it is clarified that at all times the Project Site shall remain the property of NIP and the Concessionaire shall maintain the Project Site in good condition till the end of the Concession Period. The Concessionaire will not be permitted to create any Encumbrances over the Project Site or sell, transfer, further sub-lease or create any interest in favors of any person over the Project Site or the Concessionaire's interests therein.)

It is further clarified that NIP has agreed to provide Gas to the Concessionaire as and when the same is available. Where, however, supply of Gas is not available to NIP, the Concessionaire will be required to operate the Plant on alternate fuel and will be entitled to charge a Tariff for sale of electric power based on the alternate fuel instead of Gas. NIP will be responsible for the procurement and storage of alternate fuel in such quantities as may be required, or instructed by Concessionaire, to ensure that continuity of the Plant operations are not affected, hindered or interrupted.

- 3.1.2 Subject to and in accordance with the provisions of this Concession Agreement, the Concession hereby granted shall oblige or entitle the Concessionaire to:
- (a) Subject to the restrictions contained in clause 3.1.1 above, enjoy complete and uninterrupted right of way, access, and full possession of the Project Site for a period that shall be co-terminus with the Concession Agreement;
 - (b) Design, build, construct, install, commission, operate, manage and maintain the Plant at the Project Site as per the terms of this Concession Agreement;
 - (c) Produce energy for sale to the Primary Power Purchasers, and where there is surplus energy available after the requirements of the Primary Power Purchaser have been met in full, sell such surplus energy to the Secondary Power Purchaser(s);

- (d) Maintain and use the Project Site and use such Project Site for carrying out the implementation of the Project;
- (e) Obtain all relevant approvals and permission to enable it to carry out the Project and to produce and sell energy in terms of this Concession Agreement;
- (f) Fulfil its obligations under this Concession Agreement, undertake activities either by itself or through subcontracting arrangements and to appoint Contractors, sub-contractors, agents, advisors and consultants, without in any way discharging or relieving the Concessionaire of its duties and obligations as set out in this Concession Agreement and any liability arising out of appointment of Contractors, sub-contractors, agents, advisors and consultants shall be borne by the Concessionaire; and
- (g) Bear and pay all costs, expenses and charges in connection with or incidental to the performance of the obligations of the Concessionaire under this Concession Agreement.

3.2 Concession Period

- 3.2.1 The Concession Period shall commence from the Effective Date and shall be valid for a period that is equivalent to the aggregate of the Phase 1 Period and the Phase 2 Period or as the same may be extended subject to the mutual consent of the Parties or in accordance with the provisions of this Concession Agreement.

3.3 Actions in Support of the Concession

- 3.3.1 NIP shall on or prior to the Effective Date enter into a Lease Deed with the Concessionaire, in the form provided at **Schedule C** of this Concession Agreement, to lease the Project Site on 'as is where is' basis to the Concessionaire. Subject to clause 3.1.1 and clause 4.1.5(b) of this Concession Agreement, the physical possession of the Project Site shall be handed over to the Concessionaire within six (6) months from the Execution Date. Provided that NIP shall inform the Concessionaire two (2) months in advance, the date on which the physical possession of the Project Site will be handed over to the Concessionaire. (The Lease Deed for the Project Site will be co-terminus with the Concession Agreement.)
- 3.3.2 For the purpose of financing the Project, the Concessionaire shall have the right to mortgage, hypothecate, or otherwise encumber to Lenders its rights and interests in the Plant to be set up by the Concessionaire under or pursuant to this Concession Agreement including the cash flows generated from the sale of energy generated by the Plant, or any other receivables of the Concessionaire (the "Receivables") provided that the mortgage, hypothecation or any other Encumbrance created in the Plant by the Concessionaire shall not be for a period beyond the Concession Period. Notwithstanding anything contained herein above, the Concessionaire shall not mortgage, hypothecate or otherwise create any

Encumbrance over the Plant and/or the Receivables of the Concessionaire in favor of any third party other than the Lenders.

- 3.3.3 It is agreed that the Concessionaire shall solely be responsible to arrange the finance for the Project and the NIP shall not be liable nor assist in any manner to arrange the finance for the Project. The Concessionaire shall not in any manner enter into any arrangement with the Lenders that shall materially and adversely affect the rights and interests of NIP hereunder or impose additional liabilities on the Project and any liability arising out of the arrangement with the Lenders shall be solely borne by the Concessionaire. For the avoidance of doubt it is clarified that the Concessionaire shall not assign and/or charge and/or mortgage and/or encumber in favor of the Lenders or any other party any right, benefit and interest in the Project Site handed over to the Concessionaire as part of the Concession granted under this Agreement.
- 3.3.4 The NIP shall render such assistance as the Concessionaire may reasonably require, from time to time, for availing and obtaining all Applicable Approvals and for completion of formalities relating to the Project provided the Concessionaire is in compliance with the rules, regulations and guidelines prescribed by the Statutory Authorities;
- 3.3.5 The NIP undertakes not to terminate or repudiate this Concession Agreement prior to the expiry of the Concession Period otherwise than in accordance with the provisions of this Concession Agreement;
- 3.3.6 The NIP shall provide all assistance and recommendations to the Statutory Authority, including the GOP, in support of the Concessionaire's applications for Applicable Approvals that may be needed from time to time for the implementation of the Project provided that the Concessionaire has made the requisite applications and is in compliance with the necessary norms and regulations of the Statutory Authority for the grant of such Applicable Approvals.

ARTICLE 4: CONDITIONS PRECEDENT

4.1 Conditions Precedent

4.1.1 Save and except as expressly provided herein, the respective rights and obligations of the Parties under this Concession Agreement shall be subject to the satisfaction in full of the conditions precedent specified in this clause 4.1 prior to the Effective Date.

4.1.2 Conditions Precedent to be fulfilled by Concessionaire:

- (a) [Intentionally left blank];
- (b) Subject to clause 4.1.5(c), the Concessionaire shall before the Effective Date, achieve the Financial Closure of the Project and intimate the same to NIP;
- (c) The Concessionaire shall provide to NIP within thirty (30) days from the Execution Date, a Construction Phase Performance Security in the form of an irrevocable and unconditional insurance guarantee, in the form as has been provided in **Schedule D** to this Concession Agreement, of an amount equal to [USD 655/- (United States Dollars Six hundred and fifty five only)] for each MW of Plant capacity to be constructed and commissioned by the Concessionaire in terms of this Concession Agreement, issued by an insurance company acceptable to NIP. Eighty percent (80%) of each such Construction Phase Performance Security shall be released by the NIP in the manner provided in clause 6.2.2 of this Concession Agreement upon achieving Construction Completion of the Module against which such Construction Phase Performance Security has been provided and the remaining twenty percent (20%) of each Construction Phase Performance Security will be released within a period of thirty (30) days from Construction Completion of the relevant Module. Upon the issuance of the Construction Phase Performance Security for the entire Plant or the first Module of the Plant, as the case may be, NIP shall release the Bid Security provided by the Concessionaire;
- (d) The Concessionaire shall furnish and submit the Drawings of the Plant to be built by the Concessionaire under the Project to the NIP and the Independent Expert within three (3) months from the date of handing over the possession of the Project Site to the Concessionaire and shall carry out any modifications / additions, as may be suggested by NIP, within one (1) month from receipt of such suggestions in writing;
- (e) The Concessionaire shall have obtained the Applicable Approvals required to be obtained in order to enable the Concessionaire to carry out its functions and perform the services as required in terms of this Concession Agreement; and

4.1.3 Conditions Precedent to be fulfilled by NIP

Before the Effective Date NIP shall:

- (a) Subject to clause 5.1.2 of this Concession Agreement execute a Lease Deed with the Concessionaire (in the form provided at **Schedule C**) for the Project Site on a 'as is where is' basis, in accordance with the terms and conditions of this Concession Agreement and the handing over of possession and access to the Project Site to the Concessionaire by NIP, provided that the Concessionaire shall have given to the NIP, the Construction Phase Performance Security as set forth in clause 4.1.2 above;
- (b) Appoint an Independent Expert within three (3) months from the Execution Date to supervise and certify the completion of the construction of the Plant by the Concessionaire as per the Drawings submitted by the Concessionaire with the NIP and the Independent Expert.

For avoidance of doubt, it is clarified that the fees of the Independent Expert shall be borne by the Concessionaire. The Concessionaire shall deposit such fees as intimated by NIP on or before the 5th of every month with the NIP and NIP in turn shall pay the fees to the Independent Expert.

4.1.4 Each Party shall make all reasonable endeavors to satisfy the Conditions Precedent within the time stipulated and shall provide the other Party with such reasonable cooperation as may be required to assist that Party in satisfying the Conditions Precedent for which that Party is responsible.

4.1.5 **Non-fulfilment of the Conditions Precedent**

- (a) In the event that any of the Conditions Precedent relating to a Party have not been fulfilled within the period from the Execution Date until the Effective Date ("**Compliance Period**") as prescribed in clause 4.1.2 and 4.1.3 herein above, either Party may, notwithstanding anything to the contrary in this Concession Agreement, extend the time period for satisfying the Conditions Precedent as specified herein below. Provided any extension of a Condition Precedent shall not render this Concession Agreement invalid.
- (b) In the event that NIP is unable to execute a Lease Deed and hand over peaceful possession of the Project Site to the Concessionaire within six (6) months from the Execution Date, the Concessionaire agrees that the period of six (6) months shall automatically extend for a further period of three (3) months beyond the six (6) months period, for leasing the Project Site.

However at the end of such extended three (3) months, if NIP is unable to lease and hand over the Project Site to the Concessionaire this shall result in a NIP Event of Default and in such event the Concessionaire shall be entitled to terminate this Concession Agreement. In case of termination of this Concession Agreement by Concessionaire under this clause, NIP

shall forthwith refund the Construction Phase Performance Security provided by the Concessionaire.

- (c) In the event that the Concessionaire is unable to achieve the Financial Closure within six (6) months from the Execution Date, NIP, in its sole discretion may further extend the period for achieving Financial Closure by three (3) months. However, non-achievement of Financial Closure during such extended three (3) months shall result in a Concessionaire Event of Default and NIP shall in such event terminate this Concession Agreement. Without prejudice to any rights available under this Concession Agreement in the event of a termination of this Concession Agreement by NIP following a Concessionaire Event of Default, NIP shall be entitled to invoke any Construction Phase Performance Security furnished by the Concessionaire.
- (d) In the event NIP has terminated this Concession Agreement due to non fulfilment of any Condition Precedent by the Concessionaire, NIP shall not be liable in any manner whatsoever to the Concessionaire or its Contractors, agents and employees. Without prejudice to any rights available under this Concession Agreement, upon termination, NIP shall invoke the Construction Phase Performance Security furnished by the Concessionaire.
- (e) Upon termination of this Concession Agreement and in the event NIP shall have executed and delivered a Lease Deed and handed over the possession of the Project Site to the Concessionaire, the Lease Deed will automatically terminate and the Project Site shall immediately revert to NIP free of Encumbrances and without any liability whatsoever from any Parties and the Concessionaire and/or the Lenders shall have no claims over the Project Site.

ARTICLE 5: POSSESSION AND ACCEPTANCE OF PROJECT SITE

5.1 Handing over Possession of the Project Site

5.1.1 The NIP will hand over the full and peaceful possession of the Project Site on 'as is where is' basis to the Concessionaire. The physical possession of the Project Site shall be handed over to the Concessionaire within six (6) months from the Execution Date unless the six (6) month period is further extended by an additional three (3) months period. Provided that NIP shall inform the Concessionaire two (2) months in advance, the date on which the physical possession of the Project Site will be handed over to the Concessionaire and provided further that the Concessionaire shall have furnished to the NIP, the Construction Phase Performance Security as set forth in clause 4.1.2 above. It is acknowledged by the Concessionaire that the Project Site is being leased to the Concessionaire subject to clause 3.1.1 above of this Concession Agreement.

5.1.2 Acceptance of Project Site

- (a) The Concessionaire may within seven (7) days of making available such Project Site express in writing to NIP and the Independent Expert, its acceptance / refusal to take possession of the Project Site awarded for the Project along with reasons for refusal (if applicable).
- (b) The Concessionaire may only refuse to accept possession of the Project Site in the following circumstances ("**Reasons for Refusal**"):

 - (i) If the Project Site does not have any approach road and/or essential facilities such as power and water. For the avoidance of doubt it may be noted that NIP will only be under a duty to make available such power on the Project Site as is necessary for the Concessionaire to build, construct and install the Plant at the Project Site; and
 - (ii) If the Project Site is not appropriate or suitable for laying foundation and carrying out civil constructions for the Plant.

- (c) On receipt of communication, if any, from the Concessionaire with regard to refusal to accept the Project Site, the Independent Expert shall examine the Project Site and accept or reject such reasons for refusal of possession of Project Site. The decision of the Independent Expert shall be final and binding on both the Parties.
- (d) In the event the Independent Expert accepts the Reasons for Refusal given by the Concessionaire, the NIP shall have the option to provide an alternate Project Site within a period of thirty (30) days from the date of acceptance of Reasons for Refusal by the Independent Expert. In case the NIP determines that it does not wish to provide any alternate Project Site to the Concessionaire or is unable to provide an

alternate Project Site to the Concessionaire within the stipulated time line of thirty (30) days, this Concession Agreement shall immediately stand terminated with no costs to either Party.

- (e) In the event the Independent Expert rejects the Reasons for Refusal given by the Concessionaire, the Concessionaire shall be obliged to take possession of the Project Site and implement the Project as per the provisions of the Concession Agreement. In case the Concessionaire fails to take possession of the Project Site within a period of forty five (45) days from the date of refusal of Reasons for Refusal by the Independent Expert, NIP shall be entitled at its option to terminate this Concession Agreement and the Construction Phase Performance Security(ies) furnished by the Concessionaire shall be invoked by NIP.

5.1.3 Access to Project Site

Following the handing over of the full and peaceful possession of the Project Site the Concessionaire shall, at all times and upon reasonable notice, afford to the representatives of NIP duly authorized by NIP and the Independent Expert to access and inspect the Project Site.

ARTICLE 6: BID SECURITY AND CONSTRUCTION PHASE PERFORMANCE SECURITY

6.1 Bid Security

- 6.1.1 Both Parties acknowledge that the Concessionaire has provided NIP with a Bid Security in accordance with the provisions of the RFP. The Bid Security shall be released by NIP upon the provision of the Construction Phase Performance Security in terms of clause 4.1.2(c) and clause 6.2 of this Concession Agreement.
- 6.1.2 NIP shall have the right to forthwith en-cash the Bid Security upon termination or attempted termination by the Concessionaire of this Concession Agreement or the occurrence of any Concessionaire Event of Default provided that such termination or attempted termination or the occurrence of the Concessionaire Event of Default shall have taken place prior to the Construction Phase Performance Security being provided.
- 6.1.3 If the Concessionaire fails to maintain the Bid Security until the Construction Phase Performance Security is in place, it shall constitute a Concessionaire Event of Default that shall entitle the NIP to terminate this Concession Agreement forthwith.

6.2 Construction Phase Performance Security

- 6.2.1 For due and faithful performance of its obligations during the Construction Phase under this Concession Agreement, the Concessionaire shall provide the NIP within such time as prescribed by NIP, a Construction Phase Performance Security in the form of an irrevocable and unconditional insurance guarantee of an amount equal to [USD 655/- (United States Dollars Six hundred and fifty five only)] per MW for each Module to be constructed in terms of this Concession Agreement to be issued by an insurance company acceptable to NIP. Each Construction Phase Performance Security provided to NIP by the Concessionaire shall have a validity of thirty (30) days following the COD for each respective Module.
- 6.2.2 On successful completion of the Construction Phase and COD in respect of each Module being achieved, the Construction Phase Performance Security for that completed Module shall be released by NIP to the Concessionaire in the following manner:
 - (a) Eighty percent (80%) of the Construction Phase Performance Security provided in respect of any Module will be released upon Construction Completion of the said Module;
 - (b) The remaining twenty percent (20%) of the Construction Phase Performance Security provided in respect of any Module will be released within a period of thirty (30) following Construction Completion of each relevant Module;

For avoidance of doubt it is clarified that the Construction Completion shall be linked to the approved Drawings building plans, layouts and specifications submitted to and approved by

the NIP and the Concessionaire shall furnish the appropriate documents supporting Construction Completion such as the Construction Completion Certificate issued by the Independent Expert, as may be required by NIP, prior to the release of such Construction Phase Performance Security.

- 6.2 If the Concessionaire fails to provide and/or replenish any Construction Phase Performance Security by the date required in this Concession Agreement, it shall constitute a Concessionaire Event of Default that shall entitle the NIP to terminate this Concession Agreement forthwith.

ARTICLE 7: OPERATION PHASE PERFORMANCE SECURITY

7.1 Operation Phase Performance Security

7.1.1 For due and faithful performance of its obligations during the Operation Phase under this Concession Agreement, the Concessionaire shall provide to NIP within a period of fifteen (15) days from obtaining the Construction Completion Certificate in respect of any Module from the Independent Expert, an Operation Phase Performance Security in the form of an irrevocable and unconditional insurance guarantee of an amount equal to five percent (5%) of the Average Estimated Annual Billing of that Module, issued by an insurance company acceptable to NIP. The Concessionaire shall increase the amount of the Operation Phase Performance Security to reflect any increases in the Average Estimated Annual Billing of that Module and a failure to increase the Operation Phase Performance Security in the manner provided herein shall be a Concessionaire Event of Default and NIP may terminate this Concession Agreement as per the provisions therein. The Operation Phase Performance Security shall be maintained and valid at all times from the date of issue thereof until six (6) months following end of the Concession Period.

7.1.2 The Operation Phase Performance Security shall be released by NIP to the Concessionaire within [30] days after the expiry of six (6) months from the date of end of the Concession Period. If any amounts due to NIP from the Concessionaire are not paid off until thirty (30) days prior to the date of end of Concession Period, NIP shall have the right to en-cash the Operation Phase Performance Security to the extent of such unpaid amounts and the remaining portion of the Operation Phase Performance Security shall be released to the Concessionaire as stated above.

7.2 If the Concessionaire fails to provide and/or replenish the Operation Phase Performance Security by the date required in this Concession Agreement, it shall constitute a Concessionaire Event of Default that shall entitle the NIP to terminate this Concession Agreement forthwith.

ARTICLE 8: INDEPENDENT EXPERT

8.1 Appointment of Independent Expert

8.1.1 The NIP shall appoint a civil/electrical engineering firm from a panel of at least three (3) firms or bodies corporate known to have the requisite expertise and experience in monitoring and certifying the Construction Completion and operation, management and maintenance of the Plant (the "Independent Expert").

8.1.2 The appointment shall be made not later than three (3) months from the Execution Date and shall be valid for a period of five (5) years thereafter. On the expiry of the aforesaid period, NIP may, in its sole discretion, if deemed necessary, renew the appointment or appoint another firm from a fresh panel to be Independent Expert for a term of three (3) years.

8.2 Duties and Functions

8.2.1 The Independent Expert shall discharge its duties and functions substantially in accordance with the terms of reference set forth in **Schedule G** to this Concession Agreement.

8.2.2 The Independent Expert shall submit regular periodic reports (at least once every two weeks) to the NIP on the progress of the construction of the Plant during the Construction Phase and thereafter on the functioning, operation and maintenance of the Plant by the Concessionaire during the Operation Phase.

8.3 Remuneration

8.3.1 The remuneration, cost and expenses of the Independent Expert shall be borne by the Concessionaire.

Termination of appointment

8.4.1 NIP may terminate the appointment of the Independent Expert at any time, but only after appointment of another Independent Expert in accordance with Clause 8.1 herein above.

8.5 Authorized signatories

8.5.1 The NIP shall require the Independent Expert to designate and notify to the NIP and the Concessionaire up to two (2) persons employed in its firm to sign for and on behalf of the Independent Expert, and any communication or document required to be signed by the Independent Expert shall be valid and effective only if signed by any of the designated persons; provided that the Independent Expert may, by notice in writing, substitute any of the designated persons by any other of its employees.



8.6 Dispute resolution

8.6.1 If either Party disputes any advice, instruction, decision, direction or award of the Independent Expert, or, as the case may be, the assertion or failure to assert jurisdiction, the Dispute shall be resolved in accordance with the Dispute Resolution Procedure as provided in Article 23 to this Concession Agreement.



ARTICLE 9: OBLIGATIONS OF THE PARTIES

9.1 Obligations of NIP

- 9.1.1 The NIP, in addition to and without prejudice to its rights specified in the other provisions of this Concession Agreement, shall, without qualification, during the Concession Period, observe and comply with the following obligations:
- (a) The NIP shall at its own cost, be responsible for giving full and peaceful possession of the Project Site to the Concessionaire unless extended further, within a period of six (6) months from the Execution Date;
 - (b) Upon request from the Concessionaire, the NIP shall facilitate in procuring all Applicable Approvals which are necessary for the implementation of the Project at the appropriate stages of the Project and which are in its authority to grant or cause to be granted subject to the Concessionaire complying with the eligibility criteria or conditions, as the case may be, for such Applicable Approvals; NIP shall facilitate the process of procuring such Applicable Approvals from the Statutory Authority; and
 - (c) In the event of a Change in Law, wherein such change has a Material Adverse Effect, the Concessionaire may by notice in writing to the NIP request the NIP to make such modifications to the terms of this Concession Agreement as the Concessionaire reasonably believes are necessary to place the Concessionaire in substantially the same legal and economic position as it was prior to such Change in Law and the NIP may make best endeavors to put in effect such reasonable request of the Concessionaire.
 - (d) Make adequate standby and backup arrangements of fuel during periods of Plant breakdown and during periods where Gas supply is not guaranteed for meeting its energy supply obligations towards the Primary Power Purchasers and to meet the operation and maintenance requirements of the Plant;

9.2 Obligations of the Concessionaire

- 9.2.1 The Concessionaire, in addition to and without prejudice to its rights specified in the other provisions of this Agreement, shall, during the Concession Period, including extension thereof, without qualification, observe and comply with the following obligations:
- (a) Take over possession of the Project Site from the NIP, provided however; it has furnished the Construction Phase Performance Security in accordance with the provision of Article 4 above;
 - (b) Make or cause to be made the necessary applications to the relevant Statutory Authority for all Applicable Approvals and supply the appropriate particulars and details to such Statutory

Authority as may be necessary confirming that the Concessionaire fulfils the eligibility criteria or the conditions, as the case may be, to enable the concerned Statutory Authority to consider the request for the grant of the relevant Applicable Approval and, following the grant of any such Applicable Approval, maintain such Applicable Approval in full force and effect so long as it is necessary in order for the Concessionaire to perform its obligations hereunder;

- (c) Design, build, construct and install the Plant itself or appoint construction Contractor(s) and enter into construction agreement(s) with such Contractor(s). The Concessionaire shall build, construct and install the Plant as per the Drawings submitted by the Concessionaire and approved by NIP;
- (d) Intentionally left blank.
- (e) Appoint, employ and train all necessary and appropriate personnel to run the Plant and to generally fulfill its obligations in terms of this Concession Agreement;
- (f) Report to the NIP during the Construction Phase and Operations Phase as detailed in Article 13 such reports as detailed in clause 13.2 and 13.3, respectively of this Concession Agreement. Such reports should provide the information as is reasonably required to keep the NIP properly informed of material matters relating to the construction, installation, finance, operation and management of the Plant.
- (g) Achieve Construction Completion of each Module by no later than the time period for Construction Completion thereof as may be determined and agreed between the Parties provided that the period for Construction Completion shall begin from the date on which the Independent Engineer issues instructions to the Concessionaire on behalf of NIP to begin construction thereof and further provided that the Concessionaire shall not be in breach of this sub-clause if any non-fulfillment or delay in fulfillment of its obligations herein are caused by (i) the occurrence of an event of Force Majeure in accordance with Article 17 hereof or (ii) a NIP Event of Default;
- (h) Achieve Construction Completion of the entire Plant not later than [fifteen (15) years] from the Effective Date provided that the Concessionaire shall not be in breach of this sub-clause if any non-fulfillment or delay in fulfillment of its obligations herein are caused by (i) the occurrence of an event of Force Majeure in accordance with Article 17 hereof or (ii) a NIP Event of Default;
- (i) Ensure that (i) at all times the aggregate capacity of the Modules shall be sufficient to meet the energy requirements of the Primary Power Purchasers, (ii) the Plant shall meet such minimum Plant capacity requirements as may be notified by NIP;

- (j) Following achievement of COD in respect of each Module, the Concessionaire shall supply energy to the Primary Power Purchasers, as required by the Primary Power Purchasers, up to the extent of the capacity of that Module, at the tariff specified by the Concessionaire in the Bid. The Concessionaire will be entitled to supply any surplus energy, after meeting the energy requirements in full of the Primary Power Purchasers, to the Secondary Power Purchaser(s) pursuant to a power purchase agreement entered into between the Concessionaire and the relevant Secondary Power Purchaser in substantially the form provided at **Schedule F**;
- (k) [Intentionally left blank];
- (l) Not to transfer or dispose off or otherwise alienate any of the Assets, if any, of the Plant without the prior written approval of the NIP;
- (m) Maintain the assets, buildings, equipment and infrastructure of the Plant in accordance with the norms and standards prescribed by Good Industry Practices;
- (n) Subject to NIP choosing not to acquire the Plant and the Assets in terms of Article 16 of this Concession Agreement, the Concessionaire shall dismantle and remove the Plant in its entirety from the Project Site within six (6) months of the end of the Concession Period along with any other Assets if created by the Concessionaire on the Project Site in accordance with Article 16 of this Concession Agreement;
- (o) Allow representatives of NIP reasonable access to the Plant on the Project Site but so as not to interfere unreasonably in the construction, operation and maintenance of the Plant;
- (p) Subject to the provisions of Article 17 dealing with Force Majeure, not abandon the Project;
- (q) Provide adequate security and watch services at the Plant to maintain the safety and security to the Plant, the Project Site and the personnel present thereon and make appropriate provision and arrangement for first aid and prompt medical attention in cases of accidents and emergencies;
- (r) Maintain the requisite insurance of the Plant, as specified in this Concession Agreement and/or by NIP from time to time and provide copies of the same to the NIP. In case NIP finds that the Project is not being adequately insured by the Concessionaire, then it shall, at its own discretion, procure the same and receive the costs associated for taking such insurance from the Concessionaire within [15] days of raising of such invoice;
- (s) Promptly notify the NIP and hand over to them any archaeological finds, treasures and precious and semi-precious minerals discovered on the Project Site by the Concessionaire or its employees, agents and Contractors; and

- (t) Maintain an adequate supply of back up fuel to ensure that the continuity of the Plant operations is not affected hindered or interrupted even during days / months when Gas is not available.

9.3 Obligations of the Parties

9.3.1 Each Party shall:

- (a) Comply with and perform its respective obligations under this Concession Agreement and shall work and cooperate in good faith with the other Party with respect to all the obligations and rights hereunder of the other Party;
- (b) Agree that the title to and ownership of the Project Site shall at all times vest in NIP and shall not under any circumstance whatsoever pass over or be deemed to have passed over to the Concessionaire or Persons claiming by, under or through the Concessionaire and shall be handed back to NIP upon the expiry of the Concession Period or prior termination of the Concession Agreement; and
- (c) Agree that the title to and ownership of the Plant along with the Assets developed by the Concessionaire during the Concession Period shall at all times vest in the Concessionaire and shall not under any circumstance whatsoever pass over or be deemed to have passed over to the NIP or Persons claiming by, under or through NIP.

9.4 Obligations of the Lead Member

9.4.1 Maintaining the requisite stake and voting rights in Concessionaire

- (a) It is agreed that the Lead Member shall at all times during the Concession Period, hold and maintain at least fifty one percent (51%) control and voting rights in the Concessionaire.
- (b) The Lead Member holding at least fifty one percent (51%) control and voting rights in the Concessionaire may be substituted/replaced by another Lead Member who is at least equal or better than the original Lead Member in terms of the Financial Capacity and Technical Capacity as sought by NIP in the RFP. However, in case of Lead Member such substitution / replacement shall be made only after three (3) years from the Completion and Operations Date. Approval for change in the Concessionaire shall be required to be obtained in writing and shall be solely at the discretion of NIP;

Provided that any person replacing the Lead Member shall meet the Technical Capacity and Financial Capacity prescribed by NIP in the RFP;

Further provided that the new Lead Member replacing the original Lead Member should not have been an applicant and/or member of any other party/consortium bidding for this Project;

Further provided further that such new Lead Member expressly and in entirety adopt the constitution documents and/or by-laws, obligations and duties of the Concessionaire under this Concession Agreement, as if it were a original Bidder.

- (c) The Concessionaire may be allowed tie ups with third parties having requisite experience and expertise to implement the Project with the prior approval of the NIP. However such tie ups shall not absolve the Concessionaire from its obligations and duties under this Concession Agreement and the Concessionaire shall be solely responsible for the implementation of the Project.
- (d) Notwithstanding anything contained herein above, substitution/ replacement of the Lead Member will require a prior written approval of NIP, which shall not be unnecessarily withheld. Further until the period of three (3) years from the Completion and Operation Date and before applying for such change, the Concessionaire shall have made investments, not less than an amount equal to [80%] of its expected investments as per Minimum Technical Specifications specified in the RFP in the construction and establishment of the Plant.

9.4.2 Obligation to nominate and appoint a Government Nominee

The Lead Member holding stake and voting rights in the Concessionaire shall take all the steps necessary to nominate and appoint one NIP nominee on the board of the trustees and/or board of the members, as the case may be, of the Concessionaire till the validity of this Concession Agreement.

- 9.4.3 Failure by the Lead Member to fulfil its obligations in terms of this clause and this Concession Agreement shall constitute a Concessionaire Event of Default and the consequences specified in this Concession Agreement shall follow.

ARTICLE 10: REPRESENTATION AND WARRANTIES

10.1 Mutual Representations and Warranties

10.1.1 Each Party represents and warrants to the other Party that:

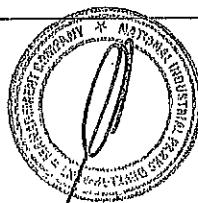
- (a) In respect to the Concessionaire only, it is duly organized, validly existing and in good standing under the laws of the jurisdiction;
- (b) It has full power and authority to execute, deliver and perform its obligations under this Concession Agreement and to carry out the transactions contemplated hereby;
- (c) It has taken all necessary action to authorize the execution, delivery and performance of this Concession Agreement;
- (d) This Concession Agreement constitutes the legal, valid and binding obligation of it, enforceable against it in accordance with the terms hereof; and
- (e) It is subject to civil and commercial law with respect to this Concession Agreement and it hereby expressly and irrevocably waives any immunity in any jurisdiction.

10.2 Further Representations and Warranties of NIP

10.2.1 The NIP further represents and warrants to the Concessionaire that there is no litigation, claim, demand or any proceeding pending before any authority in respect of the title of NIP to the Project Site except as may be notified to the Concessionaire by NIP.

ARTICLE 11: AUDITING

- 11.1 The Concessionaire is required to prepare and submit various financial statements as per statutory requirements prevailing and introduced in future.
- 11.2 The Concessionaire shall get its financial statements and accounts audited by a Chartered Accountant and ensure that a copy of its annual and semi-annual audited statements is made available to NIP within a period of one (1) week from the finalization thereof.

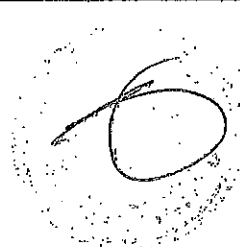
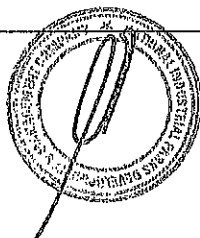


ARTICLE 12: CONSTRUCTION PHASE AND OPERATIONS PHASE**12.1 Construction of the Project**

- (a) The Concessionaire undertakes to incur all expenses in relation to construction of the Plant from the Effective Date;
- (b) The Concessionaire undertakes to design, build, construct, finance, manage, operate and maintain the Plant at its expenses in accordance with terms of Applicable Approvals and Minimum Technical Specifications specified in **Schedule H** to this Concession Agreement, or where not so specified, in accordance with Good Industry Practices;
- (c) The Concessionaire undertakes to construct the Plant on its own or through Contractor(s). The Concessionaire shall ensure that Construction Completion of the Plant is achieved in accordance with clause 9.2.1(g) above, unless NIP may in its sole discretion further extends the aforesaid period, if the Concessionaire requests NIP to do so and if it deems fit and proper. Provided that any such extension shall not be granted more than once by NIP and term for extension shall not exceed a period of [six (6) months] (the "**Cure Period**").

Provided that for each month of the Cure Period, the Concessionaire shall forfeit ten percent (10%) up to a cumulative maximum of 50% of the Construction Phase Performance Security for delay in achieving Construction Completion and at the same time replenish the forfeited ten percent (10%) of Construction Phase Performance Security by furnishing an equivalent insurance guarantee within seven (7) days immediately following the month/period of delay in achieving the Construction Completion. Failure to replenish the Construction Phase Performance Security within the time period stipulated above shall result in a Concessionaire Event of Default. Notwithstanding anything contained in this Concession Agreement, failure to achieve Construction Completion within the Cure Period shall result in a Concessionaire Event of Default under this Concession Agreement;

- (d) The Concessionaire may prior to achieving Construction Completion of the Plant or any Module, as the case may be, approach NIP for the grant of a Provisional Permission to start the Plant or any Module, as the case may be. NIP may grant such Provisional Permission that shall be valid for a period of three (3) months from the date of Provisional Permission, subject to the Concessionaire meeting the following conditions:
 - (i) The Concessionaire has applied and obtained the Approved Approvals from the concerned Statutory Authority and/or NIP, as the case may be, to start the Plant;
 - (ii) The Concessionaire has made investments of at least sixty percent (60%) from its expected investments as per the Minimum Technical Specifications specified in the RFP for the Plant.



Notwithstanding any contained above, the Provisional Permission shall not be valid beyond the COD for the Plant or any Module, as the case may be. Provided that the timelines in this clause and the percentage of investment required may be relaxed at the sole discretion of NIP.

- (e) The Concessionaire shall ensure that the construction shall comprise only materials and goods which shall be of sound quality and which shall have been manufactured and prepared and all workmanship shall be in accordance with Good Industry Practices and that each part of the works shall be fit for the purpose for which it is required as stated in or as may be reasonably inferred from the plans;
- (f) The Concessionaire acknowledges that all debris and construction and building materials (sand, gravel, stone, rock, loose earth etc.) lying or generated during Construction Phase of the Plant, if emanating from the Project Site, shall be the property of NIP. However the Concessionaire shall dispose of at its cost such debris and construction and building materials in accordance with the written instructions issued by NIP from time to time;
- (g) When the Concessionaire reasonably believes that Construction Completion has been achieved, the Concessionaire shall so notify NIP and the Independent Expert in writing. Such notice will set out the date and time and place, where the inspection and tests for Construction Completion may be carried out by the Independent Expert. However, such date for inspection shall not be earlier than seven (7) days following the date of such notice. All costs relating to such inspection and tests shall be borne by the Concessionaire. The authorized representatives of NIP, Independent Expert and Concessionaire shall have the right to attend such inspection and assessment;
- (h) On issuance of Construction Completion Certificate of the Plant or any Module thereof the Concessionaire shall commence the operations of the Plant or the Module in respect of which the Construction Completion Certificate has been issued and such date shall be the Completion and Operations Date for the Plant or the relevant Module, as the case may be.

12.2 Operations Phase – Operation and Management of the Plant

- (a) The Concessionaire will undertake the management of the Plant at its cost and in compliance with Good Industry Practices and the terms and conditions hereof, including the Minimum Technical Specifications and, provided the Concessionaire shall be obliged to take prior written consent of NIP in the form of an affirmative vote of the NIP nominee appointed on the board of the Concessionaire, before carrying out any change in the functioning, management and operation process of the Plant;
- (b) The Concessionaire may appoint a Person meeting the criteria specified in the **Schedule I** to this Concession Agreement as the operations and management contractor to operate and maintain the Plant. However, the Concessionaire shall not be absolved of its responsibilities

and duties in case of appointment of an operations and management contractor and the NIP nominee shall at all times during the Concession Period be appointed on the board of the Concessionaire;

- (c) The Concessionaire, shall at all times at its own cost and expense maintain, keep in good operating condition, repair and renew, replace and upgrade to the extent reasonably necessary the Plant, equipment and machinery, and the infrastructure facilities and systems in connection with the Plant. All maintenance, repair and works shall be carried out in such a way as to minimize outages by the Plant and shall only be carried out after prior advance notice in writing for such maintenance and repair work has been provided to NIP and has not been objected to by NIP.
- (d) NIP shall ensure the maintenance of the minimum electrical load factor as per the RFP and submitted bid.

12.3 Personnel and Employees

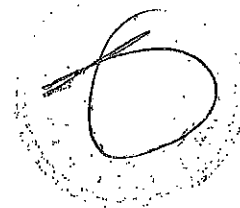
- (a) The Concessionaire shall prior to obtaining the Provisional Permission have trained and employed all necessary personnel required to run the Plant as required in terms of this Concession Agreement;
- (b) The recruitment, appointment, salary and other benefits provided to the personnel shall be as per the Applicable Laws and policies of the Government of Pakistan and NIP;
- (c) In the event the Concessionaire is required for reasons beyond its control to remove or change any key personnel, it shall do so in accordance with the Applicable Laws and shall forthwith provide replacement key personnel having qualifications acceptable as per applicable norms. However, in doing so the Concessionaire shall take into consideration that the running of the Plant is not adversely affected.

12.4 Labor

- (a) The Concessionaire shall provide and employ at the Plant for the execution of the construction works such skilled, semi-skilled and unskilled labor as is necessary for the proper and timely execution and implementation of the Project as per the terms of this Concession Agreement. The Concessionaire shall use its best endeavors to prevent any unlawful, riotous or disorderly conduct or behavior by or amongst its personnel and labor and the labor of its Contractors and/or the operations and management contractor.
- (b) The Concessionaire shall be solely and exclusively responsible for the recruitment, transportation, accommodation, catering, payment of the salaries, wages and other payments for its personnel and employees and costs whether direct and indirect, incidental thereto and all taxes, charges, levies, duties payable under Applicable Law arising from the



respective terms and conditions of employment of its personnel and labor and the labor of its Contractors and/or the operations and management contractor that is engaged and/or employed on or connected with the Concession Agreement under or through whatever legal relationship. The Concessionaire shall be further responsible for obtaining all necessary Applicable Approvals from the Statutory Authority and compliance with all Applicable Laws and regulations pertaining to the employment of labor.



ARTICLE 13: INFORMATION

13.1 Financial Information

The Concessionaire agrees to deliver to NIP, during the development and the management period, the following documents and information at the intervals described below:

- (a) Annual accounts of the Concessionaire delivered within one hundred and eighty (180) days of the end of each fiscal year;
- (b) Notification of any adverse material change in the financial condition of the Concessionaire or the Project promptly following such occurrence.

13.2 Construction Phase Reports

The Concessionaire shall during the Construction Phase of the Plant, provide to the NIP a copy of the construction schedule, and provide them fortnightly progress reports during the Construction Phase which shall include the following information:

Contents of Progress Report: the summary of the progress made till the date of delivery of such report and shall *inter alia* include the construction progress made as against the initial plan and reasons for deviations, if any, during such period. Report shall also mention any information or issues that shall significantly affect the construction of the Project.

13.3 Operations Phase Reports

The Concessionaire shall provide the NIP, an annual report during the Operations Period of the Plant, which shall contain the following information:

- (a) **Summary of progress:** Summary of operating and financial results. Pertaining to performance, costs, and expenses.
- (b) **Operations plan:** An operations plan for running and operations of the Plant for the year, a report on the activities carried out during the previous year (including a commentary on any material deviation from expected activities as set out in the operations plan), any breakdowns during the preceding year and the expected maintenance and repair work to be carried out along with planned outages for the next year.

13.4 Additional Information

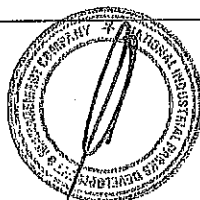
The Concessionaire agrees to provide to the NIP such further information as the NIP may reasonably request in order to monitor the progress and performance of the Project.

13.5 Other Information

The Concessionaire will provide the following information to the NIP, promptly after becoming aware of it:

- (a) **Force Majeure:** Details of any event of Force Majeure which has occurred or which is imminent and fortnightly updates with respect to it as long as it continues or is imminent;
- (b) **Litigation:** Details of any actual, pending or threatened material litigation, arbitration, claim or labor dispute relating to the Project; and
- (c) **Legislation:** Details of Change of any Applicable Law and change of condition of any Applicable Approvals and any fines or penalties that have or may thereby be incurred.

ARTICLE 14: [Intentionally Left Blank]



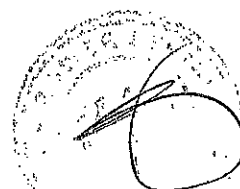
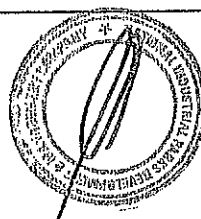
ARTICLE 15: FINANCING**15.1 Assignment and Creation of Security**

- (a) The Parties agree that the Concessionaire shall not assign or charge or encumber in favor of the Lenders any right, benefit and interest under the Project Site;
- (b) The Concessionaire may with the prior consent of the NIP create a charge or encumber in favor of the Lenders any benefit, title and interest that it has in the Plant and the Assets constructed by the Concessionaire for the purposes of enabling financing of the Project and for securing the repayment of the monies which may become payable by the Concessionaire to the Lenders, provided that such charge shall not be for a period beyond the Concession Period. For avoidance of doubt it is clarified that, creation of such charge or Encumbrance in the Plant and the Assets by the Concessionaire shall not in any way release and absolve the Concessionaire from its obligations under the Concession Agreement and any liability arising out of such Encumbrance/lien shall be solely borne by the Concessionaire.

Notwithstanding anything contained herein above, the Concessionaire shall not mortgage, hypothecate or otherwise create Encumbrance in the Plant, Project Site (along with any buildings and constructions thereon) and the Assets in favor of any third party other than the Lenders.

15.2 Accounts of Concessionaire

The Concessionaire shall keep and maintain books of accounts for the Project in accordance with standard practices and statutory requirements consistently applied in accordance with Applicable Laws.



ARTICLE 16: DISMANTLING OF PLANT / TRANSFER OF PLANT

16.1 Scope of Dismantling

Upon the expiry of the Concession Period, NIP:

- (a) may request the Concessionaire to, within six (6) months of the expiry of the Concession Period, dismantle the Plant and remove the same along with all Assets from the Project Site, and handover vacant, peaceful possession of the Project Site back to NIP, or
- (b) At the sole and complete discretion of NIP, acquire the Plant and the Assets for a price to be determined by an independent evaluator appointed by NIP and consented to by the Concessionaire.

Where NIP chooses not to acquire the Plant and the Assets in accordance with clause 16.1(b) above, the Concessionaire shall be obligated to clear the Project Site within the time period prescribed above. In the event of a failure on the part of the Concessionaire to comply with its obligations in terms of clause 16.1(a) above, NIP shall be entitled to sell the Plant and the Assets to any person and shall be well within its rights to have the Plant and Assets dismantled and removed from the Project Site at the costs and expense of the Concessionaire.

Provided that where NIP chooses to acquire the Plant and the Assets in terms of this clause, the remaining provisions of this Article 16 will apply and be followed.

16.2 Scope of Acquisition

- (a) Where NIP chooses to acquire the Plant and the Assets, it shall, within one (1) month from the end of the Concession Period, appoint an independent evaluator, in respect of whom the Concessionaire has given its consent, to assess the position and value of the Plant and the Assets. The independent evaluator shall provide its valuation of the Plant and the Assets within a period of four (4) weeks from appointment. The price determined by the independent evaluator shall be final and binding on both Parties. However, nothing herein shall be read as an obligation on the part of NIP to acquire the Plant and the Assets. If following the completion of the evaluation, NIP decides to acquire the Plant and the Assets at the value determined by the independent evaluator NIP shall notify the Concessionaire in writing of the same and shall proceed to complete the acquisition of the Plant within a period of 4 weeks from the date of the notification. If however, NIP decides to not acquire the Plant and the Assets, then NIP shall notify the same to the Concessionaire in writing and the Concessionaire will be required to dismantle and remove the Plant and the Assets from the Project Site in accordance with clause 16.1(a) and the period of six (6) months for the same will be deemed to begin from such written notice of the NIP.

- (b) Where NIP chooses to acquire the Plant and the Assets, the Concessionaire shall, upon the exercise of such option (such date hereafter referred to as the "Transfer Date"), hand over to NIP the Project Site, the Plant and the Assets created during the Concession Period, free and clear of any liability, charge and/or Encumbrances created or suffered by the Concessionaire after the Effective Date and before the end of Concession Period, all of the Concessionaire's right, title and interest in and to the Plant and the Assets constructed by the Concessionaire on the Project Site. The Concessionaire shall also deliver to NIP on such date such operating manuals, plans, design drawings and other information as may reasonably be required by NIP to enable it to continue the operation of the Plant and the Assets.

16.3 Right to NIP to choose Insurance and Contractor Warranties

NIP shall on the Transfer Date have the right to choose and retain all or any of the unexpired Insurance Policies, contractor warranties in relation to the Plant/Assets. The Concessionaire shall ensure that any rights which are to be so assigned are capable of assignment and such assignment has been approved under the terms of the relevant contract by the counterparty to the Concessionaire.

16.4 Assignment of Contracts

The NIP shall at its own discretion have the right to choose and retain on the Transfer Date all or any of the contracts, equipment contracts, supply contracts and all other contracts except service contracts with the employees of the Concessionaire, entered into by the Concessionaire and subsisting as on the Transfer Date.

16.5 Condition of the Plant upon Transfer

On the Transfer Date the Plant shall be in fair, usable / habitable and in a state of good working conditions as per Good Industry Practices, subject to normal wear and tear, having regard for the nature, construction and life span of the Plant and the Assets.

16.6 Passing of Risk

Until the Transfer Date, all risks shall lie with the Concessionaire for loss of or damage to the whole or any part of the Plant, Project Site and the Assets created by the Concessionaire during the Concession Period. On and from the Transfer Date all risks except risks arising out of service contracts, if any, in relation to the transferred Plant, Project Site and the Assets created by the Concessionaire during the Concession Period shall be deemed to have been transferred to and lie with NIP.

16.7 Transfer Costs

- (a) The Concessionaire shall transfer the Project Site, Plant along with all the Assets, at the price / value determined by the independent evaluator;
- (b) The costs and expenses, including stamp duties, taxes, legal fee and expenses incurred in connection with the transfer of the Plant and the Assets to NIP shall be borne equally by both Parties. The Concessionaire hereby undertakes to indemnify NIP against any liability arising out of any non-payment of tax liability till the Transfer Date that may be sought to be or is imposed on a later date on NIP by the income tax authorities, in relation to the Plant and the Assets there under.

16.8 Effect of Transfer

- (a) On the Transfer Date the Concessionaire shall hand over full and peaceful possession, of the Plant and the Assets to NIP and the Concessionaire, its Contractors, sub-contractors, agents, employees appointed by the Concessionaire shall vacate the Plant, the Project Site, Assets if any, constructed on the Project Site;
- (b) From the Transfer Date, the obligations and the rights of the Concessionaire under this Concession Agreement except those obligations that have arisen before the Transfer Date shall terminate and NIP shall take over the Plant and its operation and maintenance and any other rights or obligations arising out of this Concession Agreement which either expressly or implicitly survive termination of this Concession Agreement.

ARTICLE 17: FORCE MAJEURE

17.1 Force Majeure

As used in this Agreement, the expression "Force Majeure" or "Force Majeure Event" shall mean occurrence in the Islamic Republic of Pakistan of any or all of Non-Political Event, Indirect Political Event and Political Event, as defined in clauses 17.2, 17.3 and 17.4 respectively, if it affects the performance by the Party claiming the benefit of Force Majeure (the "Affected Party") of its obligations under this Agreement and which act or event (i) is beyond the reasonable control of the Affected Party, and (ii) the Affected Party could not have prevented or overcome by exercise of due diligence and following Good Industry Practice, and (iii) has Material Adverse Effect on the Affected Party.

17.2 Non-Political Event

A Non-Political Event shall mean one or more of the following acts or events:

- (a) Act of God, epidemic, extremely adverse weather conditions, lightning, earthquake, landslide, cyclone, flood, volcanic eruption, chemical or radioactive contamination or ionizing radiation, fire or explosion (to the extent of contamination or radiation or fire or explosion originating from a source external to the site of the Plant);
- (b) Strikes or boycotts (other than those involving the Concessionaire, Contractors or their respective employees/representatives, or attributable to any act or omission of any of them) interrupting supplies and services and/or the construction, operation and maintenance of the Plant for a continuous period of twenty four (24) hours and an aggregate period, exceeding thirty (30) days in a financial year, and not being an Indirect Political Event set forth in Clause 17.3;
- (c) Any judgment or order of any court of competent jurisdiction or statutory authority made against the Concessionaire in any proceedings for reasons other than (i) failure of the Concessionaire to comply with any Applicable Law or Applicable Permit, or (ii) on account of breach of any Applicable Law or Applicable Permit or of any contract, or (iii) enforcement of this Agreement, or (iv) exercise of any of its rights under this Agreement by the NIP;
- (d) The discovery of geological conditions, toxic contamination or archaeological remains on the Project Site that could not reasonably have been expected to be discovered through inspection; or
- (e) Any event or circumstances of a nature analogous to any of the foregoing.

17.3 Indirect Political Event

An Indirect Political Event shall mean an act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, riot, insurrection, terrorist or military action, civil commotion or politically motivated sabotage which prevents operation of the Plant by the Concessionaire for a period exceeding a continuous period of thirty (30) days in a financial year.

17.4 Political Event

A Political Event shall mean one or more of the following acts or events by NIP or the GOP:

- (a) Compulsory acquisition in national interest or expropriation of the Project Site or the Assets, if any created by the Concessionaire under the Project or rights of the Concessionaire;
- (b) Unlawful or unauthorized or without jurisdiction revocation of, or refusal to renew or grant without valid cause, any clearance, license, permit, authorization, no objection certificate, consent, approval or exemption required by the Concessionaire to perform their respective obligations under this Concession Agreement; provided that such delay, modification, denial, refusal or revocation did not result from the Concessionaire's inability or failure to comply with any condition relating to grant, maintenance or renewal of such clearance, license, authorization, no objection certificate, exemption, consent, approval or permit; or
- (c) Any event or circumstance of a nature analogous to any of the foregoing.

17.5 Duty to report Force Majeure Event

- (a) Upon occurrence of a Force Majeure Event, the Affected Party shall by notice report such occurrence to the other Party forthwith. Any notice pursuant hereto shall include full particulars of:
 - (i) The nature and extent of each Force Majeure Event with evidence in support thereof;
 - (ii) The estimated duration and the effect or probable effect which such Force Majeure Event is having or will have on the Affected Party's performance of its obligations under this Agreement;
 - (iii) The measures which the Affected Party is taking or proposes to take for alleviating the impact of such Force Majeure Event; and
 - (iv) Any other information relevant to the Affected Party's claim.
- (b) The Affected Party shall not be entitled to any relief for or in respect of a Force Majeure Event unless it shall have notified the other Party of the occurrence of the Force Majeure Event as soon as reasonably practicable, and in any event not later than seven (7) days after

the Affected Party knew, or ought reasonably to have known, of its occurrence, and shall have given particulars of the probable material effect that the Force Majeure Event is likely to have on the performance of its obligations under this Agreement.

- (c) For so long as the Affected Party continues to claim to be materially affected by such Force Majeure Event, it shall provide the other Party with regular (and not less than weekly) reports containing information as required by clause 17.5.1, and such other information as the other Party may reasonably request the Affected Party to provide.

17.6 Effect of Force Majeure Event on the Concession

The Concessionaire shall be eligible for extensions as provided hereunder only on the occurrence of Force Majeure Events not resulting in Termination, with respect to the Project. At any time after the Effective Date, if any Force Majeure Event occurs:

- (a) Before COD, the Concession Period and the Construction Phase shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists; or
- (b) After COD, whereupon the Concessionaire is unable to operate and maintain the Plant and supply energy to the Primary Power Purchasers and/or the Secondary Power Purchaser(s) despite making best efforts, the Concession Period shall be extended by a period, equal in length to the period during which the Concessionaire was prevented from operating the Plant and supply energy as stated above on account thereof.

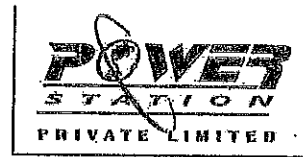
- 17.7 Save and except as expressly provided in this Article 17, neither Party shall be liable in any manner whatsoever to the other Party in respect of any loss, damage, cost, expense, claims, demands and proceedings relating to or arising out of occurrence or existence of any Force Majeure Event or exercise of any right pursuant hereto.

17.9 Minor Force Majeure Event

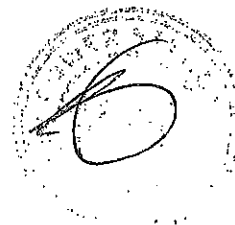
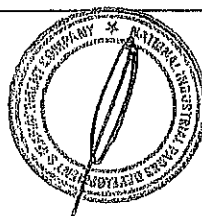
Any Force Majeure Event subsisting for a period between seven (7) days and thirty (30) days shall be considered as minor Force Majeure Event and no time extension shall be granted.

17.10 Termination Notice for Force Majeure Event

If a Force Majeure Event subsists for a continuous period of three hundred and sixty five (365) days, NIP may in its discretion terminate this Concession Agreement by issuing a written notice (the "Termination Notice") to the Concessionaire without being liable in any manner whatsoever, save as provided in this Article 17, and upon issue of such Termination Notice, this Concession Agreement shall, notwithstanding anything to the contrary contained herein, stand terminated forthwith, provided that before issuing such Termination Notice, NIP shall inform the Concessionaire of such intention and grant thirty (30) days time to make a representation, and may after the expiry of such



thirty (30) days period, whether or not it is in receipt of such representation, in its sole discretion
Issue the termination Notice.



ARTICLE 18: EVENTS OF DEFAULT

18.1 NIP Event of Default

- (a) Each of the following events or circumstances, to the extent not caused by a default of the Concessionaire or Force Majeure, shall be considered for the purposes of this Concession Agreement as events of default of the NIP (the "**NIP Event of Default**") which, if not cured within the time period permitted, if any, shall provide the Concessionaire with the right to terminate this Concession Agreement in accordance with Article 18 hereof:
- (i) Failure of NIP to hand over physical possession of the Project Site in accordance with the terms of this Concession Agreement;
 - (ii) A Material Breach by NIP of its obligations under this Concession Agreement which is not remedied within ninety (90) days of receipt of written notice from the Concessionaire specifying such breach and requiring the NIP to remedy the same;
 - (iii) A breach of any express representation or warranty by NIP which has a Material Adverse Effect and such breach is not remedied within ninety (90) days of receipt of written notice from the Concessionaire specifying such breach and requiring NIP to remedy the same.

18.2 Concessionaire Event of Default

- (a) Each of the following events or circumstances, to the extent not caused by a default of NIP or Force Majeure, shall be considered for the purposes of this Concession Agreement as Events of Default of the Concessionaire (the "**Concessionaire Event of Default**") which, if not cured within the time period permitted, if any, shall provide the NIP, with the right to terminate this Concession Agreement in accordance with Article 18 hereof:
- (i) A Material Breach of its obligations under the Concession Agreement which has a Materially Adversely Effect on the NIP or the Project and such breach is not remedied within ninety (90) days of receipt of written notice from NIP specifying such breach and requiring the Concessionaire to remedy the same;
 - (ii) Such events as have been specified as Concessionaire Events of Default under the provisions of the Concession Agreement;
 - (iii) Subject to the provisions of clause 5.1.2 to this Concession Agreement failure to take possession of the Project Site within the time period prescribed in this Concession Agreement;

- (iv) A breach of any express representation or warranty by the Concessionaire which has a Material Adverse Effect and such breach is not remedied within ninety (90) days of receipt of written notice from the NIP specifying such breach and requiring the Concessionaire to remedy the same;
- (v) Any actions or omissions attributable to the Concessionaire, including delay on the part of the Concessionaire to discharge any of its obligations that has a Material Adverse Effect on the Implementation of the Project;
- (vi) Failure of the Concessionaire to achieve Construction Completion of the Plant or any Module within the time period specified in this Concession Agreement or such further extensions as may be granted by NIP;
- (vii) Dissolution of the Concessionaire pursuant to Applicable Law, except for the purpose of a merger, consolidation or reorganization that does not affect the ability of the resulting entity to perform all the obligations of the Concessionaire under this Concession Agreement and provided further that such resulting entity expressly assumes all such obligations;
- (viii) Declaration of insolvency or the appointment of a liquidator in a proceeding for dissolution of the Concessionaire after lawful notification and due hearing, which declaration or appointment has not been set aside within sixty (60) days thereof;
- (ix) Failure of the Lead Member to discharge and fulfil their obligations under this Concession Agreement and/or in connection with the Project;
- (x) Failure of the Lead Member to nominate and appoint the NIP nominee on the board of the Concessionaire;
- (xi) Abandonment of the Project by the Concessionaire;
- (xii) NIP notifies the Concessionaire of a material failure by the Concessionaire or its employees or agents or Contractor(s) to upgrade and manage the Project in accordance with the terms and conditions of this Concession Agreement and further issues a notification to the Concessionaire of the failure to remedy such non-compliance within the time frame as may reasonably have been specified for rectifying the same;
- (xiii) Failure on the part of the Concessionaire to ensure that the net aggregate capacity of the Modules of the Plant to meet the energy requirements of the Primary Power Purchasers at any point in time during the Concession Period;

- (xix) If there is a change in the rights of ownership of the Concessionaire or in the powers of any trustee/member of the governing body to direct the management or the policies of the Concessionaire where such change would be reasonably likely to have a Material Adverse Effect on the ability of the Concessionaire to comply in all material respects with its obligation under this Concession Agreement.
- (b) During the Concessionaire Event of Default the obligations of NIP under this Concession Agreement shall be suspended and NIP shall have no liability hereunder during any of the foregoing Cure Periods while the relevant event remains uncured.

18.3 Step in Rights to Lenders

- (a) The Concessionaire and NIP agree that in case the Concessionaire is in default under the Financing Agreements, the Lenders may approach NIP to replace the Concessionaire with a Substitute Entity for carrying out the construction, operation, maintenance and management of the Plant and implementing the Project. Provided however that NIP may appoint such Substitute Entity only if such recommended Substitute Entity meets all the eligibility criteria specified in the RFP and this Concession Agreement. Furthermore, the Substitute Entity shall undertake to execute a Substitution Agreement with the NIP and the Lenders to discharge all the obligations of the Concessionaire under this Concession Agreement and the Financing Agreements;
- (b) Upon the appointment of the Substitute Entity by NIP, this Concession Agreement shall stand terminated and the Concessionaire shall execute a novation deed in favor of the Substitute Entity to discharge the obligations under this Concession Agreement and the Project Agreements related thereto.
- (c) From the date of such novation, the Substitute Entity shall enjoy the rights of the Concessionaire under this Concession Agreement and the Project Agreements and shall be liable to discharge and perform all liabilities and obligations of the Concessionaire under this Concession Agreement and the Project Agreements.
- (d) The Concessionaire shall hand over the peaceful possession of the Project Site to the NIP and NIP shall hand over the possession of the Project Site to the Substitute Entity.
- (e) NIP shall be entitled to terminate this Concession Agreement if the Substitute Entity commits a Material Breach of its obligations under this Concession Agreement after its appointment as a Substitute Entity.

ARTICLE 19: TERMINATION

19.1 Termination by NIP for Concessionaires Event of Default

In the event the NIP terminates this Concession Agreement for a Concessionaires Event of Default, the Concessionaire will be obligated to transfer and hand over the Plant, the Project Site, buildings, and any other Assets created by the Concessionaire to the NIP in accordance with Article 16. However, in the event of such a termination and transfer to NIP, NIP shall not be obliged to compensate the Concessionaire in any manner and form for the construction and establishment of the Plant on the Project Site under the Project.

19.2 Transfer of the Plant, Project Site and Assets upon Termination

- (a) In the event the Concessionaire Event of Default occurs prior to the completion of the Construction Phase of any single Module and NIP terminates the Concession Agreement, the Concessionaire shall forthwith transfer and hand over the Project Site to NIP in terms of clause 19.1 above;
- (b) In the event the Concessionaire Event of Default occurs after the completion of the Construction Phase of any single Module and NIP terminates this Concession Agreement, the Concessionaire shall forthwith but not later than sixty (60) days from the termination notice transfer and hand over the Plant, Project Site and Assets created by the Concessionaire to the NIP in terms of clause 19.1 above;

19.3 Distribution of Insurance Proceeds upon Termination

Whenever this Concession Agreement is terminated following a Force Majeure event and insurance proceeds are available in connection with the Insurance Policies to which the Concessionaire is entitled or should be entitled pursuant to this Concession Agreement with respect to the Project, such proceeds shall, if not used to effect a restoration or make repairs to the Project, shall be distributed first to clearing any outstanding dues whatsoever of the Concessionaire to the NIP, then to the payment towards indebtedness (actual or contingent) owing to the Lenders and lastly to the Concessionaire.

19.4 Survival of obligations

- (a) Notwithstanding anything to the contrary contained in this Concession Agreement any termination pursuant to the provisions of this Concession Agreement shall be without prejudice to the accrued rights of either Party including its right to claim and recover money damages, insurance proceeds, security deposits, and other rights and remedies, which it may have in law or contract. All obligations of Concessionaire under this Agreement, shall survive the termination to the extent such survival is necessary for giving effect to such obligations.

19.5 Termination by Concessionaire for NIP event of default

- (a) In case of a NIP Event of Default, the Concessionaire may terminate this Concession Agreement, by giving a prior written notice of ninety (90) days to the NIP expressing its intention to terminate this Concession Agreement.
- (b) In case of termination of the Concession Agreement in accordance to sub-clause (a) above, the Concessionaire, shall forthwith transfer and hand over the peaceful possession of the Plant, together with Project Site and Assets created by the Concessionaire to the NIP without any Encumbrances or lien at the value determined in accordance with Article 16 of this Concession Agreement.

ARTICLE 20: LIABILITY AND INDEMNIFICATION

20.1 Liability to Third Parties

- (a) A Party shall promptly inform the other Party of any claims or proceedings or anticipated claims or proceedings against the other Party and in respect of which the other Party is entitled to be indemnified under this Article 20 as soon as a Party becomes aware of the same. Each Party shall give reasonable assistance to the other in defending such claims and the Party giving such assistance shall be entitled to be indemnified to the extent of the costs incurred by it in this regard;
- (b) None of the Parties shall permit any claim or proceedings referred to in sub-clause (a) above to be settled without the prior written consent of the other Party;
- (c) NIP shall not be liable in any manner whatsoever for the obligations and liabilities incurred by the Concessionaire in connection with the running of the Plant or otherwise during the Concession Period and for the Concessionaire's contracts with Third Parties.

20.2 Indemnification

The Concessionaire shall indemnify, defend and hold harmless NIP during and after the term of this Concession Agreement from and against all liabilities, damages, losses, expenses, deaths, demands, actions, proceedings, costs and claims of any nature whatsoever, including without limitation legal fee and expenses, suffered by NIP or any Third Party as a result of or arising out of or in any way connected with the acts, omissions, negligence, nuisance, breach of this Concession Agreement and failure to perform obligations hereunder of or by the Concessionaire and its employees, agents, representatives and Contractors, including the use or violation of any copyright work or literary property or patented invention, article or appliance, except to the extent that such injury, damage or loss is attributable to a negligent or willful act or omission of NIP.

20.3 Risk and Liability

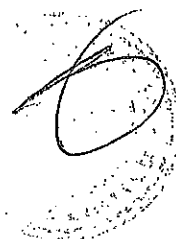
Except as expressly provided in the Concession Agreement, the Concessionaire shall carry out and perform its rights and obligations under the Concession Agreement at its own cost and risk. It shall be fully responsible for and shall bear the financial risks in relation to the Project and all its rights and obligations under or pursuant to the Concession Agreement.

ARTICLE 21: INSURANCE**21.1 Coverage**

- (a) The Concessionaire shall, on and from the date of taking over the possession of the Project Site if any, up to the end of Concession Period, maintain or cause to be maintained, at its own expense, the following insurance policies:
- (i) Fire and Theft;
 - (ii) Loss or damage to the Plant, Project Site and Assets created by the Concessionaire, due to events like earthquake, floods etc.; and
 - (iii) In respect of claims for personal injury to or death of any person employed by the Concessionaire or its Contractor, subcontractors and arising out of such employment.
- (b) The premiums payable on insurance coverage as indicated above, including any costs and expenses incidental to the procurement and enforcement of such insurance coverage shall be borne by the Concessionaire.

21.2 Evidence of Insurance Coverage

The Concessionaire shall furnish to NIP copies of certificates of insurance in respect of the Insurance Policies referred to in clause 21.1 as soon as reasonably practicable after they are received by the Concessionaire and from time to time shall furnish evidence to NIP that all premiums have been paid, and that the relevant policies remain in existence. In the event that the Concessionaire fails to maintain the Insurance Policies as required under this Concessionaire Agreement as certified by the Independent Expert, NIP may take such required policies and recover the costs and expenses incurred in this regard from the Concessionaire.



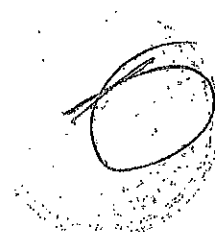
ARTICLE 22: INTELLECTUAL PROPERTY & CONFIDENTIALITY**22.1 Proprietary Material**

- (a) The Concessionaire and the NIP hereby grant to each other an irrevocable, royalty-free, non-exclusive license to use the Proprietary Material, which have been or are hereafter written, originated, made or owned by any of them or any of their respective employees, Contractors, consultants or agents in connection with this Concession Agreement or the design, construction, operation, maintenance, insurance and financing of the Project. All Proprietary Material shall be clearly marked as such in capital letters and in bold face print.
- (b) Such license shall carry the right to use the Proprietary Material for all purposes connected with the Project; however, it shall not be transferable to any Party under this Concession Agreement.

22.2 Confidentiality

No Party shall, without the prior written consent of the other Party, at any time divulge or disclose or suffer or permit its servants or agents to divulge or disclose to any Person or use for any purpose unconnected with the Project any information which is, by its nature or is marked "**Proprietary Material**," concerning the other (including any information concerning the contents of this Concession Agreement) except to their respective officers, directors, employers, agents, representatives and professional advisors or as may be required by any law, rule, regulation or any judicial process for a period of two (2) years after the Transfer Date; provided, however, that a Party, with the written consent of the other Party, may issue press releases containing non-sensitive information in relation to the progress of the Project. This clause 22.2 shall not apply to information:

- (a) Already in the public domain, otherwise than by breach of this Concession Agreement;
- (b) Already in the possession of the receiving Party before it was received from the other Party in connection with this Concession Agreement and which was not obtained under any obligation of confidentiality; and
- (c) Obtained from a Third Party who is free to divulge the same and which was not obtained under any obligation of confidentiality.



ARTICLE 23: DISPUTE RESOLUTION

23.1 Amicable Settlement

In the event that any dispute, controversy or claim arises among the Parties in connection with or under this Concession Agreement or the interpretation of any of its provisions or upon the occurrence of an Event of Default, the NIP and the Concessionaire shall appoint one senior representative each, who is not involved in the day-to-day operations relating to the Project and is readily available in the vicinity of Karachi to serve on a consultation panel and such consultation panel shall meet promptly upon the request of any member thereto or of any Party, in an effort to resolve such dispute, controversy or claim. All such disputes shall be amicably settled through mutual consultation and negotiation between the representatives on the consultation panel. Each Party will bear its own expenses in connection with the appointment of the representatives in terms of this clause provided that the Party against whom the decision is given by the consultation panel will be reimbursed for all such expenses by the Party against whom such decision is made. The Parties hereto agree to use their respective best efforts to resolve all disputes arising hereunder through the consultation panel. The consultation panel shall be situated at Karachi.

23.2 Failure to Amicably Settle

In the event the Parties are unable to resolve any dispute, controversy, or claim in accordance with clause 23.1, such dispute, controversy or claim shall be referred to arbitration, comprising of a three (3) member arbitral tribunal, each Party appointing one arbitrator and both the arbitrators mutually appointing the third arbitrator. The process of arbitration shall be in accordance with the provisions of the Arbitration Act, 1940. The seat of arbitration shall be Karachi. The arbitration proceedings shall be conducted in English.

23.3 Performance during Dispute Resolution

Pending the submission of a dispute, controversy or claim to the consultation panel or to the arbitral tribunal, and thereafter until the final decision of the consultation panel or the arbitral tribunal, as the case may be, the Parties shall continue to perform all of their obligations under this Concession Agreement, without prejudice to a final adjustment in accordance with such decision. Further, this Concession Agreement shall remain subsisting and operative during the consultation or adjudication proceedings and no payment due and payable to either Party shall be withheld except the payment in dispute, if any.

ARTICLE 24: MISCELLANEOUS

24.1 Amendments

Except as otherwise provided herein, no modification, amendment or waiver of any provision of this Concession Agreement shall be effective unless such modification, amendment or waiver is approved in writing by each of the Parties.

24.2 Severance of Terms

Whenever possible, each provision of this Concession Agreement shall be interpreted in such manner as to be effective and valid under Applicable Law, but if any provision of this Concession Agreement is held to be invalid, illegal or unenforceable in any respect under any Applicable Law or rule in any jurisdiction, such invalidity, illegality or unenforceability shall not affect any other provision or any other jurisdiction, but this Concession Agreement shall be reformed, construed and enforced in such jurisdiction as if such invalid, illegal or unenforceable provision had never been contained herein.

24.3 Language

All notices, certificates, correspondence or other communications under or in connection with this Concession Agreement shall be in English.

24.4 Notices

Any notice to be given hereunder shall be in writing and shall either be delivered personally or sent by registered post, telex, facsimile transmission, electronic mail or other means of telecommunication in permanent written form. The addresses and numbers for service of notice shall be given to the Parties at their respective addresses set forth below:

If to NIP:

Name:

Address:

If to the Concessionaire:

Name:

Address:

or such other address, telex number, or facsimile number as may be notified by that Party to any other Party from time to time, and shall be deemed to have been made or delivered (i) in the case of any communication made by letter, when delivered by hand, by recognized international courier or

by mail (registered, return receipt requested) at that address and (ii) in the case of any communication made by telex or facsimile, when transmitted properly addressed to such telex number or facsimile number. In case any Party changes its address, communication numbers, or directed attention as set forth above, it shall notify the other Parties in writing prior to the adoption thereof. All notices sent by one Party to the other under this Contract shall be numbered separately and all general notices will be numbered separately for ease of identification.

24.5 Governing Law

This Concession Agreement shall be governed by and construed in accordance with the Laws of Pakistan and to the extent possible the courts of Karachi shall have jurisdiction over the disputes arising between the Parties.

24.6 Original Document

This Concession Agreement is made in two original copies, each having the same contents and the Parties have read and thoroughly understood the contents hereof and have hereby affixed their respective signatures and seals before witnesses.

24.7 Relationship

Nothing in this Concession Agreement shall constitute or be deemed to constitute a partnership between the Parties or confer on any Party any authority to bind the other or to contract in the name of the other or to incur any liability or obligation on behalf of the other or make or deem to be the agent of the other in any way.

24.8 Survival

The provision relating to liability and indemnification, intellectual property and confidentiality and dispute resolution contained in this Concession Agreement shall survive the termination or expiry of this Concession Agreement.

24.9 Waiver

The failure of any Party to insist upon strict adherence to any term of the Agreement on any occasion shall not be considered a waiver of any right hereunder nor shall it deprive such Party of the right thereafter to insist upon strict adherence to that term or any other of the Agreement.

24.10 Others

Prior to executing this Concession Agreement, the Concessionaire has conducted a due diligence audit to its satisfaction in respect of NIP, contractual structure for implementing the Project, technical and financial feasibility of the Project, the Applicable Laws and Applicable Approvals and



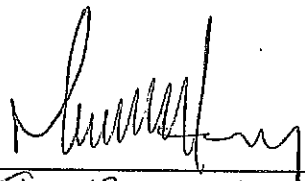
all matters concerning or related to the Project. The Concessionaire is entering into this Concession Agreement on the basis of its own satisfaction based on its due diligence.

IN WITNESS WHEREOF this Concession Agreement has been executed by the duly authorized representatives of the Parties hereto on the day and year first above written.


 National Industrial Parks
 Development and
 Management Company

Name: Mohsin M. Syed

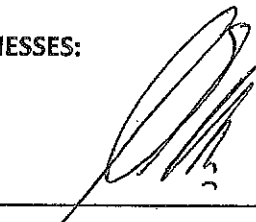
Designation: C.E.O


 Jan 13 2014
 Concessionaire

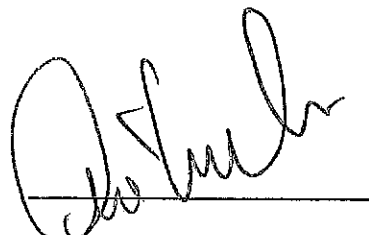
Name: Mahmoud ul Haq

Designation: C.E.O

WITNESSES:


 Name:

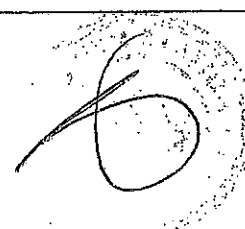
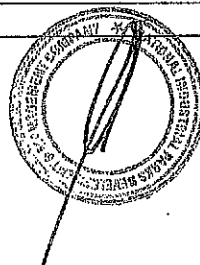
Address:


 Name: Ali Kabeer

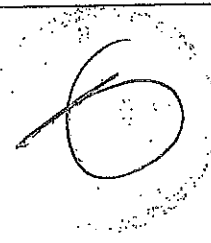
Address: 50/II, 9th Commercial St, PH IV, DHA,
 Karachi

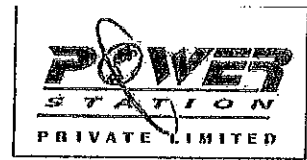
SCHEDULES

Schedule A	Memorandum of Understanding
Schedule B	Form of Bid Security – As per Annexure A
Schedule C	Form for Lease Deed – As per Annexure A
Schedule D	Form for Construction Phase Performance Security – As per Annexure A
Schedule E	Form for Operation Phase Performance Security – As per Annexure A
Schedule F	Form for Power Purchase Agreement with Secondary Power Purchaser(s) – As per Annexure B
Schedule G	Independent Expert – Terms of Reference – As per Annexure C
Schedule H	Minimum Technical Specifications – As per NIP Tender Specifications



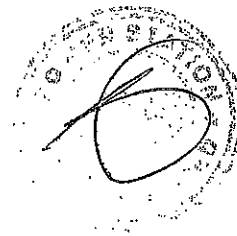
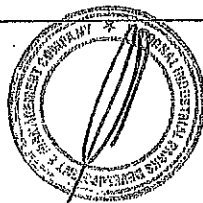
Schedule I	Criteria for Operations and Management Contractor – As per Annexure D
Schedule J	Project Installation Timeline
Schedule K	Fuel Supply Agreement (to be supplied by NIP)





SCHEDULE A - MEMORANDUM OF UNDERSTANDING

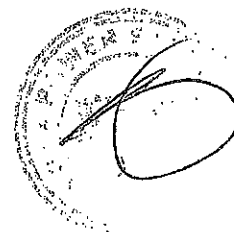
[This Schedule is no longer relevant and has accordingly been deleted]



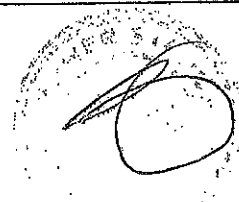


SCHEDULE B - FORM OF BID SECURITY (Bank Guarantee)

[This Schedule is no longer relevant and has accordingly been deleted]



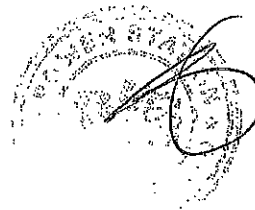
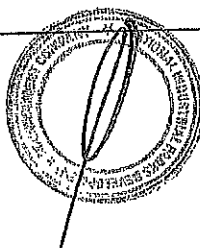
FORM OF BID SECURITY (Bank Guarantee) - [This Schedule is no longer relevant and has accordingly been deleted]





SCHEDULE C - FORM OF LEASE DEED

[To be inserted]



SCHEDULE D - FORM OF CONSTRUCTION PHASE PERFORMANCE SECURITY

Issue Date:

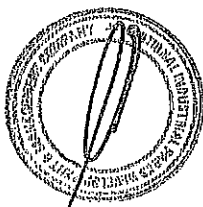
Dear Sirs,

We the ("Guarantor") refer to the Concession Agreement (the "Concession Agreement") for the design, engineering, construction, insuring, commissioning, operation and maintenance of an approximately [48] MW gas-fired electric generation facility (the "Plant") to be located at Korangi Creek Industrial Park, Karachi, Pakistan (the "Project") signed by and between National Industrial Parks Development and Management Company ("NIP") and Power Station Private Limited, a private limited company incorporated under the laws of Pakistan, whose principal office is located at 10 K block 6 PECHS Karachi, Sind, Pakistan (the "Concessionaire").

In this Construction Phase Performance Security, unless otherwise defined herein, capitalized terms shall bear such meaning as ascribed to the said terms in the Concession Agreement:

- (a) "Business Day" means a day (other than Saturday or Sunday) when banks in Karachi, Pakistan are open for business;
- (b) "Insolvency Event" means that the Concessionaire has voluntarily commenced bankruptcy, insolvency, reorganization, stay, moratorium or similar debtor-relief proceedings, or shall become insolvent or is unable to pay its debts as they become due, or admits in writing its inability to pay its debts or makes an assignment for the benefit of its creditors;
- (c) "Secured Amount" means the sum of [USD 31,250.00/- (United States Dollars Thirty One Thousand, Two Hundred and Fifty only). Upon successful completion of the Construction Phase and COD having being achieved, the Construction Phase Performance Security shall be released by NIP to the Concessionaire in the following manner:
 - (i) On ninety percent (90%) Construction Completion as certified by the Independent Expert, thirty percent (30%) of the amount of Construction Phase Performance Security will be released to the Concessionaire;
 - (ii) On hundred percent (100%) Construction Completion as certified by the Independent Expert, forty percent (40%) of the amount of Construction Phase Performance Security will be released to the Concessionaire;
 - (iii) Within a period of thirty (30) days from the Completion and Operations Date and the furnishing of the Operations Phase Performance Security by the Concessionaire, the balance thirty percent (30%) of the amount of Construction Phase Performance Security will be released to the Concessionaire by NIP.

2. The Guarantor's obligation to make payments under this Construction Phase Performance Security shall arise on receipt of a demand stating that in the sole and absolute judgement of NIP:



(a) The Concessionaire has failed to perform or observe any of its duties and/or obligations arising under or in connection with the Concession Agreement and/or has committed a breach of any provision and/or has failed to fulfil any warranty or indemnity set out in the Concession Agreement and/or has failed to satisfy any of its liabilities under or in connection with the Concession Agreement and/or the occurrence of an Insolvency Event and/or an event giving NIP the right to terminate the Concession Agreement has occurred; and

(b) The amount claimed by NIP.

3. Any demand made by NIP shall be conclusive evidence that the sum stated in such demand is due and payable under this Construction Phase Performance Security and the Guarantor shall not be required or permitted to make any other investigation or inquiry.

4. NIP may make one or more demands hereunder. Each demand shall be in the form set out in Annex 1 and shall be delivered on a Business Day and during normal banking hours ending on or before the expiry of thirty (30) days beyond the COD (the "Expiry Date") which shall be deemed to be received on such day. The Guarantor shall pay such demand in full, free of any present or future taxes, levies, duties, charges, fees or withholdings and without any deduction, restriction, conditions, withholding, set-off or counterclaims whatsoever within three (3) Business Days.

5. The maximum aggregate liability of the Guarantor under this Construction Phase Performance Security shall not exceed the Secured Amount.

6. The Guarantor acknowledges and agrees that the liability of the Guarantor under this Construction Phase Performance Security shall not be impaired, reduced, discharged or otherwise affected by reason of any of the following:

(a) Any variation, amendment, alteration or supplement to the Concession Agreement or to the extent, nature or method of performance of the duties and/or obligations referred to in the Concession Agreement; or

(b) Any allowance of time, delay, waiver, forbearance, forgiveness, indulgence, compromise, delay by or on the part of NIP in asserting any of its rights against the Concessionaire or other dealing under or in connection with the Concession Agreement or in respect of any right or remedy arising there under; or

(c) Any settlement or arrangement made between NIP and the Concessionaire in relation to the Concession Agreement; or

(d) Any composition, discharge, release, concession or other variation of liability entered into with, or granted to, the Concessionaire; or

(e) The Concession Agreement or any provision thereof becoming illegal, invalid, voidable or unenforceable; or

- (f) Termination of the Concession Agreement or of the Concessionaire's employment under it; or
- (g) Any disability, incapacity, legal limitation, change in ownership or change in status of the Concessionaire; or
- (h) The occurrence of an Insolvency Event or any event giving NIP the right to terminate the Concession Agreement; or
- (i) A change in the constitution of the Concessionaire; or
- (j) NIP taking, holding, varying, realizing or not enforcing any other security for the liabilities of the Concessionaire under the Concession Agreement; or
- (k) Any other act, omission or default which, in the absence of this provision, would or might have operated to discharge, reduce, exonerate or otherwise affect the liability of the Guarantor under the terms of this Construction Phase Performance Security; or
- (l) In each case whether with or without notice to or the consent of the Guarantor and the Guarantor hereby waives any requirement for notice to it of any such event.

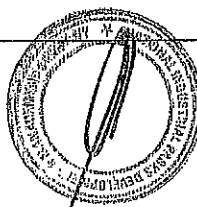
7. No failure by NIP to exercise or delay by NIP in exercising any right or remedy shall operate as a waiver, nor shall any single or partial exercise or waiver of any right or remedy preclude its further exercise or the exercise of any other right or remedy.

8. Each of the provisions of this Construction Phase Performance Security is severable and distinct from the others, and if at any time any such provision is or becomes ineffective, inoperable, invalid or unenforceable it shall be severed and deemed to be deleted from this Construction Phase Performance Security, and in such event the remaining provisions of this Construction Phase Performance Security shall continue to have full force and effect.

The expiry of this Construction Phase Performance Security shall not affect or discharge the liability of the Guarantor to pay any demand received prior to the expiry of the Construction Phase Performance Security. Furthermore, the Guarantor acknowledges that it shall only release the Construction Phase Performance Security upon receiving confirmation from NIP that the Concessionaire has furnished to NIP the Construction Completion Certificate issued by the Independent Expert.

10. All payments to be made under this Construction Phase Performance Security shall be made to the account specified in the relevant demand.

11. The benefit of NIP in and to this Construction Phase Performance Security shall be capable of assignment or transfer to any person, company, Guarantor or financial institution at any time providing finance in connection with the Project.



12. Subject to paragraph 4 above, any notices or communications to be made by the Guarantor or NIP to the other under or in connection with this shall be in writing and made to the other at the following addresses:

The Guarantor:

Address: [●]
To the attention of: [●]

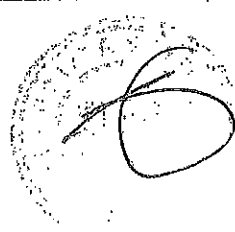
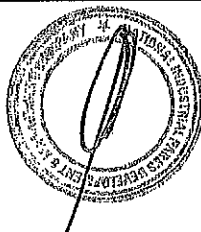
NIP:

Address: [●]
To the attention of: [●]

13. All payments under this Construction Phase Performance Security shall be made free of any withholding or deduction. If the Guarantor is compelled by law to make any deduction or withholding, the Guarantor will gross up the payment so that the net sum received by NIP will be equal to the full amount which NIP would have received had no such deduction or withholding been made.
14. This Construction Phase Performance Security shall be governed by and construed in accordance with the laws of Pakistan and the courts of Karachi shall have exclusive jurisdiction over any dispute arising under or in connection with this Construction Phase Performance Security save that any decision, judgment or award of such court may be enforced in the courts of any jurisdiction.

For and on behalf of the Guarantor
[Insert Name of Guarantor]

Name:
Designation:



ANNEX 1 - Form of Demand

To: *[Insert details of the Guarantor]*

Dear Sirs,

Re: **The Construction Phase Performance Security dated *[insert date]* issued by *[insert details of the Guarantor]* in favor of National Industrial Parks Development and Management Company ("NIP") (the "Construction Phase Performance Security")**

[We] hereby state that in our sole and absolute judgment Power Station Private Limited, a limited company organized and existing under the laws of Pakistan, with its principal office at 10 K Block 6 PECHS Karachi, Sind, Pakistan. (hereinafter referred to as the "**Concessionaire**") has failed to perform or observe any of its duties and/or obligations arising under or in connection with the Concession Agreement and/or has committed breach of any provision and/or has failed to fulfill any warranty or indemnity set out in the Concession Agreement and/or has failed to satisfy any of its liabilities under or in connection with the Concession Agreement and/or an Insolvency Event has occurred and/or an event has occurred giving NIP the right to terminate the Concession Agreement and we herewith demand payment of the amount of PKR [●]/- (Pak Rupees *[insert amount in words]* only) under the Construction Phase Performance Security.

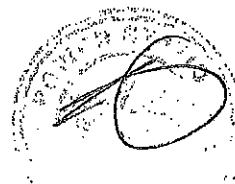
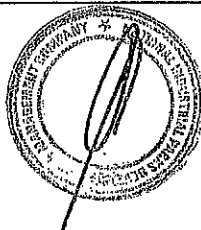
Payment should be made to Account Number [●], kept with [●] at [●].

Yours faithfully

For and on behalf of
National Industrial Parks Development and Management Company

[Signature]
The:

Designation:





SCHEDULE E - FORM OF OPERATION PHASE PERFORMANCE SECURITY

Issue Date:

Dear Sirs,

We the ("Guarantor") refer to the Concession Agreement (the "Concession Agreement") for the design, engineering, construction, insuring, commissioning, operation and maintenance of an approximately [48] MW [residual fuel oil]-fired electric generation facility (the "Plant") to be located at Korangi Creek Industrial Park, Karachi, Pakistan (the "Project") signed by and between National Industrial Parks Development and Management Company ("NIP") and Power Station Private Limited, a private limited company incorporated under the laws of Pakistan, whose principal office is located at 10 K block 6 PECHS, Karachi, Sind, Pakistan (the "Concessionaire").

In this Operation Phase Performance Security, unless otherwise defined herein, capitalized terms shall bear such meaning as ascribed to the said terms in the Concession Agreement:

- (a) "Business Day" means a day (other than Saturday or Sunday) when banks in Karachi, Pakistan are open for business;
- (b) "Insolvency Event" means that the Concessionaire has voluntarily commenced bankruptcy, insolvency, reorganization, stay, moratorium or similar debtor-relief proceedings, or shall become insolvent or is unable to pay its debts as they become due, or admits in writing its inability to pay its debts or makes an assignment for the benefit of its creditors;
- (c) "Secured Amount" means the sum of PKR [●]/- (Pak Rupees [insert

To be filled up by the bidder

Amount in words] only) corresponding to [●] % of the Estimated Project Cost

To be filled up by the bidder

Under the Concession Agreement.

The Operation Phase Performance Security shall be released by NIP to the Concessionaire within [30] days after the expiry of six (6) months from the date of end of the Concession Period. If any amounts due to NIP from the Concessionaire are not paid off until thirty (30) days prior to the date of end of Concession Period, NIP shall have the right to en-cash this Operation Phase Performance Security to the extent of such unpaid amounts and the remaining portion of the Operation Phase Performance Security will be released as stated above.

2. The Guarantor's obligation to make payments under this Operation Phase Performance Security shall arise on receipt of a demand stating that in the sole and absolute judgment of NIP:

- (a) The Concessionaire has failed to perform or observe any of its duties and/or obligations arising under or in connection with the Concession Agreement and/or has committed a breach of any provision and/or has failed to fulfil any warranty or indemnity set out in the



Concession Agreement and/or has failed to satisfy any of its liabilities under or in connection with the Concessionaire and/or the occurrence of an Insolvency Event and/or an even giving NIP the right to terminate the Concession Agreement has occurred; and

(b) The amount claimed by NIP.

3. Any demand made by NIP shall be conclusive evidence that the sum stated in such demand is due and payable under this Operation Phase Performance Security and the Guarantor shall not be required or permitted to make any other investigation or inquiry.
4. NIP may make one or more demands hereunder. Each demand shall be in the form set out in Annex 1 and shall be delivered on a Business Day and during normal banking hours ending on or before the expiry of thirty (30) days beyond the COD (the "Expiry Date") which shall be deemed to be received on such day. The Guarantor shall pay such demand in full, free of any present or future taxes, levies, duties, charges, fees or withholdings and without any deduction, restriction, conditions, withholding, set-off or counterclaims whatsoever within three (3) Business Days.
5. The maximum aggregate liability of the Guarantor under this Operation Phase Performance Security shall not exceed the Secured Amount.
6. The Guarantor acknowledges and agrees that the liability of the Guarantor under this Operation Phase Performance Security shall not be impaired, reduced, discharged or otherwise affected by reason of any of the following:
 - (a) Any variation, amendment, alteration or supplement to the Concession Agreement or to the extent, nature or method of performance of the duties and/or obligations referred to in the Concession Agreement; or
 - (b) Any allowance of time, delay, waiver, forbearance, forgiveness, indulgence, compromise, delay by or on the part of NIP in asserting any of its rights against the Concessionaire or other dealing under or in connection with the Concession Agreement or in respect of any right or remedy arising there under; or
 - (c) Any settlement or arrangement made between NIP and the Concessionaire in relation to the Concession Agreement; or
 - (d) Any composition, discharge, release, concession or other variation of liability entered into with, or granted to, the Concessionaire; or
 - (e) The Concession Agreement or any provision thereof becoming illegal, invalid, voidable or unenforceable; or
 - (f) Termination of the Concession Agreement or of the Concessionaire's employment under it; or

- (g) Any disability, incapacity, legal limitation, change in ownership or change in status of the Concessionaire; or
- (h) The occurrence of an Insolvency Event or any event giving NIP the right to terminate the Concession Agreement; or
- (i) A change in the constitution of the Concessionaire; or
- (j) NIP taking, holding, varying, realizing or not enforcing any other security for the liabilities of the Concessionaire under the Concession Agreement; or
- (k) Any other act, omission or default which, in the absence of this provision, would or might have operated to discharge, reduce, exonerate or otherwise affect the liability of the Guarantor under the terms of this Operation Phase Performance Security; or
- (l) In each case whether with or without notice to or the consent of the Guarantor and the Guarantor hereby waives any requirement for notice to it of any such event.

7. No failure by NIP to exercise or delay by NIP in exercising any right or remedy shall operate as a waiver, nor shall any single or partial exercise or waiver of any right or remedy preclude its further exercise or the exercise of any other right or remedy.
8. Each of the provisions of this Operation Phase Performance Security is severable and distinct from the others, and if at any time any such provision is or becomes ineffective, inoperable, invalid or unenforceable it shall be severed and deemed to be deleted from this Operation Phase Performance Security, and in such event the remaining provisions of this Operation Phase Performance Security shall continue to have full force and effect.
9. The expiry of this Operation Phase Performance Security shall not affect or discharge the liability of the Guarantor to pay any demand received prior to the expiry of the Operation Phase Performance Security. Furthermore, the Guarantor acknowledges that it shall only release the Operation Phase Performance Security upon receiving confirmation from NIP that all amounts due and payable by the Concessionaire have been paid and that this Operation Phase Performance Security may be released.
10. All payments to be made under this Operation Phase Performance Security shall be made to the account specified in the relevant demand.
11. The benefit of NIP in and to this Operation Phase Performance Security shall be capable of assignment or transfer to any person, company, bank or financial institution at any time providing finance in connection with the Project.
12. Subject to paragraph 4 above, any notices or communications to be made by the Guarantor or NIP to the other under or in connection with this shall be in writing and made to the other at the following addresses:

The Guarantor:

Address: [●]

To the attention of: [●]

NIP:

Address: [●]

To the attention of: [●]

13. All payments under this Operation Phase Performance Security shall be made free of any withholding or deduction. If the Guarantor is compelled by law to make any deduction or withholding, the Guarantor will gross up the payment so that the net sum received by NIP will be equal to the full amount which NIP would have received had no such deduction or withholding been made.
14. This Operation Phase Performance Security shall be governed by and construed in accordance with the laws of Pakistan and the courts of Karachi shall have exclusive jurisdiction over any dispute arising under or in connection with this Operation Phase Performance Security save that any decision, judgment or award of such court may be enforced in the courts of any jurisdiction.

For and on behalf of the Guarantor
[Insert Name of Guarantor]

Name:

Designation:



ANNEX 1 - Form of Demand

To: [insert details of the Guarantor]

Dear Sirs,

Re: The Operation Phase Performance Security dated [insert date] issued by [insert details of Guarantor] in favor of National Industrial Parks Development and Management Company ("NIP") (the "Operation Phase Performance Security")

[We] hereby state that in our sole and absolute judgment [the Concessionaire], a limited company organized and existing under the laws of Pakistan, with its principal office at [●] (hereinafter referred to as the "Concessionaire") has failed to perform or

To be filled up when required

observe any of its duties and/or obligations arising under or in connection with the Concession Agreement and/or has committed a breach of any provision and/or has failed to fulfil any warranty or indemnity set out in the Concession Agreement and/or has failed to satisfy any of its liabilities under or in connection with the Concession Agreement and/or an Insolvency Event has occurred and/or an event has occurred giving NIP the right to terminate the Concession Agreement and we herewith demand payment of the amount of PKR [●]- (Pak Rupees [insert amount in words])

To be filled up when required

only) under the Operation Phase Performance Security.

Payment should be made to Account Number [●], kept with [●] at [●].

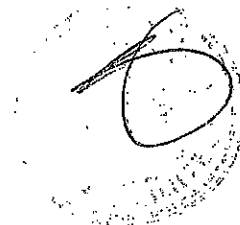
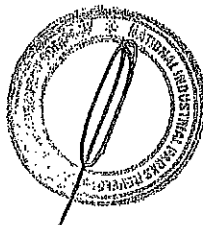
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Yours faithfully

For and on behalf of
National Industrial Parks Development and Management Company

Name:

Designation:

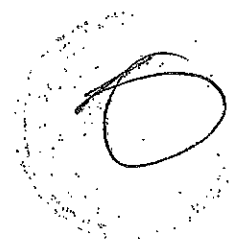
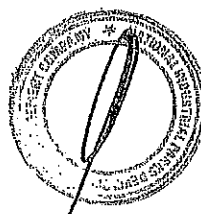


SCHEDULE F - FORM OF POWER PURCHASE AGREEMENT

As per Annexure 2

General Agreement:

1. The concessionaire will be responsible for operation and maintenance of the plant and supplying power to NIP.
 2. Supply of all the required fuel will be the responsibility of NIP
 3. The concessionaire will submit their monthly bill by the 25th of the month, including the cost of the fuel, the bill will be verified by NIP y 30th of the month and the payment certificate released to the concessionaire by 3rd of the next month. While releasing payment, NIP will deduct the fuel cost of that month.
- will establish a confirmed and irrevocable standing letter of credit in favor of the concessionaire valued at an average billing of 3 months of the energy supplied/billed. Concessionaire will draw against the standing letter of credit.

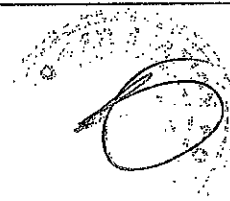




SCHEDULE G - INDEPENDENT EXPERT – TERMS OF REFERENCE

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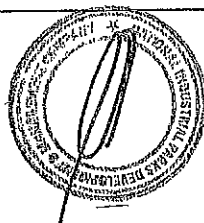
As mutually agreed within 2 weeks of signing the agreement.

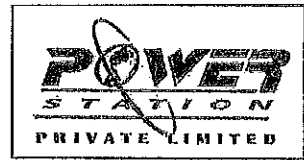




SCHEDULE H - MINIMUM TECHNICAL SPECIFICATIONS

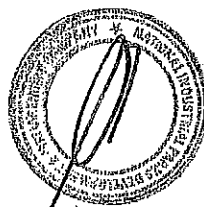
As per NIP Bid Specifications documents





SCHEDULE I - CRITERIA FOR OPERATIONS AND MANAGEMENT CONTRACTOR

[To be inserted]



ANNEXURE-B - SCHEDULE F

Schedule F

**Formulae for the revised power generation facility on
different fuel types.**

RELATING TO 48 MW (NET) POWER GENERATION COMPLEX

DRAFT COPY

April 20

0, 2013

First Draft

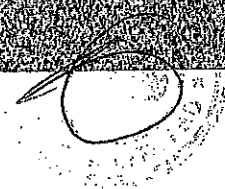
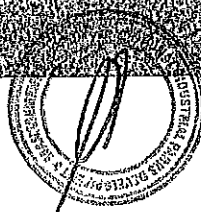
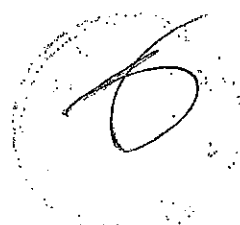
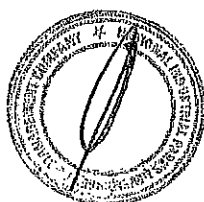


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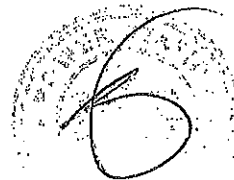


National Industrial Park Development Company, the Purchaser, a public limited company incorporated under the laws of Pakistan with its principal office at Karachi, Pakistan; and

PowerStation Private Limited, the "Concessionaire". A private limited company Incorporated under the Laws of Pakistan with its registered office at 10-K Block 6 PECHS, Karachi, Sind, Pakistan. Each of the Power Purchaser and the Company is hereinafter referred to as a "Party" and collectively, as the "Parties".

RECITALS

- A. WHEREAS the Concessionaire has represented to the NIP that the Concessionaire will build, own and operate, with fresh investment a Generation Facility (as hereinafter defined) to be run on Tri Fuel (as hereinafter defined) to meet NIP's power requirements.
- B. NOW, THEREFORE, in view of the foregoing, promises and in consideration of the mutual benefits to be derived and the representations and warranties, covenants and Agreements contained herein, and other good and valuable consideration the sufficiency of which is hereby acknowledged, and Intending to be legally bound, the Parties hereby agree as follows:



ARTICLE I: DEFINITIONS; RULES OF INTERPRETATION

Section 1.1 Definitions

Whenever the following capitalized terms appear in this Agreement, they shall have the meanings stated below:

"Available Capacity" – The power declared by the Concessionaire in advanced which shall be available in any day for dispatch to the NIP up to the maximum of the Contract Capacity.

"Average Availability" – The sum of Monthly power generation available for the NIP during a period specified in this Agreement divided by the number of Months in such period.

"Back-Up Metering Systems" – All meters and metering devices (including any remote terminal units and an electronic data recording system installed by the Concessionaire and thereafter owned and maintained by the Concessionaire as back-up to the Metering System.

"Billing Cycle" – The period starting from 24.00 hours of the Twenty fifth day of each Month up to 24.00 hours of each next Month.

"Business Day" Any Day that banks in Karachi; Pakistan are legally permitted to open for business.

"Commercial Operating Date" or "COD" – The Day immediately following the date on which the Generation Facility is commissioned and ready for commercial operation, This date shall not be later than August 31st 2014 or 500 Days after signing of this Agreement, Whichever is earlier.

"Concessionaire" –Power Station Pvt Ltd, a private limited company incorporated under the laws of Pakistan. With its registered office at 10-K Block 6 PECHS, Karachi Sind, Pakistan and its permitted successors and permitted assigns and any permitted transferees.

"Contract Capacity" – An amount of net generation capacity of 7 MW (NET) which the Concessionaire commits to provide to the NIP under this Agreement and any subsequent increase therein, in blocks or units, subject to the condition that the overhaul net generation capacity of the Concessionaire shall not exceed a total of 7MW.

"Day" – A period of twenty four (24) hours, commencing at 12:00 midnight of each day and "Daily" shall be construed accordingly.

"Dispatch" – The exercise by the NIP (or its designee, subject to the Laws of Pakistan) of its right to commence, increase, decrease or cease the net electrical energy generated by the Concessionaire by issuing instructions in accordance with this Agreement.

"Dispatched Net Electrical Output" – The required net electrical energy to be generating by the Generation Facility during the relevant period as stated in a Dispatch Instruction or revised Dispatch Instruction, as the

case may be, including Net Electrical Output delivered start-up and shut-down periods and ramp-up and ramp-down periods.

"Dispute" – Any dispute or disagreement or difference arising under, out of, in connection with or relating to this Agreement, including any dispute or difference concerning the existence, legality, validity or enforceability of this Agreement or any provision hereof, or the obligations or performance of a Party under any provision hereof.

"Distribution Company" – The power purchasing company will act as the distribution company.

"Due Date" – The fifteenth Day following the Day the invoice is received by the NIP; provided that, if such date is not a Business Day, the Due Date shall be the next following Business Day

"Financial Cost Component" – As per the agreed tariff rate; the Financial Cost tariff component payable at the rate of Rs. 2.302 per kWh for the Net Electrical Output, including, but not limited to, O&M cost, tax on income of the Concessionaire, insurance cost, return on investment, duties, etc. This component will remain at par with the Fixed Cost Component allowable to other pre-existing generation facilities already supplying power to Distribution Companies through bilateral contracts basis, provided, however the NIP shall index the Fixed Cost Component after every two Calendar Years starting from the COD as per Section 5.1(a).

"Capacity Purchase Price" – The tariff component payable at the rate of Rs. 2.914 Rs/kWh for the availability of the generation capacity which is inclusive of but not limited to salaries, administrative cost, insurance, fixed cost, return on equity, loan repayment, interest. The power purchases shall index the fixed cost component after every two calendar year starting from the COD as per section 5.1(a)

"Gas" – means pipeline quantity natural Gas.

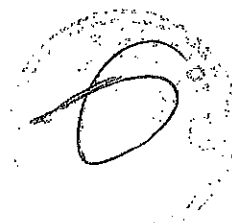
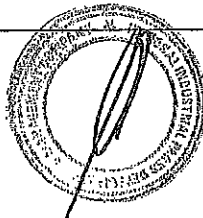
"Fuel Cost Component Amount" – The amount determined on the basis of the Fuel Cost Component Rate and payable for Dispatched Net Electrical Output delivered by the Concessionaire during the Month or part of the Month.

"Fuel Cost Component Rate" – The rate of Rs. 4.16 applied at the Reference Fuel Prices and adjusted for any variation in Fuel Prices from time to time.

"Fuel Price" – The Price of the Fuel delivered at the Generation Facility, excluding General Sales Tax applicable for the Billing Cycle as notified by OGRA.

"General Sales Tax" – The general sales tax leveled under the Sales Tax Act 1990, as may be amended or superseded from time to time. This will not be applicable to the Concessionaire and NIPs will be addressing the GST.

"Generation Facility" – The electric power generation facility formally located at Korangi Creek Industrial Park, Karachi, Sind, Pakistan. Having a generation capacity of approximately 7 MW (net, at reference conditions) to be established; owned, commissioned, operated and maintained by the Concessionaire during the term, including all equipment or facilities together with (i) voltage recorder and (ii) frequency recorder necessary for delivery and sale of electric power to NIP at the interconnection Point.



"Generation Capacity" – The plant is designed for 48 MW. However, it shall have an initial generation capacity of approximately 5 mW by mid August 2014. When the gas turbine is working on simple cycle. This capacity will be increased to approximately 7 mW when combined cycle facilities will be completed by mid August 2015

"Generation License" – The License would be required as issued by NEPRA permitting the generation and supply of electricity by the Concessionaire from the Generation Facility in accordance with the terms and conditions of such license and any additional or modified issued by NEPRA permitting increase by the Concessionaire in net generation capacity of the Concessionaire, in blocks or units, subject to the maximum of 48 MW.

"Inflation Factor" – The Inflation Factor as mentioned in Section 5.1 (as) as determined from time to time.

"KIBOR" – The average "ask side" Karachi Inter Bank Offer for Rupee deposits for a period equal to three (3) Months which appears on the appropriate page of the Reuters service at or about 11:30 a.m. in Karachi on the last available business Day, or in the event that the Reuter's service, or any successor there to, no longer provides such information, such other service as agreed to by the Parties that provides the average "ask side" Karachi Inter-Bank offer Rate for Rupee deposits in the Karachi Interbank market.

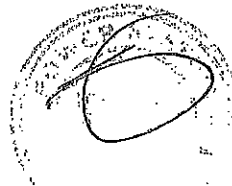
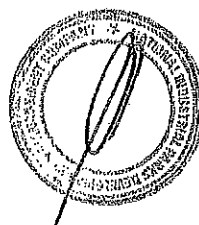
"Metering Systems" – All meters and metering devices (including any remote terminal units and an electronic data recording system) to be procured by the purchaser and thereafter installed at the interconnection Point (s) and tested by the Concessionaire and transferred to the Power Purchase, and thereafter owned and maintained by the NIP and used to measure the Net Electrical Output from the Generation Facility.

"Month" – A calendar Month according to the Gregorian calendar beginning at 12:00 midnight on the last day of the preceding Month and ending at 12:00 midnight on the last day of that Month, and "Monthly" shall be construed accordingly.

"NEPRA" – The National Electric Power Regulatory Authority established by the Regulation generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), and any successor or substitute regulatory agency with authority and jurisdiction over the electricity sector in Pakistan.

"Net Electrical Output" – The net electrical energy expressed to kWh at a voltage level of 11kV and at 50Hz frequency with a tolerance of a $\pm 10\%$ in nominal voltage and $\pm 3\%$ in nominal frequency (Tolerance Limits) that is delivered to the Interconnection Point, as measured by the Metering System or the Back-up Metering System, as the case may be.

"Non Gas Committed Months" – December, January and February, when the Gas is not committed by the Gas supplier to operate the Generation Facility. However, Alternate Fuel (LPG or Diesel) may be made available on "as and when" basis to operate the Generation Facility at Contract Capacity or partially.



"OGRA" – The Oil and Gas Regulatory Authority established under the Oil and Gas Regulatory Authority Ordinance, 2002 (XVII of 2002).

NIP "Reference Date" – The Commercial Operative Date

"Reference Fuel Price" – The Fuel Price, excluding General Sales Tax, presently being

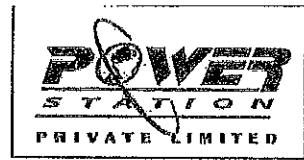
Fuel	Price	Unit
Natural Gas	15.71	Rs/m3
LPG	85	Rs/Kg
Diesel	115	Rs/Lit

"Rupee or "Rs" – The lawful currency of Pakistan

"Standby Letter of Credit or "SBLC" – shall mean a revolving standby letter of credit established by the NIP, from a bank and in terms acceptable to the parties' equivalent to the amount payable by the NIP to the Concessionaire in three consecutive Billing Cycles, including the amount payable towards the Fixed Cost Component, the Financial Cost Component and the O&M Cost Component Amount. For avoidance of doubt, the effect of the term 'revolving' as used in the previous sentence shall be that full amount of the SBLC then applicable shall automatically become available again as soon as the SBLC is drawn upon and the SBLC will be discountable in nature. The "SLBC" shall be renewed after every eleven months for the next period such that there is a valid SBLC throughout the Term of the Agreement or earlier if agreed by the parties, to reflect any change in the generating capacity. The cost of opening the "SLBC" its commission charges and other allied expenditures will be borne by the purchaser. The SBLC shall be established 7 days prior to COD and shall have effective date of 60 days after COD. The draft of SLBC is enclosed as Annexure C.

Section 1.2 Abbreviation

COD	Commercial Operative Date
FCC	Fixed Cost Component
Fin.CC	Financial Cost Component
KIBOR	Karachi Inter-Bank Offer Rates
kV	Kilo Volt
MW	Mega Watt



NEPRA	National Electric Power Regulatory Authority
O&M	Operation and maintenance
OGRA	Oil and Gas Regulatory Authority
Rs.	Pakistani Rupees



ARTICLE III: SALE AND PURCHASE OF ENERGY AND CAPACITY

Section 3.1 Sale and Purchase of Energy and Capacity

Subject to the terms of this Agreement, from and after the Commercial Operative Date

- (a) The Concessionaire shall:
 - (i) Declare to the Power Purchaser the Available Capacity and any change thereof, on daily basis.
 - (ii) Make available to the Power Purchaser the Available Capacity up to the maximum of the Contract Capacity and
 - (iii) Deliver and sell to the NIP at the interconnection point the Dispatched Net Electrical Output.
- (b) Subject to fulfillment of its obligations by the Concessionaire under this Agreement the NIP shall issue dispatch instructions to the Concessionaire for delivery and selling the Available Capacity to the NIP.

Section 3.2 Scheduled Outage Periods

The Concessionaire shall undertake scheduled outages as per outage schedule. This shall be proposed by the Concessionaire and accepted by the NIP.

Section 3.3 Adequate Fuel Supply and Inventory Fuel supply Agreement

On or before the Commercial Operative Date, the purchaser shall provide reasonable evidence to the Concessionaire that the purchaser has, or has procured from a reliable supplier through commercially reasonable Fuel Supply agreements, supplies of Natural Gas, LPG and Diesel during the Term as is contemplated in this Agreement. For avoidance of doubt, it is clarified that the procurement of supply of Natural Gas, LPG and Diesel shall be the sole responsibility of the purchaser, with the Concessionaire's active participation for sourcing of LPG and Diesel.

Section 3.4 Tempering with the Metering System

The Concessionaire shall not tamper, and shall ensure that its employees, contractors or subcontractors of any tier do not tamper, with the Metering System, should the Concessionaire breach the foregoing covenant, the Concessionaire shall (a) take all remediable action reasonably acceptable to the NIP to ensure that such tampering does not reoccur, including the development or addition of security systems, and (b) compensate the NIP for two (2) times the amount or reasonably estimated amount of any overpayment by the NIP resulting from such tampering, which for purposes of such determination shall be assumed to have occurred immediately after the last known accurate test of the Metering System.

ARTICLE IV: METERING AND TESTING

Section 4.1 Metering Systems

- (a) The Parties acknowledge that for the purpose of determining Net Electrical of the Generation Facility, the Metering System and Back-up Metering System are required prior to the delivery of any Net Electrical Output to the Interconnection Point for sale hereunder.
- (b) The Concessionaire shall, with the approval of the NIP procure the Metering System at the cost and expense of the NIP and the Back-up Metering System at the Concessionaire's own cost and expense.
- (c) Immediately after the COD the Power Producer shall invoice the NIP for the cost of procuring the Metering System. The NIP shall pay the Invoice on Due Date.

Section 4.2 Installation of Testing Metering System

The Concessionaire shall, calculate the cost and expense of the NIP, Install the Metering System and at its cost and expense install the back-up Metering System prior to delivery of any Net Electrical Output to the Interconnection Point and shall further test and commission, calibrate or recalibrate the Metering System and the Back-up Metering System at the Interconnection Point.

After every phase wise installation and capacity enhancement increment, there will be a 18 hour testing period that will ensure the commissioning and operation prior to hand over.

Section 4.3 Testing of Metering System after Commercial Operative Date (COD)

- (a) After COD, the NIP shall test the accuracy of the Metering System at any time that the reading of electrical energy from the Metering System and the Back-up Metering System differs by an amount of one half one percent (0.5%). In such an event the NIP shall test the accuracy of Metering System and recalibrate the Metering System. The NIP shall give the Concessionaire not less than 48 hour notice for such test and Concessionaire shall have the right to witness such tests provided that if the Concessionaire representatives fail to attend such tests, such right shall have been waived with respect to such test. The Metering System will be tested and recalibrated biannually
- (b) After COD, the Concessionaire shall test the accuracy of the relevant Back-up Metering System biannually. The Concessionaire shall give the NIP not less than 48 hours for such tests and the NIP shall have the right to witness such tests, provided that if the NIP representatives fail to attend such tests, such right shall have been waived with respect to such test, The Metering System will be tested and recalibrated biannually.

Section 4.4 Metering Reading

The readings of the Metering System and the Back-Up Metering System shall be read on the COD and thereafter on a Monthly basis according to the Billing Cycle by a committee comprising authorized representatives of the Concessionaire and the purchaser.

Section 4.5 Sealing of Metering System

The Metering System and Back-Up Metering System shall be jointly sealed by the Parties. Seals of the Metering System will be only broken by the NIP's personnel. The NIP shall give the Concessionaire at least 48 hours advance notice of the breaking of the seals or any part of the Metering System. Seals on the Back-Up Metering System shall be broken by the Concessionaire's personnel. The Concessionaire shall give the NIP at least 48 hours advance notice of the breaking of seals. Such notices shall specify the time at which the meter seals shall be broken.

ARTICLE V: COMPENSATION, PAYMENT AND BILLING

Section 5.1 Payments to Concessionaire

(a) Fixed Cost Component (FCC)

After the COD, the NIP shall pay the Concessionaire the Fixed Cost Component, as adjusted from time to time; on Monthly basis in appear for the energy delivered by the Concessionaire at the Interconnection Point.

Inflation Factor

After the Commercial Operation Date on each anniversary at 6 month period of COD, Fixed Cost Component shall be indexed on account of Inflation Factor for the period "p" as per formula given below. The source indexes for the calculation of the impact of Pakistan. Inflation shall be the Whole Sale Price Index for manufacturing ("WPI") as notified by the Federal Bureau of Statistics of the GOP and as available on its website. The value of the WPI at the Reference Date shall be deemed to be the value for the Month in which COD is achieved and as rebased and agreed by the Parties, if required, as a result of re-basing by the Federal Bureau of Statistics of the GOP.

In case of abnormal rise of Inflation costs, the concessionaire can request immediate revision.

The Fixed Costs Component shall be indexed as follows:

$$FCC(p) = FCC(Ref) - \text{Inflation Factor}$$

Where:

FCC (p) = the value of the Fixed Cost Component of the Tariff per kWh, expressed in Rupees, as adjusted at the relevant calculation date, p.

FCC (Ref) = the value of the Fixed Cost Component of the Reference Tariff per kWh, expressed in Rupees, at the Reference Date.

Where

$$\text{Inflation Factor} = (WPI/WPI(Ref))$$

WPI = the average value of the end of Month values for the WPI over the available twelve months immediately prior to the date of calculation and

WPI (Ref) = the value of the whole sale price index for manufacturing on the Reference Date.

(b) Financial Cost Component (Fin CC)

After the COD, the NIP shall pay the Concessionaire the Financial Cost Component on Monthly basis in arrear for the energy delivered by the Concessionaire at the Interconnection Point subject to adjustment as provided hereinafter, based on 48 MW.b

(i)	Reference Capital Investment	=	US\$ 1,295 per KW
(ii)	Financing tenure	=	Ten (10) years from COD
(iii)	Bank Loan	=	80%
(iv)	Capital investment	=	20%
(v)	Plant availability	=	95%
(vi)	Reference interest rate	=	Quarterly KIBOR + 3% Spread
(vii)	Reference ROI Rate	=	Quarterly KIBOR + 5% Spread
(viii)	Reference exchange rate	=	1 US\$ = Rs. 100.00 1 JPY = Rs.1.05

(c) FinCC for Increased Capacity

There shall be paid to the Concessionaire by the NIP the Financial Cost Component for any subsequent increase in the Contract Capacity made by the Concessionaire subject to the adjustments provided in clause (b) of this section, including the Financing tenure which shall change on account of Commercial operation date of the subsequent increase in the Contract Capacity.

Section 5.2 One Time Adjustment of Fin CC at COD

- (a) The Financial Cost Component will be adjusted at COD as per revised capital Investment of the existing US\$ 1,280 per kW (net) as per the following formula: =

$$\text{Fin CC (rev)} = \text{Fin CC (ref)} \times \frac{\text{Actual capital Investment (US\$)}}{\text{Reference capital investment US\$}} \times \frac{\text{Average Exchange Rate}}{\text{Reference Exchange Rate}}$$

Whereas:

Fin CC ref	=	Rs. 2.3 per kWh Net Electrical Output
Fin CC rev	=	The Financial Cost Component at time of COD

Actual Capital Investment

The actual cost of the capital Investment of the project in US\$ project cost subject to a maximum of US\$ 1,295 per kW (net)

Ref capital investment = US \$1,295 per kW (net)

Weighted average exchange rate

The average exchange rate applicable on various draw from the letter of credit established for Import of equipment.

Reference exchange rate = 01.00 US \$ = Rs. 100.00

Reference exchange rate = 01.00 JPY = Rs. 1.05

The Concessionaire shall provide certified copies of the details of the revised capital investment, one Month prior to the expected COD.

Section 5.3 Quarterly Indexation of Interest Charges

The Interest Adjustment Factor of the Fin CC will be adjusted due to variation in the interest rate as a result of variation in quarterly KIBOR according to the following formula

$$\text{IAF} = 1 (\text{KIBOR1} + 3\%) (\text{KIBOR ref} + 3\%)$$

Where:

IAF	=	Interest Adjustment Factor for each quarter
I	=	Interest for the relevant period
KIBOR ₁	=	The KIBOR on the Day to the Commercial Operation Date and thereafter the last day of the previous Quarter (31 st March, 30 th June, 20 th September or 31 st December, as applicable)
KIBOR _{ref}	=	Reference KIBOR rate is at the time of acquiring financial loan
	=	Time on which such calculation was made

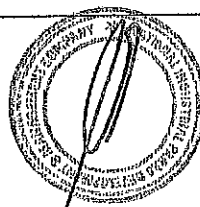
Section 5.4 Fuel Cost Component Amount

- (a) After the COD, NIP shall pay the respective fuel suppliers (Natural Gas, LPG, Diesel) the Fuel Cost Component Amount on Monthly advance or arrears basis as agreed with NIP's fuel supplier for the energy delivered by the Concessionaire at the Interconnection Point, subject to adjustment as provided hereinafter.
- (b) Fuel Cost component will be pass through item, the purchaser will be directly paying the fuel suppliers (Natural Gas, LPG, Diesel) on a monthly basis in arrear or in advance basis as agreed for the fuel consumed for the energy delivered by the Concessionaire at the Interconnection point.
- (c) The Fuel Cost Component Amount will be adjusted for the Billing Cycle according to the following formula:

$$GCCA (rev) = GP (ref) / GP (ref) * GCCR (ref)$$

Where

GCCA(rev)	=	Revised Fuel Cost Component Amount applicable for the Billing Cycle
GP(rev)	=	Revised Fuel Price, excluding General Sales Tax applicable for the Billing Cycle as notified by OGRA for new captive power producers
GP(ref)	=	Reference Fuel Price i.e. 15.72 Rs/m3




GCCR(ref) = Rs. 4.16 per kWh – For Natural Gas

The General Sales Tax on sale of electricity (sale price of electricity, being the sum of Gas Cost Component, Fixed Cost Component and Financial Cost Component). If applicable, shall be billed by the Concessionaire to the NIP on actual incurred basis.

Fuel Cost purchase amount – Reference Only

Fuel	GCCR	Unit
Natural Gas	4.16	Rs/kWh
LPG	21.59	Rs/kWh
Diesel	30.1	Rs/kWh

Section 5.5 Payment during Non-Gas Committed Months

During the Non-Gas Committed Months when the Gas would not be available, the NIP will transfer generation capacity on alternate fuels as listed above. NIP is responsible to procure and pay the Financial Cost Component and the Operation and Maintenance Component to the Concessionaire and the Fuel Cost component to the , adjusted from time to time, as provided hereinabove on Monthly basis in advance or arrear based-upon the Average Availability for the last nine (9) months preceding the commencement of the Non-Gas Committed Months.

Section 5.6 Payment during NIP Non-Dispatch Period

In case the Generation Facility produces electric energy for Dispatch but the NIP opt not to utilize such electric energy or the system parameters are beyond the agreed Tolerance Limits then the Concessionaire will be entitled for the following payments based-upon Historical Average Availability for the last nine (9) Months, excluding Non-Gas Committed Months however, if this scenario arises during the initial nine (9) Months of COD then the Average Availability will be calculated on the basis of the Contract Capacity and is as follows:-

- (i) FCC @ Rs. 0.87/kWh
- (ii) Fin CC @ Rs. 2.30/kWh (reference)

Section 5.7 Payment When No Dispatch by the Concessionaire

For avoidance of doubt, it is clarified that the NIP will not make any payments to the Concessionaire against the following the tariff components, in case the Concessionaire fails to deliver any Net Electrical Output at the Interconnection Point

- (i) Gas Cost Component Amount
- (ii) Fixed Cost Component
- (iii) The Financial Cost Component

Section 5.8 No Payment When Concessionaire Fails to Achieve COD

The NIP will not make any payment whatsoever, to the Concessionaire against the following tariff components till such times, the Concessionaire achieves COD:

- (i) Fuel Cost Component Amount
- (ii) FCC @ Rs. 0.87/kWh
- (iii) Fin CC @ Rs. 2.30/kWh (reference)

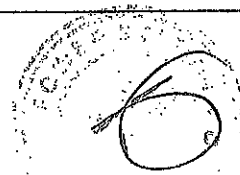
However, if the Concessionaire fails to achieve Commercial Operation Date for an extended period of 180 Days over and above COD period of 500 Days, then the Concessionaire will be responsible to reimburse all the Interconnection charges incurred by the NIP, provided however. The NIP will provide audited account with Invoice for reimbursement of Interconnection charges.

Section 5.9 Payment when NIP Fails to Arrange Power Evacuation at COD

The Concessionaire will be entitled for (a) FCC Rs. 0.87/kWh (b) Fin CC @ Rs. 2.30/kWh (reference) at COD, calculated on the basis of Contract Capacity, provided the generation Facility is ready but NIP is not able to evacuate power due to non-completion of Interconnection Facilities, provided however, the Concessionaire shall provide a certificate from an independent engineer certifying the readiness of Generation Facility for commissioning.

Section 5.10 Illustration of Payment Methodology

For the purpose of simplicity and illustration of payments mentioned at Section 5.5, 5.6, 5.7, 5.8 and 5.9 please see Annexure-B

Section 5.11 Invoicing and Payment

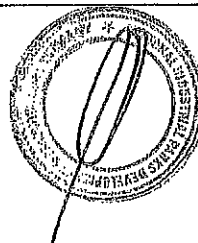


After the COD the Concessionaire will submit an invoice to the bank for the payment against the standing letter of credit (1) original invoice with three (3) copies to NIP along with the OGRA Notification of the Fuel Price of the billing Month and meter reading on or before 5th Day of each Month.

The NIP's bank will make payment through the SBLC, against each invoice submitted by the Concessionaire within 3 working days from the date of submission of the invoice by the Concessionaire.

If the NIP's bank fails to make the payment by Due Date then the NIP will pay to the Concessionaire late payment surcharge at the rate of 1% per Month on the unpaid balance which shall be calculated on daily basis.

The full amount of a SBLC applicable for the time being shall automatically become available again as soon as a SBLC is drawn upon.



ARTICLE V - POWER STATION PRIVATE LIMITED

PROPOSAL FOR 48 MW POWER PLANTS

Loan Amortization Schedule

I	48 MW	Capacity Cost (M. US\$)	6,917		
Loan (M. Rs)	5,534	1 US\$	100		
Interest Rate per Annum	11%	Loan (US\$/kw)	1036		
Interest Repayment Period	10	Annual Interest (%)	11%		
Monthly Installment Rs. Mill	939	(KIBOR+3%)			
	ANNUAL REPAYMENT SCHEDULE				
Year	A	B	C	D=B-C	E=A-D
	Beginning Balance	Yearly Installment	Interest	Repayment of Principal	Ending Balance
1	5,534,192,352	939,713,759	608,761,159	330,952,600	5,203,239,752
2	5,203,239,752	939,713,759	572,356,373	367,357,386	4,835,882,366
3	4,835,882,366	939,713,759	531,947,060	407,766,699	4,428,115,667
4	4,428,115,667	939,713,759	487,092,723	452,621,036	3,975,494,631
5	3,975,494,631	939,713,759	437,304,409	502,409,350	3,473,085,281
6	3,473,085,281	939,713,759	382,039,381	557,674,378	2,915,410,903
7	2,915,410,903	939,713,759	320,695,199	619,018,560	2,296,392,343
8	2,296,392,343	939,713,759	252,603,158	687,110,601	1,609,281,742
9	1,609,281,742	939,713,759	177,020,992	762,692,767	846,588,975
10	846,588,975	939,713,759	93,124,787	846,588,972	3

Annual Energy for Sale (MkWh)	408,279.6
Capacity (MW)	48
Availability (%)	95

Cost of Energy

(Rs/kWh)

$F=D/\text{Annual Energy}$	$G=C/\text{Annual Energy}$	$H=F+G$
Repayment of Principal	Interest	Total Rs./kWh
0.81	1.49	2.3
0.9	1.4	2.3
1.0	1.3	2.3
1.11	1.19	2.3
1.23	1.07	2.3
1.37	0.94	2.3
1.52	0.79	2.3
1.68	0.62	2.3
1.87	0.43	2.3
2.07	0.23	2.3

ILLUSTRATION OF PAYMENT METHODOLOGY

ARTICLE VI

Scenario	Fuel Cost Component at Reference Gas Price of Rs. 15.72	Variable O&M	Fixed Cost Component (Rs./kWh)	Financial Cost Component reference (Rs./kWh)	Total Cost (Rs./kWh)
Gas Committed Months	4.159	0.8153	0.866	2.302	8.142
No Dispatch	0.00	0.00	0.866	2.302	3.168
Non Gas Committed Months - LPG	21.6	0.8153	0.866	2.302	25.573
Non Gas Committed Months - Diesel	30.1	0.8153	0.866	2.302	34.1

ARTICLE VII - Draft of Standby Letter of Credit

Dear Sirs,

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: (NUMBER)

We {issuing Bank}, {City}, Pakistan, at the request of the National Industrial Park Development Company Limited, a public limited company incorporated under the laws of Pakistan, with its principal office at {ADDRESS}, Karachi, Pakistan (the "Applicant") hereby establish our irrevocable and discountable standby letter of credit

No. _____ Dated _____ ("Standby LC") in favor of Power Station Private Limited, a private limited company incorporated under the laws of Pakistan, having its registered at 10-K, Block 6, CHS, Karachi, Sind, Pakistan (the "Beneficiary") for an amount of { _____ }

_____ Only) being the amount that shall be payable by the Applicant to the Beneficiary in 3 Billing Cycles (as defined in the Agreement) in pursuance of the Applicant's obligation under the Power Purchase Agreement dated May _____ 2013 (the "Agreement") entered between into between the Applicant and the Beneficiary.

We irrevocably and unconditionally undertake to pay you in PKR to your account at (BANK AND ACCOUNT DETAILS TO WHICH PAYMENT WILL BE MADE) the amount you claim on the date we receive your first duly completed written demand at {ISSUING BANK, DEPARTMENT NAME AND/OR OFFICER AND ADDRESS}

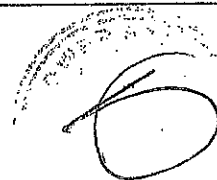
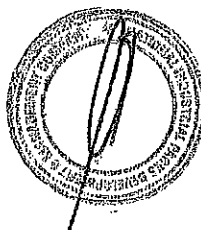
The Standby LC shall be replenished to its full amount, {3 month equivalent of Gas Cost Component, Fixed Cost Component. Financial Cost Component (_____ only) which shall become available as soon as the Standby LC is drawn upon irrespective of the number or to make a prior demand for payment upon the Applicant.

This Standby LC shall become effective on {DATE: 60 days after COD} and thereafter remain valid thereafter for a period of 12 months and shall expire on {DATE: 14th Anniversary of COD} after which we shall have no further liability to you, except in relation to any demand validity presented before expiry of the Standby LC if it remains unpaid.

The Beneficiary may assign the right to receive amounts payable hereunder to any financial institution or to any agent or security trustee of any financial institutions from which the Beneficiary has obtained or may obtain any financial facility.

This Standby LC sets forth in full the terms and conditions of our undertaking and such undertaking shall not in any way be modified, amended, limited or amplified by reference to the Agreement or any other document, Instrument, contract or agreement referred to herein or to which this Standby LC relates nor shall such reference to any document, instrument, contract or agreement shall be deemed to have been incorporated herein by reference.

This Standby LC and any dispute or claim arising out of or in connection with it or its subject matter or formation (including non-contractually disputes or claims) shall be governed by and construed in accordance with the law of Pakistan. The courts of Karachi shall have exclusive jurisdiction to settle any dispute or claim



that arises out of or in connection with this Standby LC or its subject matter or formation (including non-contractually disputes or claims).

Except to the extent it is inconsistent with the express terms of the Standby LC, this Standby LC is subject to the Uniform Rules for Demand Guarantees, 2010 revision, ICC Publication No. 758.

For and behalf of the Issuing Bank
(Authorized Signatory)

SCHEDULE J – PROJECT INSTALLATION TIMELINE

Project Name	Meeting Type	Date of Meeting	Date of Meeting
Power Plant at KCIP	Progress Review	April. 02, 2013	April. 03, 2013

Project Title:	Development of Power Plant on KCIP		Client:	National Industrial Parks (NIP)	
Subject:	Disoussion of Installing a gas engine				
Location:	2 nd Floor Block-C FTC Building, NIP D&M Head Office, Karachi:			File No:	Power plant at KCIP
Date & Time:	April 02, 2013 at 1500 hours				
Present:	Mr. Mohsin Syed	MS	National Industrial Parks Dev. & Mgmt Company	Chief Executive Officer	
	Mr. Qazi Shehryar	QS	National Industrial Parks Dev. & Mgmt Company	General Manager (Tech)	
	Mr. Saleem Ahmed	SA	National Industrial Parks Dev. & Mgmt Company (NIP)	General Manager (F & A)	
	Mr. Nazir Nagarla	NN	National Industrial Parks Dev. & Mgmt Company	Senior Manager (Sales & Marketing)	
	Mr. Taj-ul-Islam	TI	National Industrial Parks Dev. & Mgmt Company	Manager(F & A)	
	Mr. Shehzad Menton	SM	National Industrial Parks Dev. & Mgmt Company	Manager (Tech)	
	Mr. Alzaz Ahmed	AA	National Industrial Parks Dev. & Mgmt Company	Trainee Engineer	
	Mr. S.A.Jafri	SJ	Jafri Associates	President	
	Mr. Ikram-ul-Haq	IH	M/s IMS Engineering Pvt.Ltd	Chief Executive Officer	
	Mr. Ali Kabeer	AK	M/s IMS Engineering Pvt.Ltd	Manager Project	
	Mr.Tariq Mahmood	TM	M/s IMS Engineering Pvt.Ltd	Manager Projects and Sales	

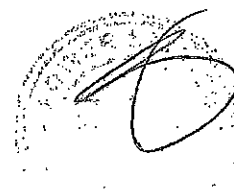
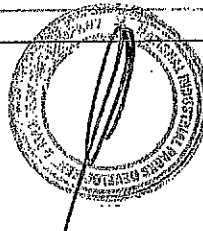



Power Plant at KCIP	Progress Review	April. 02, 2013	April. 03, 2013
------------------------	-----------------	-----------------	-----------------

"MINUTES"

Sr. Nr.	Discussions
1-	M/s IMS asked about the requirement of the load. NN informed that by March 2014 approximately 4MW of electricity would be required and by the end of year 2014 the requirement is expected to be 7MW.
2-	MS inquired about the efficiency of open cycle and combine cycle, M/s IMS's representative informed that efficiency of open cycle and combine cycle are 32% and 44% respectively.
3-	SJ asked about options regarding installation of plants. M/s IMS informed that there are different options however since the power requirement would be 7MW by the end of 2014, therefore Gas Turbine would be feasible as per original bid.
4	MS asked about revision of rates. M/s IMS replied that their rates would not be revised and it would be as per original bid. MS agreed.
5-	It was informed by SA that approval of bid has already been obtained by board of NIP in its 26 th Meeting. Therefore there is no need to take re-approval however the matter may be put up for information only.
6-	MS inquired about the Concession Agreement. It was informed that final agreement has been forwarded to us by our legal advisor and same has been forwarded to Corporate (NIP) for review. It was agreed that once all formalities are completed, the concession agreement would be signed by both the parties.
7-	M/s IMS requested that NIP should give a letter informing the requirement of a power by end of 2014. NIP management confirmed that a letter in this regard would be sent before the end of day.

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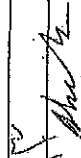
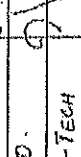

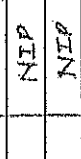
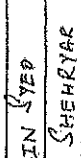
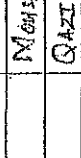







KORANGI CREEK INDUSTRIAL PARK
Power Plant
Progress Review Meeting

Date : 2nd April 2013

Time : 3:00 PM

Venue: NIP Head Office Karachi

S. No	Name of Applicant	Organization	Designation	Signature
1-	MOHAMMAD SYED	NIP	CEO	
2-	QAZI SHEHRYAR	NIP	GM-TECH	
3-	SHEHZAD MEMON	NIP	MANAGER (TECH)	
4-	TAJ-UL-ISLAM	NIP	MANAGER (F&H)	
5-	S. A. JAZALI	Isa		
6-	SALEEM ALI	NIP	GMF	
7-	ALI VAREED	inv		
8-	ARIQ MAHMOOD	inv		
9-	PERKHAH ALI	inv		
10-	ARIF AHMED	NIP	Traveller Engr	
11-	NADIR NAGAR	NIP	Sr. Mgr. Safety	
12-				
13-				

IMS Engineering (Pvt) Ltd.
Instrumentation & Mechanical Systems
 I&MS Center, 10-K, Block-6, P.E.C.H.S., Karachi - 75400, Pakistan
 Tel: 3431-3196, 3431-3197 Fax: +(92-21) 34313198 Email: info@ims.com.pk



Instrumentation,
 Fire Management
 and Mechanical
 Systems,
 Suppliers and
 Contractors.

National Industrial Parks
 2nd Floor, Block C
 Finance and Trade Centre
 Karachi

April 03, 2013
 Ref: IMS/ NIP-29/13

Fax: 35631069

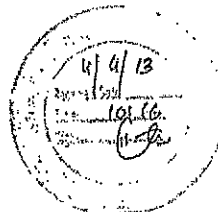
Attn: Mr. Mohsin Syed
 Chief Executive Officer

Sub: Discussion of Power Generation Options for KCIP

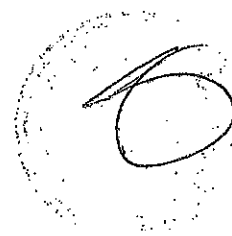
Dear Sir,

In reference to the meeting between NIP and IMS Engineering Pvt Ltd, held on April 02, 2013 and your subsequent letter ref # NIP/KCIP/800/52 received from NIP dated April 02, 2013 we would like to state as follows:

1. In view of the revised power demand of 7 mW by end of 2014, we will revert back to the original concept of Gas Turbine Generation as was originally bid by us as per your RFR requirements.
2. Due to the withdrawal of KESC, who would have initially taken up most of 48mW we will now follow "Incremental System" for prevailing power requirements, based on your anticipated power demand of 4 mW by mid of 2014 and 7 mW by end of 2014.
3. We intend to start off with a Gas Turbine Open Cycle generation of ~5mW by mid of 2014 and bring it up to ~7 mW by end of 2014, on combined cycle mode. Thereafter the



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periodic increase in the power demand will be reviewed mutually between us and NIP and additional power capacity will be added as and when required.

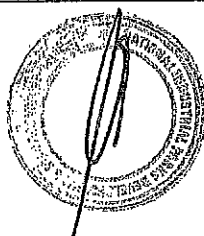
4. As the originally approved tariff rate was calculated as per Oct 2010 input prices and US Dollar parity, the tariff rate will be reviewed to reflect the changes in fuel prices and associated cost overheads as per present applicable inputs.
5. The tariff rates provided are as follows:
 - a. The pre-approved tariff rate of 5.6 Rs/kWh was based on 48 mW at 95% Load Factor with input prices as of Oct 2010
 - b. The revised tariff of 6.99 Rs/kWh is based on 48 mW at 95% Load Factor with input prices as of Jan 2013

Please note that the installation of Gas Turbine open cycle facility normally takes 12-14 months and for combined cycle a timeframe of 12-20 month should be expected.

Reverting back to Gas Turbine Generation; we intend to supply/install a Tri-Fuel based Gas Turbine that is capable of operating on Natural Gas, Liquefied Petroleum Gas and Diesel Fuel. We foresee operation on LPG during periods of unavailability of Natural Gas.

Conversion from Natural Gas to LPG and vice versa requires 15 minutes of operation on diesel fuel. Therefore, we will share consumption rates of the selected Gas Turbine model on all three fuels (NG, LPG and Diesel).

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In conclusion we would like to inform you that we have implemented a separate organization named Power Station (Pvt) Ltd to specifically handle this project, the registered office is the same as IMS Engineering (Pvt) Ltd. It is expected that on finalization of our deliberations, the contractual documents will be made in the name of Power Station (Pvt) Ltd.

Attached in Appendix - A are the efficiencies and technical details associated with the selected Gas Turbine Model (GPB70).

Attached in Appendix - B are the different tariff rates for 48 mW power plant at 95% load factors for input prices for Oct 2010 and Jan 2013

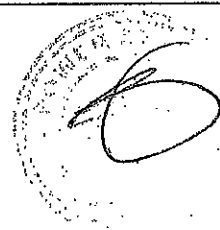
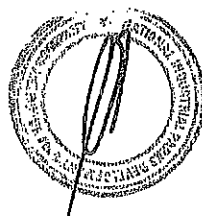
Thank you,

Yours Sincerely,

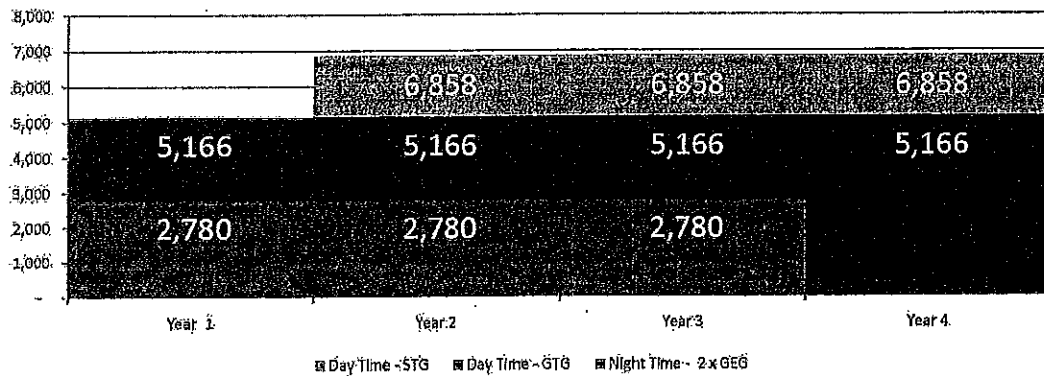


Ikram-ul-Haq
Chief Executive Officer
IMS Engineering (Private) Limited

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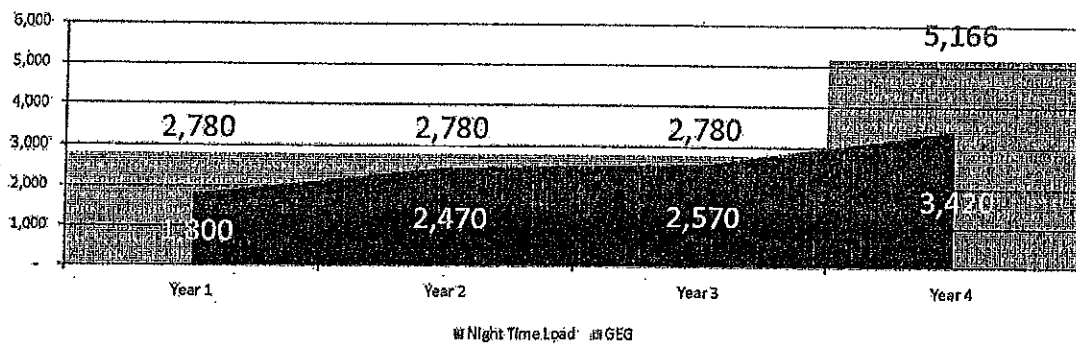
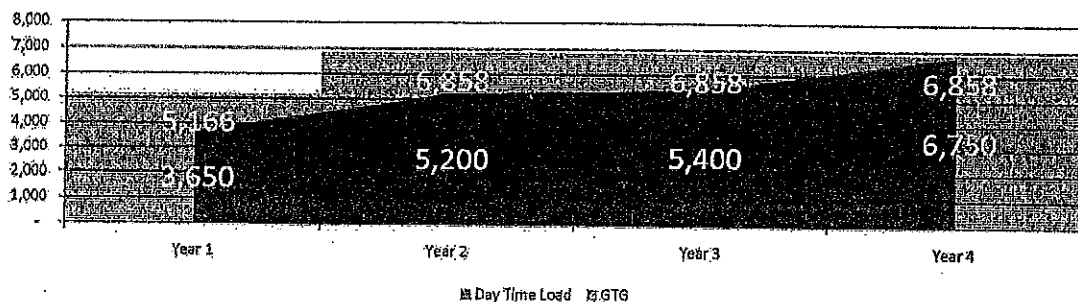


Power Generation Overview



- Year 1 : Intermittent operation of GTG and GEG
- Year 2 onwards : Year 1 : Intermittent operation of GTG + STG and GEG
- Year 3 : Day time operation of GTG + STG and night time operation of GTG with GEG in backup
- An average differential of Rs. 3/4 from Effective KESC Unit rate is being maintained

Power Generation Tariff Overview



**GOVERNMENT OF PAKISTAN
BOARD OF INVESTMENT**



Modified & Amended

Special Economic Zones Act, 2012

As amended up to 31st December 2015

REGISTERED No. M-302

L-7646

The Gazette of Pakistan

**EXTRAORDINARY
PUBLISHED BY AUTHORITY**

ISLAMABAD, THURSDAY, SEPTEMBER 13, 2012

PART 1

Act, Ordinances, President's Orders and Regulations

NATIONAL ASSEMBLY SECRETARIAT

Islamabad, the 13th September, 2012

No. F. 22(7)/2012-Legis.- The following Act of Majlis-e-Shoora (Parliament) received the assent of the President on the 12th August, 2012 and is hereby published for general information:

ACT No. XX OF 2012

An Act to provide for setting up and operation of special economic zones in Pakistan

WHEREAS it is necessary and expedient to promulgate a law for the creation, development and efficient operation of special economic zones through provision of a legal and regulatory frame work to encourage domestic and international investors for promotion and establishment of industrial infrastructure and for other matters connected or ancillary thereto;

It is hereby enacted as follows:-

(1203)

[2973(2012)/Ex Gaz.]

Price: Rs. 20.50

1. Short title, extent and commencement.- (1) This Act may be called the Special Economic Zones Act, 2012.

(2) It extends to the whole of Pakistan.

(3) It shall come into force on such date as the Federal Government may, by notification in the official Gazette, appoint and different dates may be appointed for coming into effect of different provisions of this Act and any reference to commencement shall generally refer to the commencement of this Act but commencement of any provision that comes into force subsequent to the general commencement shall be treated from the date of coming into force of the respective provision and not the general commencement.

2. Act to override other laws.- The provisions of this Act shall have force notwithstanding anything to the contrary contained in any other law for the time being in force.

3. Definitions.- In this Act, unless there is anything repugnant in the subject or context,-

- (a) "Approvals Committee" means the committee constituted under section 7;
- (b) "arbitration" shall include arbitration under the applicable laws of Pakistan as well as arbitration under any applicable international regime, whether selected contractually through an agreement in writing or available to a party or parties as a result of an international agreement accorded or ratified;
- (c) "BOA" means the Board of Approvals constituted under section 5;
- (d) "BOI" means the Board of Investment established under the Board of Investment Ordinance, 2001 (XV of 2001);
- (e) "capital equipment" means plant, machinery or equipment, accessories, and component part of machinery and equipment identifiable for use in or with machinery required for economic activities and machinery includes machinery and equipment of any description, such as is used in industrial process, manufacture, production or processing of other goods and rendering services, except the goods that are consumed in the manufacturing, production or processing of goods or provision of services;

- (f) "developer" means an enterprise which has entered into a development agreement with a SEZ Authority;
- (g) "development agreement" means a duly approved agreement between SEZ authorities and agreed to and endorsed by the BOA and a developer that authorises a developer to develop, establish and operate a SEZ;
- (h) "economic zone" means a geographically defined and delimited area which has been notified and approved for economic, industrial and commercial activities;
- (i) "existing zones" means the export processing zones, industrial zones and other similar entities in existence at the time of the commencement of this Act and includes but not limited to the following, namely:-
 - (i) "export processing zones" means an economic zone which is established under the Export Processing Zone Authority Ordinance, 1980 (IV of 1980);
 - (ii) "extra-territorial zone" means an economic zone of a type that is to be deemed to be outside the customs territory of Pakistan;
 - (iii) "free trade zone" means an economic zone that shall be deemed to be outside the customs territory of Pakistan with respect to which the BOA shall approve special facilities for trade, transshipment and re-export operations in accordance with applicable legislation as for the time being imposed in Pakistan;
 - (iv) "hybrid export processing zone" means an economic zone that shall be deemed to be outside the customs territory of Pakistan in which goods are manufactured and from which services are provided, both for exportation to countries other than Pakistan as well for export into Pakistan;
 - (v) "multilateral economic zone" means an economic zone in which all zone enterprises are required to be beneficially owned by nationals, residents or corporate entities of one or more particular countries;
 - (vi) "reconstruction opportunity zone" means an economic zone from which the exports of goods and services has been recognised by

any country or jurisdiction other than Pakistan as being eligible for reduced tariff duties and other benefits;

(vii) "regional development zone" means an economic zone wherein economic activities are promoted so as to develop particular regions and industries; and

(viii) "sector development zone" means a regional development zone in which permissible economic activity shall be limited to one or more sectors as notified by the BOA;

(j) "misconduct" means any conduct of a member or Chairperson of the Provincial SEZ Authority that is prejudicial to the good order and management of the SEZ Authority or a SEZ and includes but not limited to the following, namely :-

(i) a failure to disclose an interest of the member or Chairperson in a transaction related to a SEZ or an interest of the member's parent, spouse, brother, sister, child, or spouse of a parent, brother, sister or child;

(ii) any act or omission which is ultra vires *of this Act*;

(iii) any act or omission which lacks good faith; or

(iv) any act or omission which is inconsistent with the fiduciary duties of such member or Chairperson;

(k) "Provincial investment promotion authority" means an investment promotion agency, by whatever name called, formed by a Province to work as focal authority to promote domestic and foreign investment in that Province such as Sindh Board of Investment established in Sindh and Punjab Board of Investment and Trade or any other similar entity;

(l) "SEZ Authorities" mean the Provincial SEZ Authorities established under section 10;

(m) "SEZ Committee" means the authority chartered by the BOA at each SEZ under section 23;

- (n) "Special Economic Zone" or "(SEZ)" means a geographically defined and delimited area which has been approved and notified by the BOA"¹.
- (o) "zone admission criteria" means the criteria under this Act, and to be applied by developers in deciding whether or not to admit an enterprise into a particular SEZ including thereof zone approval criteria that means the criteria to be applied by the SEZ Authority and the BOA in deciding whether to allow or not to allow a particular area to be developed as a SEZ;
- (p) "zone application" means an application submitted in accordance with the provisions of this Act by an SEZ Authority seeking the notification of an area as a special economic zone;
- (q) "zone development plan" means a business plan for developing a SEZ;
- (r) "zone enterprise" means an enterprise admitted into a SEZ by a developer; and
- (s) "zone regulations" mean regulations made by the BOA under this Act.

4. Establishment of special economic zones.- The Federal Government and Provincial Governments may establish special economic zones by themselves or in collaboration with private parties under various modes of collaboration including public-private partnership or exclusively through the private parties as provided under this Act.

5. Board of Approval.- (1) There shall be a Board of Approvals, hereinafter called BOA, consisting of:-

- (i) the Prime Minister of Pakistan who shall be the Chairperson of the BOA;
- (ii) the Minister for Finance who shall be the Vice Chairperson of BOA;
- (iii) the Minister for Industries;
- (iv) the Minister for Production;
- (v) the Minister for Commerce;
- (vi) the Minister for State and Frontier Regions Divison;
- (vii) two members of Majlis-e-Shoora (Parliament) to be nominated by the Prime Minister (one from each House);
- (viii) the Chairman of the BOI;

¹ Section 3, clause (n) substituted through Special Economic Zones (Amendment) Ordinance, 2015

- (ix) the Deputy Chairman Planning Commission;
 - (x) the Chief Minister of each Province;
 - (xi) the Chairman of the Federal Board of Revenue;
 - (xii) Governor, State Bank of Pakistan;
 - (xiii) Secretary BOI;
 - (xiv) Executive heads of the Provincial investment boards by whatever names known or if no such board is established a nominee of the Government of such Province, having adequate relevant professional experience, the tenure of such nominees shall be three years.
 - (xv) the President of the Federation of the Pakistan Chambers of Commerce and Industry;
 - (xvi) the President of the Pakistan Business Council;
 - (xvii) the President of the Overseas Chamber of Commerce and Industry; and
 - (xviii) a professional having relevant adequate experience to be nominated by the Prime Minister of Pakistan.
- (2) The meeting of the BOA shall be convened on the orders of the Chairman BOA or on the recommendations of BOI or the Provincial SEZ Authority.
- (3) The BOA shall meet as frequently as required but not less than twice a year.
- (4) Fifty percent of the members shall constitute quorum of the BOA.
- (5) Where the Chairperson is not present, the Vice-chairperson shall chair the BOA's meeting and if both are not available, a member designated by the Chairperson shall preside.
- (6) The decisions of the BOA shall be taken by majority of the total membership present and voting.
- (7) The BOA shall adopt its own rules of procedure.
- (8) Secretary BOI shall also act as Secretary of the BOA.

6. Functions and responsibilities of the BOA.- The BOA- may-

- (a) approve such regulations for the implementation of this Act as are applicable to all SEZs or to a particular group of SEZ or a particular SEZ;
- (b) approve or reject zone applications;
- (c) approve or reject development agreements;
- (d) examine and decide upon policy issues submitted to it by SEZ Authorities or by developers;
- (e) co-opt on the members of the Approvals Committee as necessary;
- (f) notify with approval of relevant authorities additional benefits under sub-section (2) of section 34;
- (g) cancel development agreement;
- (h) review and direct actions on annual reports submitted by SEZ authorities;
- (i) annually review the implementation of this Act with a view to improving policies relating to SEZs; and
- (j) take any other steps it deems appropriate in order to advance the objectives of this Act.

7. Approvals Committee.- (1) There shall be an Approvals Committee that shall be chaired by the Chairman of the BOI and shall consist of the following, namely:-

- (i) executive heads of the provincial investment boards or companies or agencies, and where these do not exist a representative equivalent to a Provincial Secretary designated by the concerned Province;
- (ii) representatives of the Ministries of Finance, Commerce, Industries and Production and State and Frontier Regions Division not below the level of an Additional Secretary to the Government;
- (iii) private sector representatives representing different sectors and regions to be notified and two co-opted members by special invitation with a three-year term extendable at the discretion of the BOA; and
- (iv) with approval of BOA, co-opted members from concerned Federal and Provincial Government for specific cases.

(2) The Approvals Committee shall exercise all such powers and responsibilities as are delegated to it by the BOA, subject to such conditions as it may deem fit.

(3) The BOA may delegate all or any of its remaining powers and responsibilities to the Approvals Committee.

(4) A decision taken by the Approvals Committee shall be submitted to BOA at its meetings or by circulation for approval.

(5) The BOA may, at any time, exercise any responsibility or any power which it has delegated to the Approvals Committee.

8. Functions of BOI.— (1) The BOI as the Secretariat of BOA and Approvals Committee shall-

(a) be responsible for the co-ordination of all activities pertaining to SEZs, developers and zone enterprises, including the preparation of all documentation for consideration by the BOA, and for ensuring the implementation of all decisions of the BOA;

(b) process all zone applications submitted by SEZ Authorities for consideration of BOA;

(c) process all applications for additional incentives in accordance with subsection (2) of section 34;

(d) review all development agreements proposed by SEZ Authorities;

(e) be responsible for the international and domestic promotion of investments into SEZs; and,

(f) facilitate the interaction of developers and zone enterprises with all other Federal, Provincial and other governmental authorities as well as with international financial and developmental institutions.

(2) BOI shall act as SEZ Authority for the Islamabad Capital Territory as provided in section 10.

(3) BOI shall support and facilitate the SEZ Authorities, if requested.

9. Responsibilities of Provincial Investment Promotion Authorities.- (1) A Provincial investment promotion authority shall be responsible within its Province of jurisdiction for the following, namely:-

- (a) to assist in the operation of the Provincial SEZ Authorities;
- (b) to be the focal entity responsible for the investment promotion;
- (c) may assist the SEZ Authorities and the developers in acquisition and other land related matters including but not limited to necessary easement issues;
- (d) to ensure infrastructure development linkages between authorities within the SEZ; and outside the SEZ;
- (e) to facilitate the developers and zone enterprises in dealing with all provincial governmental authorities for smooth and systematic resolution of issues as and when they arise; and
- (f) to facilitate the developers and enterprises in complying with environmental regimes and social development.

10. SEZ Authority.- (1) There shall be established for each Province, an authority to be known as the SEZ Authority of that Province

(2) Every SEZ Authority shall be a body corporate by the name aforesaid, having perpetual succession and a common seal, with a power, subject to the provisions of this Act and any regulations, to acquire, hold and dispose of property, both movable and immovable, and to contract and shall, by the said name, be entitled to sue and to be sued.

(3) Each SEZ Authority shall consist of,-

- (a) a Chairperson, who shall be the Chief Minister of the concerned Province or a person appointed by the Chief Minister;
- (b) a Vice- Chairperson, who may be the Minister or the Advisor in charge of the investment department and where no such department exists, any member of the Provincial cabinet nominated by the Chief Minister of the concerned Province;
- (c) a Chief Executive Officer who may be appointed by the Chief Minister of the Province concerned and may be the Secretary of the SEZ Authority;

- (d) Secretary of the Provincial investment department and where no such department exists, the executive head of the Provincial investment promotion authority by whatever name it exists;
 - (e) Secretaries of the Provincial industries, finance, commerce, investment, works and services, livestock, agriculture and planning and development departments;
 - (f) Two members to be appointed by the Chief Minister of the Province concerned and two other members to be appointed by the BOA; and
 - (g) a member to be appointed by the concerned Chamber of Commerce and Industry where the SEZ is proposed. If there is no Chamber of Commerce then a member of the Chamber of Commerce of that respective area to be appointed.
- (4) Each SEZ Authority may acquire land in its respective Province in accordance with the Land Acquisition Act, 1894 (I of 1894).
- (5) Each SEZ Authority shall, subject to the approval of BOA, establish its rules and procedures.
- (6) Where the Chairperson is not present, the Vice-Chairperson shall chair the SEZ Authorities meeting.

11. Requirements for all zone applications.- (1) Every zone application submitted for approval to the BOA shall identify the type of SEZ proposed and include-

- (a) a basic business concept or model for the proposed SEZ to be submitted;
- b) parameters for zone admission criteria; and
- c) a preliminary zone development plan which shall-
 - (i) define the geographic boundaries of the proposed SEZ;
 - (ii) set out the basic infrastructure development requirements, both inside and outside the proposed SEZ, necessary for the proper functioning of the proposed SEZ;
 - (iii) set out the land requirements of the proposed SEZ;

- (iv) set out the manner in which land required shall be procured, including specifically whether land will need to be acquired under the Land Acquisition Act, 1894 (I of 1894); and
- (v) set out what criteria shall be applicable to the admission of zone enterprises into that SEZ.

(2) The zone application to be submitted along with a proposed development agreement under section 14 and the criteria on which a developer shall be selected for that SEZ.

12. Approval of zone applications.— (1) All zone applications shall be submitted to the BOA by the SEZ Authority of the Province in which the proposed SEZ shall be located.

(2) The BOA shall review every zone application submitted to it by the SEZ Authority to ensure that the proposal is in conformity with the provisions of this Act, any applicable regulations made under this Act and other applicable provisions of law.

13. Approval of development agreements.—(1) If a zone application is approved by the BOA, the concerned SEZ Authority shall select a developer in accordance with any applicable zone regulations except as provided in section 4. Such zone regulations shall require that envisaged development agreements be notified for competitive bidding.

(2) After negotiating a development agreement, the concerned SEZ Authority shall submit a final agreement for approval to the BOA.

(3) There shall be a provisional approval by concerned SEZ Authority subject to fulfilment of all such conditions necessary for final approval according to laid down criteria.

(4) The BOA may condition its approval of a development agreement on the fulfilment of such conditions as it deems fit and according to the laid down criteria.

(5) After final approval, the development agreement shall be signed jointly by the Secretary of the BOA on behalf of the Federation of Pakistan and by the chief executive officer of the concerned SEZ Authority on behalf of the respective Provincial Government.

(6) If the BOA does not approve a development agreement submitted to it, the concerned SEZ Authority, that submitted the development agreement, may resubmit the development agreement after either renegotiating the terms of the proposed development agreement with the developer concerned or after reaching agreement with a different developer selected in accordance with the applicable zone regulations.

(7) In case of any grievances, a developer may approach BOA directly or through the SEZ Authority and BOA shall have the authority to consider, modify or set aside any decision.

14. Simultaneous approval of zone application and development agreement.- The SEZ Authority may simultaneously submit both a zone application and a development agreement to the BOA for provisional approval, provided that,-

- (a) the developer in question either owns all immovable property in the proposed SEZ or holds leasehold rights; and
- (b) no additional incentives shall be granted by the SEZ Authority under sub-section (2) of section 34.

15. Approval of existing zones.- (1) Any existing zone may apply to the SEZ Authority in which it is located for submission of a zone application on its behalf.

(2) From the commencement of the Special Economic Zones (Amendment) Ordinance, 2015, only new entrants and new industries that are setup after the establishment of the SEZ may avail SEZ enterprise benefits under this Act.¹

(3) ²[Omitted]

(4) ³[Omitted]

(5) ⁴[Omitted]

16. Zone approval criteria.-

⁵[Omitted]

⁶(1) Unless otherwise decided by the BOA, the following provisions shall form part of the zone approval criteria, namely:-

- (a) a SEZ shall have a minimum size of at least fifty acres;

¹ Substituted through Special Economic Zones (Amendment) Ordinance, 2015

² Omitted through Special Economic Zones (Amendment) Ordinance, 2015

³ Omitted through Special Economic Zones (Amendment) Ordinance, 2015

⁴ Omitted through Special Economic Zones (Amendment) Ordinance, 2015

⁵ Omitted through Special Economic Zones (Amendment) Ordinance, 2015

⁶ Renumbered through Special Economic Zones (Amendment) Ordinance, 2015

- (b) not more than thirty percent of the entire area of a SEZ shall be used for amenities (including commercial areas), infrastructure and residential/labour colonies;
- (c) public-owned land, if used for SEZs shall be leased for a period of at least fifty years extendable for further period as laid down by the competent forum;
- (d) Developers must undertake to comply with all environmental, labour and other applicable legislation in force in Pakistan;
- (e) zone enterprises must begin construction of facilities within six months and assume regular business operations within twenty four months of their approval as zone enterprises and after receipt of all required licenses and permits;
- (f) within six months the developer is bound to take all necessary approvals to start construction activities, failing which that title will be withdrawn and agreement will be terminated and land will be returned;
- (g) title to land may be registered in the name of zone enterprises only after they have performed business operations in the SEZ concerned for at least six months;
- (h) there shall be no real estate activities in the zone as this would result to with-drawl of the title of land and termination of the agreement; and
- (i) article of association of the Zone developer shall be approved by the Provincial SEZ Authority in accordance with the regulatory framework prescribed by BOA.

¹(2) In case the SEZ Authority is satisfied with the justification put forward for delay in performance of a responsibility by an enterprise in a SEZ, it can give reasonable relaxation in time frame for performance of the particular responsibilities.

17. Functions and powers of SEZ authorities.- The SEZ authorities shall be responsible to:-

¹ Renumbered through Special Economic Zones (Amendment) Ordinance, 2015

- (a) prepare zone applications in accordance with this Act and applicable zone regulations;
- (b) select developers in accordance with the provisions of this Act and the applicable zone regulations;
- (c) negotiate development agreements in accordance with the provisions of this Act and applicable zone regulations;
- (d) assist developers upon award of a development agreement in acquiring land and accessing public utilities in accordance with the zone development plan;
- (e) prepare zone regulations for particular SEZ;
- (f) co-ordinate with Federal and Provincial authorities and ensure the building of infrastructure outside the boundaries of SEZ;
- (g) serve as liaisons and facilitating agencies in accordance with the provisions of section 29;
- (h) facilitate the availability of public utilities to zone enterprises in accordance with the zone development plan;
- (i) liaise with all relevant Federal and Provincial authorities to ensure the security of SEZs;
- (j) monitor the proper implementation of streamlined administrative procedures in SEZs under section 28;
- (k) monitor the compliance of developers with zone regulations as well as the compliance of developers with their obligations under development agreements and suspended development agreements, in case of violation of terms of development agreement by the developer, pending final decision by BOA.
- (l) monitor the compliance of zone enterprises with their obligations under regulations;
- (m) review of the activities of the developers and zone enterprises regularly but not less than once a year; and
- (n) report bi-annually to the BOA with respect to SEZs in the Provinces concerned;

18. Suspension and removal of members of SEZ Authorities.-(1)—The Chief Minister may order removal of either the Chairperson, if so appointed by him, or any member of the Provincial SEZ Authority.

2) If either the Chairperson or any member of a Provincial SEZ Authority is removed, their replacement shall be appointed by the Chief Minister;

19. Eligibility as developer.—Unless otherwise decided by the BOA with respect to a particular SEZ or type of SEZ, any entity shall be eligible as a developer which is incorporated under the laws of Pakistan.

20. Responsibilities of developers.-(1) With the exception of existing zones which have been approved as SEZs, all SEZs shall be developed and operated by developers with in a specified time period as mentioned in the development agreement.

(2) All developers shall-

- (i) implement their zone development plans in accordance with the terms of development agreement.
- ii) approve zone enterprises and allot land to such enterprises in accordance with the applicable zone admission criteria, zone regulations and the terms of the development agreement; and
- (iii) monitor and ensure the compliance of zone enterprises with all applicable zone regulations.

(3) Subject to default on the foregoing unless otherwise, the agreement shall stand terminated..

21. Development agreements.-(1) Each development agreement shall include-

- (a) all undertakings of the developer regarding the development and operation of the SEZ concerned, with the zone development plan or business concept of proposed SEZ model as an integral part of the development agreements; and
- (b) all authorities conferred on the developer with respect to the SEZ concerned, including specifically any provisions pertaining to the developer's authority to-

- (i) admit enterprises into the SEZ in accordance with the zone admission criteria and allot land to them in accordance with agreed eligibility criteria and procedures;
 - (ii) act as a liaison and facilitating agency between the relevant SEZ authority and zone enterprises;
 - (ii) all financial obligations of the developer, including any obligation to make payment for the allocation of land and provision of services by public authorities; and
 - (iv) clear provisions regarding the responsibility of maintenance of infrastructure and utility services.
- (2) A development agreement shall also include-
- (i) rights, protections and entitlements of the developer with respect to the SEZ concerned, established or allowed under this Act or any other applicable law;
 - (ii) rights, protections and entitlements of zone enterprises in the SEZ concerned established or allowed under this Act or any other applicable law, together with a prescribed procedure for the invocation of such rights, protections and entitlements by the developers;
 - (iii) provision for the settlement of disputes, including disputes on behalf of zone enterprises through arbitration; and
 - (iv) rights or titles and other legal authority of the Provincial SEZ Authorities superior to it in terms of the provisions of this Act.

22. Sanctions against developers.- (1) The SEZ Authority may, if it is satisfied after notice and a hearing that a developer is not acting in accordance with the terms of its development agreement, or is acting in violation of applicable zone regulations or applicable legislation and has failed to rectify such violation despite notice to this effect, it may suspend the development agreement of that developer and move for cancellation of such agreement to the BOA or impose such other penalty as may be provided under the applicable zone regulations or the development agreement.

(2) Upon receipt of an application from the Provincial SEZ Authority seeking cancellation of a development agreement, the BOA shall give notice to the developer

concerned, asking it to show cause why its development agreement should not be cancelled or why such lesser penalty as may be provided under applicable zone regulations should not be imposed.

(3) Pending the final decision of the BOA on a proposal for cancellation of a particular development agreement, the SEZ Authority may appoint an interim administrator or take such interim measures as it is necessary to do so-

(a) in the public interest; or

(b) to prevent any of the affairs of any SEZ being conducted in a manner detrimental to the interests of stakeholders, zone enterprises or other persons whose interests are likely to be affected or in a manner prejudicial to the interests of the SEZ.

(4) Pending the final decision of the BOA, on a proposal for cancellation of a particular development agreement, the SEZ Authority may, if it is satisfied that it is necessary to secure the proper management of any zone, issue directions to developers generally, or to any developer in particular to carry out such changes as are necessary to rectify the situation and the developers shall be bound to comply with such directions.

(5) Following a hearing in person, in which the developer may be represented by counsel, the BOA may impose such penalty as is provided by the applicable zone regulations or the development agreement, which may include cancellation of a development agreement or cancellation of any benefits allowed to a developer, provided that any cancellation of benefits to a developer shall be without prejudice to the rights and privileges of zone enterprises.

(6) The BOA may only cancel a development agreement if it finds that-

(i) the developer has violated its development agreement; and

(ii) that the developer has failed to rectify such violation despite notice.

(7) In addition to the rights of a developer to seek relief through arbitration, a developer aggrieved by any decision of the BOA, BOI or by the imposition of sanction by the SEZ Authority or by the suspension or cancellation of its development agreement may appeal before the High Court of the relevant Province.

23. SEZ Committees:- (1) The BOA shall charter an SEZ Committee for each SEZ as per the applicable zone regulations.

(2) The membership of a SEZ committee shall consist of representatives from the developer, BOI, provincial investment promotion agency, SEZ Authority and concerned district Government. The developer shall appoint the chairperson of the committee.

(3) Each SEZ committee shall have responsibilities to administer and enforce SEZ benefits and rules as well as provide facilitation between the SEZ, its enterprises and the government with responsibilities including to-

- (a) examine and approve SEZ entry applications in accordance with zone admissions criteria;
- (b) provide for certification of zone enterprises;
- (c) conduct oversight of enterprises;
- (d) enforce the building code of the SEZ;
- (e) coordinate between the developer and government entities and utility providers during construction;
- (f) assist Zone enterprises in obtaining approvals and registrations;
- (g) serve as the point of contact between the zone enterprise and utility providers; and
- (h) facilitate between enterprises and government regulators and tax authorities.

(4) SEZ Committees shall execute their responsibilities according to their standard operating procedure in accordance with zone regulations.

24. Admission of zone enterprises.- (1) Enterprises shall be admitted into a SEZ by the developer in accordance with applicable zone admission criteria, the zone regulations and the terms of the development agreement.

(2) Any enterprise which is refused admission into a SEZ by a developer may appeal to the SEZ Authority of the relevant Province, which shall have the power to direct the relevant developer to allow admission to the enterprise in question in accordance with the applicable zone regulations and development agreement.

25. Sanctions against zone enterprises.- (1) The BOA shall issue zone regulations which provide for sanctions against zone enterprises and the manner in which such sanctions may be imposed.

(2) The BOA may, with respect to particular SEZs, delegate its authority under subsection (1) to SEZ Authorities.

(3) The SEZ Authority may if it is satisfied that it is necessary to do so to secure the proper management of any zone enterprise, issue directions to zone enterprises generally or to any zone enterprise in particular to carry out such changes as are necessary to rectify the situation and the zone enterprise shall be bound to comply with such directions.

(4) The SEZ Authority may only expel a zone enterprise from a SEZ if it finds that-

- (i) the zone enterprise is in violation of its obligations; and
- (ii) the zone enterprise has failed to rectify such violation despite notice.

(5) The SEZ Authority may appoint interim administrator or take such interim measures for a period of not more than one month if it is satisfied that it is necessary to do so-

- (i) in the public interest; or
- (ii) to prevent any of the affairs of any SEZ being conducted in a manner, detrimental to the interests of stakeholders, developers, zone enterprises or persons whose interests are likely to be affected or in a manner prejudicial to the interests of the SEZ.

(6) The action taken by the SEZ Authority in accordance with sub-section (5) shall be referred to BOA within seven days for ratification by BOA, The BOA shall decide the matter and issue the guidelines and instructions about operations of zone enterprise within fifteen days.

26 Land regime.- (1) The Provincial Government of each Province or any concerned authority shall nominate, for each SEZ, a sub-registrar who shall be the exclusive authority with which all documents relating to that SEZ shall be liable to be registered under this Act, zone regulations and any other applicable law.

(2) Notwithstanding any other law in force, a developer may not sell, sub-lease or otherwise transfer any rights with respect to any immovable property within a SEZ except through a duly registered instrument.

27. Public utilities and transportation links.-(1) Unless provided otherwise in a particular development agreement, it shall be the responsibility of-

- (i) the Federal and Provincial Governments to ensure the provision of gas, electricity and other utilities at the designated zero point of each SEZ;

- (ii) the Federal and Provincial Governments to ensure adequate road access to the SEZ; and
- (iii) each developer to ensure, within a particular SEZ, the supply of gas and electricity to all zone enterprises as well as the availability of all other public utilities required for such areas as envisaged in the development agreement.

(2) Unless provided otherwise in a particular development agreement and notwithstanding anything to the contrary contained in the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997), each developer shall have the right to set up a captive electric power generation plant or install a hydel power generator of sufficient size to cater to the expected demand for electricity within a particular SEZ and to sell and distribute only the excess electricity so generated within and outside that particular SEZ in accordance with the applicable regulations.

28. Applicable operating administrative procedures .- (1) The BOA, the BOI and the SEZ Authorities shall promote the adoption of simplified administrative procedures for SEZs and zone enterprises with the relevant Federal and Provincial authorities and agencies. Such procedures shall in particular facilitate the-

- (i) issuance of licenses, permits and other approvals to zone enterprises required for their business activities;
- (ii) satisfaction of customs and other export or import requirements by zone enterprises;
- (iii) fulfilment of tax obligations by Zone Enterprises; and
- (iv) authorisation of electronic communications and Modes of e-governance

(2) Procedures under sub-section (1) shall endeavour to-

- (i). substitute notifications and registrations for license, permit and other approval requirements; and
- (ii) authorise approvals on a no objection basis within a specified period.

29. Assistance by the BOI and SEZ Authorities.- (1) The BOI shall act as a liaison and facilitating agency between:-

- (i) all Federal Ministries, authorities and agencies; and
 - (ii) SEZ Authorities, developers and zone enterprises.
- (2) The BOI shall act as a one stop shop in its responsibilities under sub-section (1).
- (3) The SEZ Authorities shall act as a liaison and facilitating agency between,-
 - (i) all departments, authorities and agencies of the relevant Province, including all local government and municipal authorities and agencies; and
 - (ii) developers and zone enterprises.
- (4) To the extent practicable, SEZ Authorities in the Provinces or in any other area shall seek to enter into administrative arrangements with tax, customs, labour and other authorities under which SEZ authorities may exercise certain administrative functions on behalf of such authorities, which arrangements may include a secondment of officials with decision-making power from such authorities to SEZ Authorities.
- (5) All Federal and Provincial Ministries and departments, authorities and other agencies shall fully co-operate with the BOI and SEZ Authorities in facilitating the activities of developers and zone enterprises and carry out the requisite functions within the time frame stipulated under the regulatory framework prescribed by BOA for the implementation of this Act.

30. Labour laws.- All labour and employment laws of Pakistan shall be applicable to SEZ in the same manner as they are to all territories within Pakistan.

31. Employment of key persons.-Notwithstanding anything contained in any other law, the BOA may issue special rules for the employment by zone enterprises of key managerial and technical persons who are not citizens of Pakistan, relating to the terms and conditions of their contracts as well as with respect to the issuance of visas, temporary residence permits and temporary work permits for such key persons and their dependents provided further that such rules shall only be issued after consultation with-

- (i) the Ministry of Interior;
- (ii) the Ministry of Foreign Affairs; and
- (iii) such other Ministry or Department as the BOA may direct.

32. **Security.-** (1) Each Province or any concerned authority shall be responsible for providing security for the protection of SEZs.

2) Pending the creation of a special police force, each Province or any concerned authority shall designate special police units responsible for the protection of SEZs within that area.

33. ¹[Omitted]

34. **Incentives for SEZs.-** (1) On execution of development agreements, the developer of a particular SEZ as well as all zone enterprises in that SEZ shall be entitled to benefits set out in section 36 and 37 respectively.

(2) Within the objective of promoting hi-tech industries or particular regions, the BOA may grant additional benefits to a particular category of SEZs, zone enterprise, regions or sectors provided that-

- (i) such additional benefits may only be granted if the BOA finds them to be justified on the basis of an economic impact assessment;
- (i) such additional benefits, if granted conditionally, may be liable to be forfeited with retroactive effect if it is finally determined that a developer or zone enterprise has failed to comply with the conditions prescribed for the additional benefits in question; and
- (ii) The BOA shall make the economic impact assessment of a SEZ within five years from the date the agreement is signed and within the first year of the operation of an enterprise.

(3) Any additional benefits granted by the BOA-

- (i) shall be deemed to be included in the relevant Developer Agreement; and
- (ii) shall become effective on such conditions as the BOA may stipulate.

(4) Nothing in this Act shall be construed to limit the authority of any Federal, Provincial or Local Government authority to grant such additional benefits to developers and zone enterprises as are within the scope of their respective statutory powers.

¹ Omitted through Special Economic Zones (Amendments) Ordinance, 2015

35. Protection of benefits- (1) All incentives under this Act shall be additional to all incentives, benefits and protections which may be applicable to developers and zone enterprises under generally applicable legislation and international agreements of Pakistan.

(2) These benefits shall not be withdrawn prematurely, and any change therein shall be to the advantage of the developer of the SEZ or the enterprise.

36. Benefits for developers.- Unless otherwise provided in a development agreement, developers shall be entitled to the following benefits, namely:-

- (a) one time exemption from all custom-duties and taxes on plant and machinery imported into Pakistan except the items listed under Chapter 87 of the Pakistan Customs Tariff, for the setting up of an SEZ subject to verification by the BOI; and¹
- (b) exemption from all taxes on income accruable in relation to the development and operation of the SEZ for a period of five years, starting from the date of signing of the development agreement².

37. Benefits for zone enterprises.- All zone enterprises shall be entitled to the following benefits, namely:-

- (a) one time exemption from custom-duties and taxes on import of plant and machinery into SEZ except items listed under Chapter 87 of the Pakistan Customs Tariff, for installation in that zone enterprise subject to verification by the BOI; and³
- (b) exemption from all taxes on income for enterprises commencing commercial production by the thirtieth June, 2020, in the SEZs for the next ten years;

“provided that exemption from all taxes on income for those zone enterprises or firms which commence commercial production after the aforesaid date shall be for the next five years”⁴.

¹ Substituted through Special Economic Zones (Amendment) Ordinance, 2015

² for the word “Exemption” occurring in the beginning, the word “exemption” and for the word “ten” the word “five” substituted through Special Economic Zones (Amendment) Ordinance, 2015

³ Section 37, Clause (a) substituted through Special Economic Zones (Amendment) Ordinance, 2015

⁴ Section 37, Clause (b) substituted through Special Economic Zones (Amendment) Ordinance, 2015

38. Jurisdiction of court.- Without prejudice to the provisions of section 39,-

- (a) the High Court of the Province in which a SEZ is located shall have exclusive original civil jurisdiction with respect to all disputes between the developer of that SEZ and any governmental authority or agency, to the extent that such dispute arises out of, or relates to, a developer agreement; and
- (b) the district court of the district within whose boundaries a SEZ is located shall have exclusive original civil jurisdiction with respect to-
 - (i) all disputes between the developer of that SEZ and a zone enterprise located within that SEZ; and
 - (ii) all disputes between two or more zone enterprises located within that same SEZ.

39. Alternative dispute resolution procedures.- (1) Development agreements may provide for the resolution of disputes through arbitration between developers and any Federal, Provincial or Local Governmental authority or agency arising out of, or relating to, such development agreement.

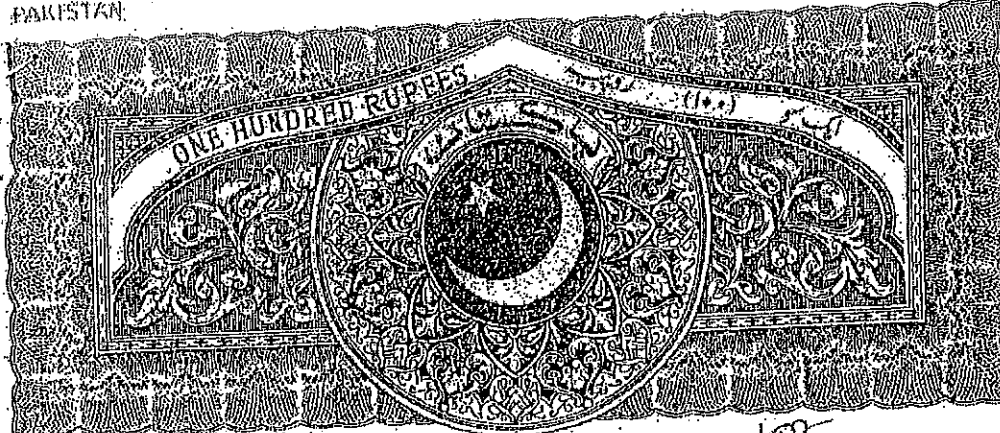
(2) Development agreements may authorize developers to pursue and defend the rights of zone enterprises within a particular special economic zone through arbitration.

(3) Zone regulations may provide for the resolution of disputes between zone enterprises in the same SEZ or between zone enterprises and developers through arbitration and mediation in accordance with procedures approved by the BOA for this purpose.

40. Rules and regulations for implementation of this Act.-The BOI, in consultation with SEZ Authorities and with approval of the BOA, may make rules and regulations as deemed necessary for implementation and to carry out purposes of this Act.

KARAMAT HUSSAIN NIAZI,
Secretary,

**Copy of Gas Supply Agreement
(NOC/Side Agreement included)**



MUHAMMAD SHAHID KHAN Stamp Vendor

Plot No. 10, Phase 1, D-11, Johar Park, Karachi

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Plot No. 10, Phase 1, D-11, Johar Park, Karachi

15 AUG 2009

Technical Copy

CONTRACT FOR THE SUPPLY OF GAS FOR POWER GENERATION

By this Contract made between Sui Southern Gas Company Limited (hereinafter referred to as "Company") and M/s. National Industrial Parks Development and Management Company (hereinafter called the "Consumer"). The Consumer agrees to purchase from the Company and the Company agrees to supply to the Consumer Natural Gas of 9.7 MMCFD at the Korangi Creek Industrial Park Karachi for Power Generation for his own use on the said plots on terms and conditions hereafter set forth:

TERMS AND CONDITIONS:

1. Gas supply will be provided by the Company on "as and when available" basis only during the period March to November each year. The Consumer will make dual fire arrangements to avoid loss of production as and when Gas is not available during March to November and also during December to February when the Company will keep the consumer's Gas supply disconnected at his cost, each year.

2. The Company shall supply Gas for power generation against unconditional UNDERTAKING by the Consumer that power so generated will be used only at the above mentioned premises of the Consumer will be for his own industrial activity and will not be to any other party. In the event of violation of this condition, Gas supply will be disconnected without notice and entirely at the risk and cost of the Consumer.

3.01 Immediately before execution of the Contract by the Consumer, the Consumer shall pay to the Company the Gas Supply Deposit or shall furnish a schedule Bank's continuing guarantee in lieu thereof to be drawn in accordance with the draft to be provided by the Company for due performance of his obligations hereunder.

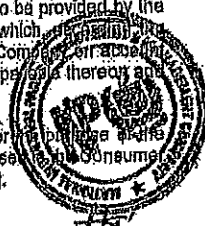
3.02 If subsequent to the execution of this Contract by the Consumer and the Company:

3.02.01 The consumption of Gas and/or connected load increases for any reason whatsoever beyond the limit of the above Gas supply deposit or Gas consumption otherwise increased beyond the normal consumption of the existing equipment.

3.02.02 Or the price of Gas or rent for meter shall be increased in accordance with the terms of this Contract.

3.02.03 Or any new tax or charge shall be levied on Gas by any Government or local or any other authority or any such tax or charge already levied on Gas shall be increased then in addition to the sum mentioned in sub-clause 3.01 above, the Company shall have a right to demand from the Consumer and the Consumer shall on such demand pay to the Company such amount in cash or furnish additional continuing bank guarantee in lieu thereof according to the draft to be provided by the Company within one month of the Company's demand. Provided the total amount of Gas supply deposit or bank guarantee in lieu thereof required to be provided by the Consumer under Sub-Clauses 3.01 or 3.02 of this Contract shall not exceed the amount which the Company may from time to time make the Consumer may have to pay to the Company or amount of estimated consumption of Gas together in three months together with taxes and charges payable thereon and three months rent for the meter.

3.02.04 The Company may utilize such Gas supply deposit received from the Consumer for the business of the Company, subject to condition that such Gas supply deposit shall be reimbursed to the Consumer upon disconnection of Gas supply under the terms and conditions of the Gas Supply Contract.



4.01 Subject to the provisions hereinafter made the Consumer shall pay to the Company price for Gas supplied to the Consumer at the rate fixed by the Ministry of Petroleum and Natural Resources, Government of Pakistan in due course, pending which Power Tariff as notified by the Government from time to time will be applicable on ad-hoc basis subject to retrospective adjustment after final decision.

4.02 The Consumer shall also pay to the Company rent of the meter at the rate prescribed by the Company from time to time from the date on which the meter is fixed up to the date when the same shall be removed provided that if the quantity of Gas consumption necessitates replacement of meter by a meter of different size. The Consumer shall pay rent of the new meter at the rate prescribed by the Company for such meter.

4.03 In addition to the price of Gas the consumer shall also pay to the company all taxes or charges levied on natural Gas by the government or local or other authority.

4.04 The register of the meter shall be prima facie evidence of the quantity of Gas consumed by the Consumer but should the accuracy of the meter be disputed and the meter be officially tested by the Company and be found to register erroneously, the register of the meter shall be rectified according to the degree of inaccuracy detected on such testing for the period meter has registered inaccurately. If such period is known or ascertainable and if such period is not known or ascertainable then the period of adjustment in the register of the meter and of Gas bills shall be from the date when the meter reading was last obtained.

4.05 In case the meter shall for any cause whatsoever, cease or omit to register regularly the quantity of Gas used, the Consumer shall pay to the Company for the Gas supplied to him during the period the meter so remained out of order on the basis of average monthly consumption of Gas by the Consumer during the two months immediately preceding or following the month in which the meter so remained out of order whichever is more.

4.06 In case meter cannot be read due to any reason the Company shall submit provisional bill based on the average of past two months consumption or any other reasonable basis as the Company may deem fit and the Consumer shall make payment against that bill within due date. The Company shall adjust the estimated consumption against actual reading obtained subsequently and bill the Consumer for the difference. Consumer shall make payment against such bill within due date.

5.01 Where the metering pressure exceeds 8 inches water column above atmospheric pressure, the unit of volumetric measurement shall be one cubic foot of Gas at an absolute pressure of 14.65 pounds per square inch and a temperature of 60 degrees Fahrenheit without application of adjustment for water vapor content and correction factors such as for pressure, temperature, specific gravity, deviation from Boyle's Law expansion and Reynolds number. The value of atmospheric pressure for calculating the pressure factor shall be 14.65 pounds per square inch and value of acceleration due to gravity shall be 32.17 feet per second. The gas delivered hereunder shall be measured in accordance with methods in use in the industry generally and recommended by the Gas Measurement Committee of the Natural Gas Department of the American Gas Association applied in practical manner subject to the approval of the Government of Pakistan.

5.02 Where the metering pressure does not exceed 8 inches water column above atmospheric pressure the unit of volumetric measurement shall be one cubic foot of Gas at metering pressure and temperature without adjustment for water vapor content.

BILLING

6.01 The bill will be sent periodically. This period may be one month to three months depending on the current policy of the Company in this respect. Any change in this policy will be at the sole discretion of the company but the Consumer will be duly notified at least 15 days in advance. Dispatch of bills by the Company by ordinary post at the address given hereinabove shall be considered sufficient evidence of delivery of the bills to the Consumer by the Company. It shall be the Consumer's liability to payment for the Gas consumed.

After the bills have been sent and for paid if the Company at any time discovers any omission or discrepancy in any such bill owing to any reason whatsoever, the Company shall be entitled to bring such discrepancy to the notice of the Consumer and send corrected bill. The Consumer undertake to pay within 15 days of the date of bill shown on the bills.



6.02

Any mistake in or dispute about the bill or meter reading shall not entitle Consumer to withhold payment of the bills in time, provided, however, if the Company finds any mistake in the bill sent to the Consumer then irrespective of the fact whether payment has been made or not, the Company shall, upon having discovered the mistake at any time be entitled to send a correct bill and Consumer shall be liable to pay the same.

PAYMENT

7.01

All bills pertaining to gas consumption and or other charges are payable within 15 days of the date of issue hereinafter referred to as "due date" as shown on the bills. The bills are to be paid at the authorized banks within the due date. The Consumer will not be entitled to extension in due date irrespective of the date of receipt of the bills by the Consumer.

7.02

The responsibility for making payment is that of the Consumer. If the first bill is not received by the Consumer within 45 days of commencement of Gas supply and thereafter if any bill is not received by the Consumer within 25 days after the due date of the previous bill the Consumer shall communicate with the Company and arrange for settlement of the dues. If the Consumer fails to pay any of the bills by the due date given hereon late payment surcharge at the rate prescribed by the Company for the time being shall become payable and shall continue to accrue at monthly rate until payment by the Consumer in full. The rate presently is 2% per month or part thereof. In addition to this surcharge, the Company shall also be entitled to terminate this Contract and to disconnect the supply of Gas and to remove its Gas meter and other equipment without any notice.

8.

Payment shall be made within the due date either by Cash or through a Bank Draft in favour of Sri Southern Gas Co Ltd at the authorized banks. Payment by cheque will not be considered payment unless it is realized. Failure of any cheque to be realized within 3 days from the date of deposit in the bank by the Company shall render the supply of Gas liable to disconnection without any notice.

9.

Payment must be made on or before the due date falling within which the supply of Gas is liable to be terminated without notice at the risk of the Consumer. Notwithstanding such disconnection / termination of Gas supply the Consumer shall pay the company the full amount of Gas bills up to and including the date of disconnection together with all charges, taxes and or incidental expenses accrued to or incurred by the Company.

GENERAL

10.

All pipes and fittings from the Gas main to the inlet of the meter station shall be laid and fixed by the Company.

The meter station shall be located close to the boundary wall within the Consumer's premises described hereinbefore and at a place nearest to the Company service connection. All pipes and fittings on and beyond the outlet of the meter station shall be installed by the Company at the expenses of the Consumer. The Company shall not be responsible for leakage of Gas from nor for repairs to such pipes or fittings under any circumstances.

The Gas meter, regulator service valve and the inlet pipe of meter forming parts of the meter station shall be installed and kept in repair by the Company.

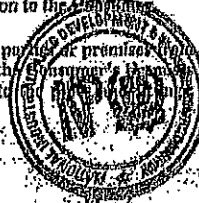
The Consumer shall be responsible for the safety and protection of the meter station and the said property of the Company and shall be liable for any damage caused thereto by fire or other accidents or due to carelessness of any one whatsoever not in the Company's employment. For this purpose if a meter room is constructed the Consumer shall be responsible for keeping it in good condition.

11.

The Company shall retain the title to and ownership of all regulators, meters, pipes, devices and other property installed by it upon the said premises and may remove or replace the same at any time before or after the termination of the Contract without prior intimation to the Consumer.

12.

The Company shall have the right to provide further connection to other premises from the outlet of the regulator installed for the purpose of supplying Gas to the Consumer's premises described above. In that case the cost of any alteration in or addition to the said premises and incidental thereto shall be borne by the Company.



13. No meter shall be connected to or disconnected from the Gas pipe except by the authorized personnel of the Company. The meter shall be inspected periodically, but the Company's personnel shall have free access at all reasonable times to Gas installations at the said premises of the Consumer.
14. Alterations in or additions to Gas installations will be made only by the Company but the Company may in exceptional cases exercise its discretion to permit the Consumer to undertake alterations in or additions to the Gas installations. Such permission must be obtained in writing from the Company in advance.
15. The Consumer shall not make maintain any connection with the fuel/Gas pipe of any other person or corporation during the subsistence of this Contract without the written consent of the Company.
16. As the production of Gas from wells and the conveyance of it are subject to accidents, interruptions and failures, and the lines and equipment to malfunctioning, breaking, freezing failures and closing, which cannot be foreseen or prevented by any reasonable care or expenditure and as the supply of Gas and transportation facilities are limited Company does not, by this Contract undertake to furnish to the Consumer a full and uninterrupted supply of Gas but only to furnish such supply and for such length of time as it reasonably can, and it is expressly agreed to by the Consumer that the Company shall not be liable for any loss, or damage, or injury that may result either directly or indirectly from shortages or interruptions in the supply of Gas or from discontinuance thereof due to the said reasons or as result of labour strikes, lockouts, riots, civil commotions, hostilities, wars, epidemics, calamities, natural disasters or causes beyond the ordinary reasonable control of the Company.
17. The Company shall have right to close or interrupt Gas supply to Consumer's premises for short periods after giving at least 24 hours notice in advance for carrying out necessary extension repair and/or alteration work in the Company's pipe lines, equipment and devices.
18. The Company shall have the right to curtail and/or to discontinue deliveries of Gas to the Consumer consuming Gas in excess of 3000 cu.ft. per hour whenever and to the extent necessary in its sole judgment for operational reasons.
19. The Consumer knowing its inflammable character shall take all precautions in the use of Gas and maintenance of Gas installation on his premises and shall be solely responsible for any loss, damages, injury or accident resulting directly or indirectly and for any reason whatsoever from Gas installation. The Consumer shall indemnify the Company against all demands and claims for any such loss, damage, injury or accident.
20. This Contract shall not be binding or in force until approved and signed by proper officer of the Company duly authorized in this behalf and no promise or agreement or representation made by any agent or employee in soliciting the same or otherwise, shall bind the Company except to the extent here-in provided.
21. Without prejudice to any other right that the Company may have and in addition to such right. The Company shall be entitled to rescind the Contract at any time for following reasons.
- 21.01. Neglected or default of the Consumer to pay the bills rendered by the Company for any months supply of Gas or other dues payable by the consumer within the period specified in clause 7.01 hereof and/or to meet the Company's demand for additional Gas supply deposit made under clause 3.02.03.
- 21.02. Any action by the Municipal Authorities, Improvement Trust, Local bodies, or any Government Authorities or any Legal Proceeding against the Company by any party interfering with the Company's right to supply Gas or collect dues payable to the Company hereunder.
- 21.03. Any action by the Consumer to secure Gas through the meter for purpose other than mentioned hereinabove or for another party without written consent of the Company.
- 21.04. Any action by the Consumer tending to secure more Gas than the meter registers to pass through the said meter at a higher pressure than that at which the regulator is set or any interference by the Consumer with the meters or regulators or the same from properly operating and correctly registering.



- 21.05 Any action of the Consumer to break the seal, or to tamper with the Gas installation, in any way whatsoever in order to receive unauthorized supply of Gas and or to indulge in unsafe usage of Gas.
- 21.06 Any alteration, addition or extension to the existing Gas installation carried out by the Consumer without obtaining prior approval of the Company in writing.
- 21.07 Violation of or default in compliance with any stipulations and conditions of this contract.
22. Either of the parties hereto may, at his/her/their absolute will determine this Contract by one month notice of his/her/their intention to do so to be given in writing to the other party and this Contract shall remain in force until so determined. In the case of determination of this Contract under this clause no party shall be entitled to any damages or compensation for any loss or injury arising from such determination of this Contract.
23. In case the premises of Consumer mentioned above or the property thereon shall be attached or threatened with attachment in execution or in case of assignment, bankruptcy or any act of insolvency on the part of the Consumer the Contract shall at the option of the Company become null and void and the Company shall have the right to remove any or all of its property from the premises of the Consumer.
24. In case of cancellation or termination of the Contract for any cause whatsoever, all claims for Gas supplied and/or services rendered by the Company up to the date of disconnection of Gas supply shall become forthwith due and payable without notice from the Company and Consumer shall pay the same on demand. In case of default late payment surcharge shall be payable by the Consumer as provided in clause 7.02 above.
25. The price of Gas and or charges payable by the Consumer under this Contract shall also be subject to such charges as may be notified by the Government from time to time and the rates so notified by the Government shall take effect from the date fixed by the Government irrespective of the whether the same have been intimated or not, to the Consumer by the Company.
26. In the event of disconnection at the request of the Consumer or due to any default on his/her/their part a sum of Rs. 1,000/- subject to increase/decrease by the Government in this behalf as reconnection fee shall have to be paid by Consumer before the Gas supply is restored by the Company. Restoration of Gas supply shall in any case be subject to the availability of meter and to other necessary equipment.
27. All the above mentioned terms and conditions contained in this Contract have been read and understood by the Consumer and a copy of terms and conditions has been received by the Consumer and the Consumer undertakes and agrees to abide by all such terms and conditions in token whereof the Consumer has affixed his/her/their signature and seal hereunder.

Signed for and on behalf of
SUI SOUTHERN GAS COMPANY LTD

Zeeshan Ali
For MANAGING DIRECTOR



M. Zubair Habib
Signed by the Customer

Dated: Dec 09 '07

M/s. National Industrial Parks
Development & Management
Company Ltd.

M. Zubair Habib

Telephone: 021-99204048

Fax: 021-99204047

ANNEXURE 'A'

NOV-09 11:39 FROM S. S. G. SALES DEPT

TO: 99284047
Fax: 021 5704041

P. 01

Mr. M. Zubair Habib
Chief Executive
National Industrial Parks
Development and Management Company,
2nd Floor, Block 2,
Finance & Trade Centre, Shah-rah-e-Faisal,
Karachi.

Dear Sir,

Subject: Side Letter Agreement to the Gas Supply Contract

Reference is made to your letter dated 11 September 2009 bearing reference no CS/KOIP (u) /158/09 and to the subsequent meetings regarding incorporation of either of the two options in the Gas Supply Contract which was forwarded through your above referred letter.

Please note that the provisions of the Gas Supply Contract between Sul Southern Gas Company Limited (SSGC) and National Industrial Parks (NIP) the provisions of which have been approved by the Oil and Gas Regulatory Authority (OGRA) does not envisage any assignment of the rights and obligations there under to a third Party nor does it permit novation of the Gas Supply Contract. However, we are pleased to offer to accept your request to allow NIP to undertake this power plant project through a Special Purpose Vehicle / Joint Venture Company on Build Own Operate (BOO) basis.

This Side Letter will become part of the Gas Supply Contract and will evidence our further agreement with respect to the matter set forth below:

Sul Southern Gas Company Limited acknowledges that NIP intends to undertake the Power Plant Project through a Special Purpose Vehicle / Joint Venture Company to be established with selected partner(s) on Build Own Operate (BOO) basis.

Sul Southern Gas Company Limited will have no objection to later accepting the Special Purpose Vehicle / Joint Venture Company in Lieu of NIP as the subsequent Consumer for purposes of the Gas Supply Contract upon the terms and conditions as applicable at the time of execution of the contract, subject to appropriate documentation with SSGC at the relevant time.

If the foregoing correctly sets forth your understanding of our contract with respect to the matter addressed above, please indicate your acceptance and approval below.

For and behalf of
Sul Southern Gas Company Limited

Name: Karlus Alvi
Designation: GM (Sales)

Accepted and Agreed on this 18th day of November 2009.

For and on behalf of National Industrial Parks

Name: M. Zubair Habib
Designation: CEO





**FEASIBILITY REPORT
OF
GAS FIRED COMBINED CYCLE POWER
PROJECT
AT
KORANGI CREEK INDUSTRIAL PARK (KCIP)
OF
NATIONAL INDUSTRIAL PARK (NIP)
PRIVATE LIMITED**

***MINISTRY OF INDUSTRIES & PRODUCTION
GOVERNMENT OF PAKISTAN***



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EXECUTIVE SUMMARY

- A. NIP has been established as a special initiative of the Ministry of Industries, Production and Special Initiatives, Government of Pakistan (the "GOP") to, inter alia, support industrialization in the country by establishing new industrial parks and rehabilitate those that may be handed over by the Government and to undertake related functions;
- B. NIP on April 13, 2010 issued a "Request for Proposals" ("RFP") to various companies to submit proposals for the installation and commissioning of a power plant of up to 48 MW as a captive power plant at the Korangi Creek industrial Park, Karachi for primarily supplying energy to the industrial users situated within the estate being developed by NIP in Korangi as the primary power purchaser (the "Primary Power Purchasers"), and thereafter supplying any energy remaining surplus after the requirements of the Primary Power Purchaser have been met to Bulk Power Consumers (as hereinafter defined) by NIP as the secondary power purchaser ("Secondary Power Purchaser") under specific power purchase agreements, which proposals would be evaluated and selected on the basis of acceptable proposals offering the lowest tariffs;

The Concessionaire (PSPL) submitted to NIP a proposal for the design, engineering, construction, insuring, commissioning, operation and maintenance, as required and instructed by NIP, of a gas-fired electric generation facility of up to 48 MW (the "Plant", as hereinafter defined) to be located at Korangi Creek Industrial Park, Karachi, Pakistan and for the subsequent supply of energy to the Primary Power Purchaser at the tariff indicated in the Bid as amended and revised following discussions between NIP and the Concessionaire.

- C. Simultaneously, NIP evaluated the Proposals/ Bid submitted in response to the Request for Proposals, including the Concessionaire's proposal / Bid, and has determined that the Concessionaire's proposal / Bid is technically acceptable and that its tariff proposal is among the lowest acceptable tariffs, and, as a result, , upon the delivery by the Concessionaire of the Bid Security (as hereinafter defined), NIP issued to the Concessionaire a Letter of Interest (as hereinafter defined) for the design, engineering, construction, insuring , commissioning, operation and maintenance of the Plant for such period as specified in this Agreement (the "Project", as hereinafter defined);



SCOPE OF THE PROJECT

The scope of the project (the "Scope of the Project") shall mean and include during the Concession Period:

(a) The Concession shall design, build, construct, install, commission, operate, manage and maintain the Plant in accordance with the drawings, designs and technical specifications indicated by NIP during the Concession Period or such extended periods as may be approved by NIP and following COD, shall supply energy to the Primary Power Purchasers during the Concession Period, provided that any surplus energy remaining after meeting the requirements of the Primary Power Purchases may be supplied to the Secondary Power Purchaser(s) during the Concession Period subject to compliance with all Applicable laws. Billing in respect of the electric power supplied by the concessionaire to the Primary Power Purchasers and/or the Secondary Power Purchaser(s) shall be carried out directly by NIP based on usage details provided by the Concessionaire and in accordance with the Tariff submitted by the Concessionaire in the Bid. The bills / invoices raised by the Concessionaire shall not be permitted to, under any circumstances, bill the Power Purchaser(s) directly other than where specifically instructed in writing by NIP. Following expiry of the Concession Period, the Concessionaire shall dismantle and remove, at his own costs, the Plant and Assets from the Project Site and hand over peaceful possession of the Project Site to the Concessionaire in accordance with Article 16 of the Concession Agreement. Alternatively, NIP shall have the option to purchase the Plant and the Assets for a value determined in accordance with Article 15 of the Concession Agreement

Modular Implementation of the Project

(a) Notwithstanding anything contained in clause 2.2.1, the Concessionaire will be entitled, where so requested by NIP, to design, build, construct, install and commission the plant to Modules provided that the Concessionaire shall ensure that (a) at all times the aggregate net capacity of the Modules shall be sufficient to meet the energy requirements of the Primary Power Purchasers, (b) the Plant shall meet such minimum plant capacity requirements as may be notified by NIP.

(b) Where NIP requires the concessionaire to design, build, construct, install and commission the Plant in Modules, it will notify the Concessionaire shall, within a period of three (3) days provide to NIP details as to the time required by the Concessionaire to set up such additional load along with all such other information as may be requested by the NIP. The Parties will have a period of thirty (3) days to discuss specific details in respect of the additional load requirement request of NIP and construction for the Module to meet such



additional load requirement will begin immediately upon the expiry of the thirty (30) days discussion period.

For the avoidance of any doubt, the Concessionaire is under an obligation to design, build, construct, install and commission the Plant up to a minimum capacity of 48 MW and any failure on the part of the Concessionaire to initiate the designing, construction, installation and / or commissioning of any Module in accordance with the instructions of NIP shall amount to a Concessionaire Event of Default.

Gas Arrangement

NIP has agreed to provide Gas to the Concessionaire as and when the same is available. Where, however, supply of Gas is not available to NIP, the Concessionaire will be required to operate the Plant on alternate fuel and will be entitled to charge a tariff for sale of electric power based on the alternate fuel in such quantities as may be required, or instructed by Concessionaire, to ensure that continuity of the Plant operations are not affected, hindered or interrupted.

FINANCING

Assignment and Creation of Security

The Concessionaire may with the prior consent of the NIP create a charge or encumber in favor of the Lenders any benefit, title and interest that it has in the Plant and the Assets constructed by the Concessionaire for the purposes of enabling financing of the project and for securing the repayment of the monies which may become payable by the Concessionaire to the Lenders, provided that such charge shall not be for a period beyond the Concession Period. For avoidance of doubt it is clarified that, creation of such charge or encumbrance in the plant and the Assets by the Concessionaire shall not in any way release and absolve the Concessionaire from the obligation under the concession Agreement and any liability arising out of such Encumbrance/lien shall be solely borne by the Concessionaire.

PROJECT SYNOPSIS

PROJECT NAME	48MW COMBINED CYCLE POWER PLANT KCIP
PROJECT SPONSOR	NATIONAL INDUSTRIAL PARK (NIP)
SPV NAME	POWER STATION PVT LTD. (PSPL)
GAS TURBINE MODEL	6 x KAWASAKI-M7 GPB80
STEAM TURBINE MAKE	3 x MANTURBO DIESEL



NO OF BLOCK	03
CONFIGURATION	2GT's + 1 ST (TOTAL 6 GT's + 3 ST'S)
TOTAL INSTALLED CAPACITY (GROSS ISO)	60,240 kW
TOTAL INSTALLED CAPACITY (GROSS MSC)	53,406 kW
Parasitic load	2406 kW
Power Available for 100 % load factor	51000 kW
For 95% load factor (used for tariff)	48400 kW
ANNUAL GENERATION NET AT MSC	
<i>(Based on 360 days, 24 hours per day operation</i>	
<i>@ 93% load factor And adjustment for auxiliaries)</i>	388,905,351 kWh
Net guaranteed efficiency under PPA	45%
PLANT COMPLETION TIME LINES	3 PHASES
1 ST PHASE	1 X GT (7530 KW GROSS ISO)
2 ND PHASE	1 X GT's + 1 X ST (12532 KW GROSS AT ISO)
3 RD PHASE	4 X GT's + 2 X ST (40124 KW GROSS AT ISO)
CAPEX	USD 70,589 million
Debt (80%)	USD 56.48 million
Equity (20%)	USD 14.12 million
Exchange Rate (as per Bid)	USD 1= Rs. 98
Levelized Tariff	US Cents 6.691/kWh
Fuel	Pipeline Quality Gas -930 Btu/scf
GAS AVAILABILITY	9.7 MMCFD
GSA STATUS	SIGNED (COPY ATTACHED)



EIA STUDY

(COPY ATTACHED)

October 8, 2010

NIP MAIN PROPOSAL
3 TRAINS 2 GTG's + 2 WHRB's + 1 STG
OPREATIVE COST AT 30 Deg AMBIENT AND DIFFERENT LOADS

S.No	Description	Units	100%	95%	90%	80%	70%	60%
1	Capacity Installed GPB-80 Power	kWe	38,400	36,400	34,560	30,720	26,880	23,040
2	Less GTG Parasitic Load		2,000	2,000	1,946	1,908	1,862	1,866
3	Net Power Available from GTGs		36,400	34,400	32,614	28,812	25,018	21,174
4	Steam Generated by WHRB 42bar/450°C	kg/hr	65,220	62,611	60,002	55,202	50,235	45,210
5	Power from STG	kW	15,006	14,400	13,800	12,656	12,554	10,398
6	Total Gross Power Generated (1+5)	kW	53,406	50,800	48,360	43,376	39,434	33,438
7	Less Parasitic Load	kW	2,406	2,400	2,352	2,305	2,097	1,908
8	NET POWER GENERATED/AVAILABLE (Sale-able Power)		51,000	48,400	46,008	41,071	37,337	31,530
9	No of GTGs Operating	No	6	6	6	6	6	6
10	Natural Gas Fuel Each GTG	m³/hr	2,206	2,128	2,051	1,907	1,774	1,650
11	Total Natural Gas Fuel (10 x 9)	m³/hr	13,236	12,768	12,306	11,442	10,644	9900



Sponsors Introduction & Project Team

Power Station (Pvt) Limited

Power Station (Pvt) Limited a Special Purpose Vehicle incorporated under Companies Ordinance 1984. The company is incorporated to undertake the development, financing, construction, operation and maintenance of Combined Cycle Power Plant at Korangi Creek Industrial Park (KCIP) developed by National Industrial Parks Management Company Limited , a company of Ministry of Industries & Production, GoP.

Power Station (Pvt) Limited is a subsidiary of IMS Engineering (Pvt) Limited, who have won the concession award by NIP to develop a combined Cycle Power Station at KCIP under the Concession Agreement.

Sponsors Introduction

IMS Engineering (Pvt.) Ltd was established as a registered partnership firm, in 1996, to undertake instrumentation & process management works. Pioneering innovations in fields of power generation, large scale engineering, fabrication, building management and sustainable solutions. IMS Engineering is consistent in delivery of quality solutions for governmental, commercial and industrial organizations has awarded us a reputation of being reliable partners to our clients.

IMS Engineering has been taking a leading role in providing general contracting services with uncompromised commitment to Quality, Health, Safety and Environment. We do this through the combination of an open relationship with our employees based on mutual trust, transparency, accountability and discipline.

Ultimate goal is ensuring continued precision in everything we do. Bering a vertically integrated engineering and Power Company, we are committed to provide the best economical and technical solutions for our valued customers.

We are proud of our achievements to date and we are committed to continually enhancing our capabilities to ensure we remain at the forefront of our industry both in terms of client and project needs.

Management Team

- **Mr. Mahmoud Ul Haq :** The Managing Director is assisted in day to day business by his son who joined the business in 1997 a few years back after completing his business studies in USA. Mr. Mahmoud is a forward looking individual with a vision of IMS Engineering as a single window Engineering EPC operator .



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- **Mr. Nisar Ahmad** : Director Projects Engineering Division at the Head Office in Karachi. He is a key resource and has a long standing with the Company. The projects all over the country report to him on technical matters.
 - **Mr. Faisal Abbasi** : Head of Finance Division. He consolidates the financial activity of the on-going projects in the country and keeps a track of budget. Preparing financial reports, follow up of account receivables and discussion with the senior management is done on monthly basis. He is the company's contact person with external auditors for smooth audit and timely preparation of annual accounts.
 - **Mr. Tariq Mahmood** : General Manager Projects of Power Generation. He is a long serving employee of the company and headed in the field of Power Generation for 14 years



Progress of Installed Generation Capacity in Pakistan

The table below shows the progress of installed capacities in Pakistan

PROGRESS OF INSTALLED GENERATING CAPACITY															
WAPDA, GENCOs & IPPs															
FISCAL YEAR ENDING 30th JUNE	WAPDA/PEPCO				Independent Power Producers (IPPs)								PAEC		TOTAL
	HYDRO	%age	THERMAL W/ GENCOs	%age	HYDRO	%age	THERMAL W/ GENCOs	%age	Wind	%age	Solar/Bi Mass	%age	Nuclear	%age	
Pre WAPDA	32	44%	67	56%											119
1960	253	69%	113	31%											366
1961	267	58%	197	42%											464
1962	267	58%	190	42%											457
1963	267	57%	202	43%											469
1964	267	41%	232	55%											599
1965	267	42%	369	58%											636
1966	267	42%	375	58%											642
1967	267	38%	441	62%											708
1968	567	50%	573	50%											1,140
1969	667	54%	667	46%											1,334
1970	667	50%	650	50%											1,317
1971	667	51%	650	49%											1,317
1972	667	51%	650	49%											1,317
1973	667	50%	654	50%											1,321
1974	867	54%	753	46%											1,620
1975	867	50%	873	50%											1,740
1976	867	45%	1,068	55%											1,935
1977	1,567	59%	1,068	41%											2,635
1978	1,567	59%	1,068	41%											2,635
1979	1,567	58%	1,118	42%											2,685
1980	1,567	58%	1,148	42%											2,685
1981	1,847	57%	1,407	43%											3,254
1982	1,847	57%	1,407	43%											3,254
1983	2,547	64%	1,407	36%											3,954
1984	2,547	64%	1,407	36%											3,954
1985	2,897	67%	1,442	33%											4,339
1986	2,897	59%	2,092	41%											4,989
1987	2,897	54%	2,452	46%											5,349
1988	2,897	52%	2,652	48%											5,549
1989	2,897	49%	3,052	51%											5,949
1990	2,897	45%	3,512	55%											6,409
1991	2,897	45%	4,126	59%											7,023



PROGRESS OF INSTALLED GENERATING CAPACITY

WAPDA, GENCOs & IPPs

FISCAL YEAR ENDING 30th	WAPDA/PEPCO				Independent Power Producers (IPPs)								PAEC		TOTAL
	Hydro	%age	THERMAL W/ GENCOs	%age	HYDRO	%age	THERMAL	%age	Wind	%age	Solar/Biogas	%age	Nuclear	%age	
1992	2897	41%	4134	55%											7031
1993	3329	46%	4361	54%											8122
1994	3725	49%	4976	51%											9151
1995	4825	46%	5738	54%											10563
1996	4825	44%	6238	56%											11063
1997	4825	37%	5070	39%			3061	24%							12956
1998	4825	35%	5070	37%			3788	28%							13683
1999	4825	35%	5070	37%			3905	28%							13800
2000	4825	33%	4874	34%			4748	33%							14444
2001	5009	32%	4740	31%	30	0.2%	5430	35%					325	2.0%	15534
2002	5009	32%	4740	30%	30	0.2%	5745	36%					325	2.1%	15819
2003	5009	32%	4740	30%	30	0.2%	5745	36%					325	2.1%	15819
2004	6463	37%	4834	28%	30	0.2%	5745	33%					325	1.9%	17367
2005	6463	37%	4834	28%	30	0.2%	5743	33%					325	1.9%	17395
2006	6463	37%	4834	28%	30	0.2%	5743	33%					325	1.9%	17395
2007	6444	37%	4834	28%	30	0.2%	5893	34%					325	1.9%	17526
2008	6444	35%	4899	27%	111	0.6%	6045	34%					325	1.8%	17827
2009	6444	36%	4900	27%	111	0.6%	6242	35%					325	1.8%	18022
2010	6444	34%	4829	26%	111	0.6%	7183	38%					325	1.7%	18392
2011	6516	34%	4829	23%	111	0.5%	8880	42%					650	3.1%	20986
2012	6516	32%	4841	24%	101	0.5%	8581	41%					650	3.2%	20499
2013	6733	32%	4841	23%	195	0.9%	8381	40%	50	0.20%			650	3.1%	20850
2014	6902	31%	5458	25%	195	0.8%	8703	40%	106	0.50%			650	2.9%	21104
2015	6902	30%	5788	26%	213	0.9%	8857	39%	179	0.80%	77	0.30%	650	2.9%	22666
2016	6902	30%	5788	25%	213	0.9%	8842	38%	306	1.30%	277	1.20%	650	2.8%	22978

Note:- Due to unbundling, WAPDA now represents Hydro capacity in the public sector.



Source: Electricity Marketing Data by Planning Power

NTDC EXPANSION PLAN 2018-2025:

Upcoming Generation Projects in FY 2017-18					
	Name of Project	Agency	Fuel	Installed capacity (MW)	Commission Date
1	LNG Based Plants at Balloki (GT No.1)	PPDB	Imp. LNG	400	Aug. 2017
2	LNG Based Plants at Balloki (GT No.2)	PPDB	Imp. LNG	400	Sep. 2017
3	Shahtaj Sugar Mills Ltd.	AEDB	Baggase	32	Nov. 2017
4	Hamza Sugar Mills Ltd.	AEDB	Baggase	30	Dec. 2017
5	Harrapa Solar Pvt. Ltd.	AEDB	Solar	18	Dec. 2017
6	AJ Power Pvt. Ltd.	AEDB	Solar	12	Dec. 2017
7	LNG Based Plants at Bhikki (1*ST)	PPDB	Imp. LNG	400	Dec. 2017
8	LNG Based Plants at Haveli Bahadur Shah (1*ST)	PPDB	Imp. LNG	430	Dec. 2017
9	LNG Based Plants at Balloki (1*ST)	PPDB	Imp. LNG	423	Dec. 2017
10	Port Qasim Power Project (Unit-I)	PPIB	Imp. Coal	660	Dec. 2017
11	Tarbela 4th Ext. Unit-I	WAPDA	Hydro	470	Dec. 2017
12	Golen Gol HPP Unit-I	WAPDA	Hydro	35	Dec. 2017
13	M/s Jhmapir Wind Power Ltd.	AEDB	Wind	49.6	Feb. 2018
14	M/s Hawa Energy Pvt. Ltd.	AEDB	Wind	50	Feb. 2018
15	Neelum Jhelum Hydro Unit-I	WAPDA	Hydro	242	Mar. 2018
16	Neelum Jhelum Hydro Unit-II	WAPDA	Hydro	242	Mar. 2018
17	Golen Gol HPP Unit-II	WAPDA	Hydro	35	Mar. 2018
18	Tarbela 4th Ext. Unit-II	WAPDA	Hydro	470	Apr. 2018
19	Neelum Jhelum Hydro Unit-III	WAPDA	Hydro	242	Apr. 2018
20	Neelum Jhelum Hydro Unit-IV	WAPDA	Hydro	242	Apr. 2018
21	Tarbela 4th Ext. Unit-III	WAPDA	Hydro	470	May. 2018
22	Golen Gol HPP Unit-III	WAPDA	Hydro	35	May. 2018
23	RYK Energy Limited.	AEDB	Baggase	25	May. 2018
24	M/s Hartford Alternative Energy	AEDB	Wind	49.3	Jun. 2018



	(Pvt.) Limited				
25	Chanar Energy Limited	AEDB	Baggase	22	Jun. 2018
26	Port Qasim Power Project (Unit-II)	PPIB	Imp. Coal	660	Jun. 2018
	Total Generation FY 2017-2018			6143.9	



Upcoming Generation Projects in FY 2018-19					
	Name of Project	Agency	Fuel	Installed capacity MW	Commission Date
1	Two Star Industries Pvt Ltd.	AEDB	Baggase	48.9	Aug. 2018
2	M/s Three Gorges Second Wind Farm Pvt. Ltd.	AEDB	Wind	49.5	Sep. 2018
3	M/s Three Gorges Third Wind Farm Pvt. Ltd.	AEDB	Wind	49.5	Sep. 2018
4	M/s Tricon Boston (Pvt.) Limited (A)	AEDB	Wind	50	Sep. 2018
5	M/s Tricon Boston (Pvt.) Limited (B)	AEDB	Wind	50	Sep. 2018
6	M/s Tricon Boston (Pvt.) Limited (C)	AEDB	Wind	50	Sep. 2018
7	Hunza Power (Pvt.) Ltd.	AEDB	Baggase	49.8	Oct. 2018
8	Sheikhoo Power Ltd.	AEDB	Baggase	30	Nov. 2018
9	Indus Energy Limited.	AEDB	Baggase	31	Nov. 2018
10	M/s Zephyr Power Pvt. Ltd.	AEDB	Wind	50	Nov. 2018
11	Faran Power Ltd.	AEDB	Baggase	26.5	Nov. 2018
12	Etihad Power Generation Limited.	AEDB	Baggase	74.4	Dec. 2018
13	Safina Sugar Mills Ltd.	AEDB	Baggase	20	Dec. 2018
14	Ittefaq Power (Pvt.) Ltd.	AEDB	Baggase	31.2	Dec. 2018
15	Bahawalpur Energy Ltd.	AEDB	Baggase	31.2	Dec. 2018
16	Mirpurkhas Energy Ltd.	AEDB	Baggase	26	Dec. 2018
17	Mehran Energy Ltd.	AEDB	Baggase	26.5	Dec. 2018
18	Kashmir Power Private Ltd	AEDB	Baggase	40	Dec. 2018
19	Alman Seyyam (Pvt.) Ltd.	AEDB	Baggase	34.5	Dec. 2018
20	Engro Powergen Project (Unit-I)	PPIB	Dom. Coal	330	Dec. 2018
21	HUB Power Company Ltd. (Unit-I)	PPIB	Imp. Coal	660	Dec. 2018
22	Grange Holding	PPIB	Imp. Coal	163	Jan. 2019
23	Alliance Sugar Mills Ltd.	AEDB	Baggase	30	Mar. 2019
24	Solar Power Projects (QA Solar)	PPDB	Solar	600	Jun. 2019
25	Engro Powergen Project (Unit-II)	PPIB	Dom. Coal	330	Jun. 2019
	Total Generation Addition in 2018-19			2882	



Upcoming Generation Projects in FY 2019-20					
	Name of Project	Agency	Fuel	Installed capacity (MW)	Commission Date
1	HUB Power Company Ltd. (Unit-II)	PPIB	Imp. Coal	660	Aug. 2019
2	Gulpur Poonch river	PPIB	Hydro	102	Oct. 2019
3	Habib Sugar Mills Ltd.	AEDB	Baggase	27	Nov. 2019
4	Sadiqabad Power Pvt Ltd.	AEDB	Baggase	45	Nov. 2019
5	Gotki Power Pvt Ltd.	AEDB	Baggase	45	Nov. 2019
6	Wind Power Projects (Competitive Bidding)	AEDB	Wind	600	Mar. 2020
7	Solar Power Projects (Competitive Bidding)	AEDB	Solar	600	Mar. 2020
8	Shanghai Electric Power Project	PPIB	Dom. Coal	1,320	Jun. 2020
9	Thal NOVA , Thar Block-II	PPIB	Dom. Coal	330	Jun. 2020
10	Thar Energy Limited (HUBCO Ltd.) Thar Block-II	PPIB	Dom. Coal	330	Jun. 2020
Total Generation Addition in 2019-20				4,059	

Upcoming Generation Projects in FY 2021-22					
	Name of Project	Agency	Fuel	Installed capacity (MW)	Commission Date
1	Karachi Coastal (Unit-II)	PAEC	Nuclear	1,100	Oct. 2021
2	Oracle Coal Power Project	PPIB	Dom. Coal	1,320	Dec. 2021
3	Coal Based Power Plant at Gawadar	PPIB	Imp. Coal	300	Dec. 2021
4	Karot HPP	PPIB	Hydro	720	Dec. 2021
5	CASA	GoP	Import	1,000	Jun. 2022
6	Renewable	AEDB	Wind & Solar	300	Jun. 2022



	Total Generation Addition in 2020-21			4,740	
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Upcoming Generation Projects in FY 2022-23					
	Name of Project	Agency	Fuel	Installed capacity (MW)	Commission Date
1	Suki Kinari HPP	PPIB	Hydro	870	Dec. 2022
2	Dasu HPP (Phase-I)	WARDA	Hydro	2,160	Jun. 2023
3	Renewable	AEDB	Wind & Solar	500	Jun. 2023
	Total Generation Addition in 2022-23			3,530	

Upcoming Generation Projects in FY 2023-24					
	Name of Project	Agency	Fuel	Installed capacity (MW)	Commission Date
1	Asrit Kedam	PPIB	Hydro	215	Dec. 2023
2	Kohala HPP	PPIB	Hydro	1,124	Jun. 2024
3	Dasu HPP (Phase-II)	WAPDA	Hydro	3,260	Jun. 2024
4	Renewable		Wind & Solar	450	Jun. 2024
5	Chakothei-Hattian	PPIB	Hydro	500	Jun. 2024
	Total Generation Addition in 2023-24			5,549	

Upcoming Generation Projects in FY 2024-25					
	Name of Project	Agency	Fuel	Installed capacity MW	Commission Date
1	Azad Pattan HPP	PPIB	Hydro	640	Dec. 2024
2	Madian HPP	PPIB	Hydro	157	Dec. 2024
3	Kaigah Hydropower Project	PPIB	Hydro	548	Dec. 2024



4	CHASHNUPP-V	PAEC	Nuclear	1,100	Dec. 2024
5	Mahl Hydropower Project	PPIB	Hydro	590	Dec. 2024
6	Diamer Basha (Phase-I)	WAPDA	Hydro	2,250	Dec. 2024
7	Rajdhani Hydropower Project	PPIB	Hydro	132	Jun. 2025
8	Lower Spat Gah	WAPDA	Hydro	496	Jun. 2025
9	Lower Pallas Valley	WAPDA	Hydro	665	Jun. 2025
10	Renewable		Wind & Solar	900	Jun. 2025
Total Generation Addition in 2024-25				7,478	

Generation Expansion Plan – Summary	
Generation Addition	(MW)
Existing Capacity	24,704
Generation Addition in 2017-18	6,145
Generation Addition in 2018-19	2,882
Generation Addition in 2019-20	4,059
Generation Addition in 2020-21	5,448
Generation Addition in 2021-22	4,740
Generation Addition in 2022-23	3,530
Generation Addition in 2023-24	5,549
Generation Addition in 2024-25	7,478
Total Generation Addition from 2016-2025	40,794
Cumulative Generation in 2024-2025	59,092

Description of Project

The Project is designed for 48 MW industrial load of KCIP. However, it shall have an initial generation capacity of approximately 6.61 MW (resulting from installation of Kawasaki Gas turbine , GPB-8 having ISO capacity of 75310 KW and 6610 at 30C C) in 1st phase, where the gas turbine is working on simple cycle. This capacity will be increased to 48.233 MW Net at Mean Site Conditions in three different phases depending upon the requirement of NIP under Concession Agreement which states that the capacity addition is dependent upon the load requirements of the industrial units being developed at industrial Park.



PSPL sponsors ; IMS. who are the developers and contractors for the project shall design, build, construct, install, commission, operate, manage and maintain the Plant in accordance with the drawings, designs and technical specifications indicated by NIP during the Concession Period or such extended periods as may be approved by NIP and following COD, shall supply energy to the Primary Power Purchasers during the Concession Period, provided that any surplus energy remaining after meeting the requirements of the Primary Power Purchasers may be supplied to the Secondary Power Purchaser(s) during the Concession Period subject to compliance with all Applicable Laws. The nature of existing business is Expansion.

Technology Selection

Under the RFP floated by NIP to potential bidders, fuel availability was to be confirmed by NIP and the bidders were required to provide the most viable solution to supply 48 MW of electricity under the concession agreement. Gas turbines based power generation in combined cycle mode has been suggested by the sponsors on account of following reasons;

1. High efficiency – around 50% as compared to gas engines (45-47%)
2. Low variable cost per unit of electricity as compared to gas engines
3. Better availability -90% to 93% as compared to 88-90% for gas engines
4. Proven technology for this size of application

In addition to the above, the Gas turbine based technology is sound and secure as regards to environment as well as sound emissions etc and no hazards are foreseen for this application.

The application of proven technology with overall low cost provides an opportunity to the end consumer to procure , reliable and economical power at a comparatively lower rate than grid as is evident from the tariff calculations attached in annexure

Gas Supply Arrangement & Consumption

Under the Concession Agreement, arrangement of fuel is the responsibility of NIP , which in turn has signed a Gas Supply Agreement with SSGC to supply upto 9.6 MMSCFD gas to the project for power generation. Billing of gas would be made directly to NIP by SSGC and the gas price would be deducted from power bill as per actual

- Phase 1 – 1.6 MMSCFD – 6.07 MW (GTG) Gross MSC
- Phase 2 – 3.2 MMSCFD – 12,14 MW (GTG) + 4.8 MW (STG) Gross MSC
(considered for 95% load)
- Phase 3 – 9.7 MMSCFD – 36.42 MW (GTG) + 14.4 MW (STG) Gross MSC
(Considered for 95% load)



Installation Plan

Under the Concession Agreement, PSPL is obligated to develop up to 48 MW of the Contract Capacity of the power plant. For this purpose, Following installation plan is envisaged to ensure at least 48 MW capacity all the year round. This means some additional capacity would be needed to cover the schedule outages etc. However, under the Power Purchase Agreement payment to PSPL would be made only up to 48 MW, thus NIP or its end consumers would not be bearing any additional costs on account of unutilized capacity.

The following time lines are expected for installation of 48MW Power Plant depending upon the availability of load demand and after green signal from NIP management.

Phase	Gas Turbine (MW)	Steam Turbine (MW)	Power (ISO) (MW)	Total Power (MW) -MSC	Expected COD
1	7.53 MW	0	7.53	6.40	Under Testing
2	7.53	5.02	12.55	17.82	Dec 2022
3	30.12	15.06	60.24	53.406	Dec 2024

Major Components

The products that will be going to be manufactured for National Industrial Parks details are given below:

- GAS TURBINE GENERATOR – KAWASAKI
- FUEL GAS COMPRESSOR – HOWDEN
- PULSE CLEANER AIR FILTER – DONALDSON
- STEAM TURBINE – MANTURBO DIESEL
- WHRB's – DESCON/CLEAVER BROOKS

Components List

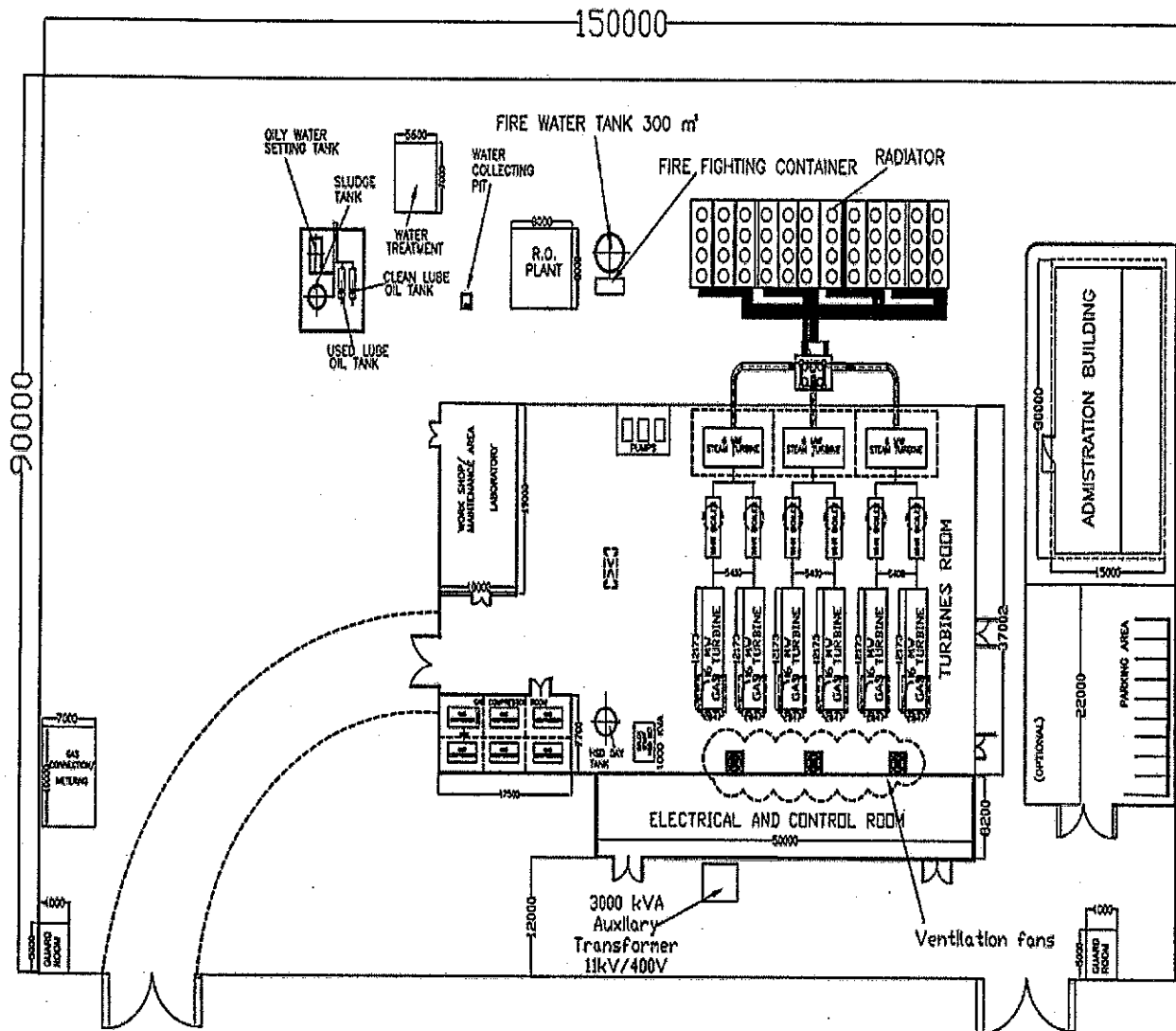
S.NO	Main Components	S.NO	Auxilairies /Accessories
1.	Gas Turbine Generator Set	1.	Auxiliary System
2.	Gas Turbine	2.	Starting System
3.	Main reduction gear box	3.	Fuel system (gas and liquid fuel)
4.	Alternator with AVR	4.	Lubrication system
5.	Coupling	5.	Ventilation System
6.	Acoustical enclosure	6.	Combustion Air Intake



7.	Maintenance Platform for Gas Turbine	7.	Pulse cleaning filters
8.	Waste Heat Recovery Boiler	8.	Fuel oil nozzle water purge system
9.	Exhaust Gas ducts	9.	Exhaust gas system
10.	Exhaust gas silencer	10.	Compressor water wash system
11.	Expansion joints	11.	GTG package firefighting system
12.	Boiler bypass damper system	12.	Spare parts for GT and alternator with 2 years
13.	Feed water control system	13.	Steam Turbine generator and air cooled condenser
14.	Boiler control panel	14.	Speed reduction gearbox to 1500 rpm
15.	Freestanding switchboard	15.	Coupling and guard non sparking
16.	Water level limiter	16.	Emergency stop valve with steam strainer
17.	Automotive blow down valves	17.	Multi type governor valves
18.	Duct mounted economizer	18.	Over speed governor devices with hand trip device
19.		19.	Governor assembly
20.		20.	Output couplings steam piping
21.		21.	Auxiliary lube oil pump with relief valve emergency oil pump with relief valve



Project Layout Plan

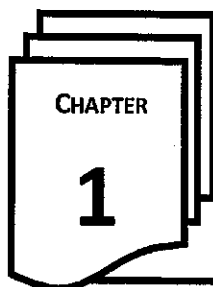




Annexures



Initial Environment Examination Report



INTRODUCTION

1.1 BACKGROUND INFORMATION

Study Type	Initial Environmental Examination (IEE)
Study Title	IEE for Power Station Pvt Limited
Location	Korangi Creek Industrial Park (KCIP)
Project Proponent	Power Station (Pvt) Limited, Sponsored by I&MS Engineering (Pvt) Limited
Project Consultant	Global Environmental Management Services (Pvt) Ltd. (GEMS)

An Initial Environmental Examination (IEE) was carried out by GEMS, for M/s Power Station Pvt Limited for their NG based 48 MW Power Generation facility to KCIP and different industries developing in the existing premises, Karachi as per legislative requirement under Sindh Environmental Protection Agency (SEPA) Act 2014. This IEE report is consolidation of the finding and assessment carried out during the entire IEE process. This IEE was guided by best international practices and conducted accordingly for Power Station Pvt Limited.

As stated earlier in the introductory paragraph this IEE study has been undertaken to conform to the requirements of the SEPA Act 2014; the Pakistan Initial Environmental Examination; Environmental Impact Assessment Review Regulations 2014. Furthermore, this IEE being an important social and environmental governance tool has gone beyond the legislative requirements. It has incorporated the international best practices, the company's social and environmental policies and compliance and contextual realities to integrate the philosophy and processes of sustainable development.

1.2 THE PROPONENT

I&MS Engineering (Pvt) Limited is an emerging engineering company, celebrating 21 years in providing complete engineering procurement construction and commissioning services in four different verticals . They also have a fifth vertical which generally is used in trading of goods and services. They are listed as C-2 contractor under Pakistan Engineering Council's category system and are registered in Securities and Exchange Commission of Pakistan as a limited liability company. They have paid up capital of 1 Billion (around USD10 Million) and have 300 employees spread over 3 regional and 1 international office. At I&MSE our focus is on building long term relationships. They boast of having 60% of their business via repeat business from existing clients.

They are recognized nationally and internationally, on diversified business solutions which are based on more than two and half decades of working with multinational, local, corporate and Government

institutions. Their technical team design, supply, commission and services different engineering solutions customized to their client's requirement.

1.3 CONSULTANT'S PROFILE



Global Environmental Management Services (Pvt.) Ltd. (GEMS) is an Environmental Consultancy which provides broad range of Environmental Solutions which are and not limited to Environmental Audits, Initial Environmental Examinations (IEE), Environmental Impact Assessments (EIA), Baseline studies and Training & Capacity building. GEMS is one of the few environmental firm having its own renowned ISO 17025 Certified Environmental Laboratory by the name of Global Environmental Laboratory (Pvt) Ltd.

GEMS have several divisions at work which provides core quality services. They are as follows:

1.3.1 Consultancy Division:

GEMS offer the following services to various industries, government institutions and international development organizations:

- Environmental impact assessments
- Environmental audits and management plans
- Baseline studies and habitat mapping
- Capacity building and trainings
- Cleaner production for industries

1.3.2 Laboratory Division:

GEMS Laboratory, Global Environmental Lab (Pvt.) Ltd. is the leading source of environmental solutions. It is providing 24 hours sampling and monitoring services to various sectors including:

- Liquid Effluent Analysis
- Drinking Water Analysis
- Soil and Sludge Analysis
- Microbiological Analysis
- Gaseous Emissions and Particulate Matter Analysis
- Ambient Air Monitoring
- Noise Level Measurements
- Light Intensity Measurements

- Complete Monitoring as per NEQS and SEQS

For over a decade GEMS have conducted ESIA's in an expanding range of Energy sector (oil and gas industry, power plants etc.), Manufacturing Industries (e.g. pharmaceutical, mineral fertilizers, textile, paper, food processing etc.), Infrastructure projects (roads, highway's buildings etc.), ports and harbors, tourism, aquaculture and fisheries.

1.4 IEE STUDY TEAM

GEMS personnel have professional environmental and social experience extending throughout Pakistan and UAE. They are all qualified environmental and social scientists with complementary multi-disciplinary skills covering all major biomes of the environment. As a result GEMS is able to offer accurate, independent and appropriate services to its clients and to regulatory bodies.

1.5 CATEGORIZATION OF THE PROPOSED PROJECT

The proposed project is subjected to the "under Schedule I, Category D" of SEPA Review of IEE and EIA Regulations, 2014 which defines that such kind of projects requires an IEE at planning stage.

- **Schedule I**
- **Other projects**

Any other project for which filing of an IEE is required by the Agency under sub-regulation (2) of Regulation 6.

1.6 PURPOSE OF THE STUDY

The purpose of this IEE study is to evaluate the proposed project activities against the Pakistan Environmental Assessment Procedures, Sindh Environmental Protection Agency Act, 2014 and SEQS etc.

The specific objectives of this IEE report is to:

- Assess the existing environmental conditions of the proposed project area, including identification of environmentally sensitive areas and receptors;
- Assess the various activities to identify their potential impacts on environment, evaluate these impacts, and determine their significance;
- Propose appropriate mitigation measures that can be incorporated in the project to minimize the damaging effects or to the negative environmental and social consequences if identified during the assessment;
- Assess the proposed activities and determine whether they comply with the relevant environmental regulations of Sindh-EPA;
- Prepare an IEE report for submission, to the Sindh-EPA.

1.7 SCOPE OF THE STUDY

For this IEE study, the scope of work is as under:

- Organization of physical, biological socioeconomic and cultural baseline of the proposed project area;
- Project impact identification, prediction, and significance based on project activities.
- Identification and assessment of the workability of mitigation measures to offset or minimize negative project impacts on environment.

1.8 APPROACH AND METHODOLOGY

This IEE was performed in five main phases which are described below.

1.8.1 Scoping

The key activities of this phase included:

- **Project Data Compilation:** A generic description of the proposed activities, within the project area relevant to environmental assessment, was compiled with the help of PEPA Guidelines¹.
- **Literature and Legislation Review:** Secondary data on weather, soil, water resources, and wildlife vegetation was reviewed and compiled and information on relevant legislation, regulations, guidelines, and standards was reviewed and compiled.
- **Identification of Potential Impacts:** The information collected in the previous steps was reviewed, and potential environmental issues were identified.

1.8.2 Baseline Studies

Following the scoping exercise, the project area was surveyed to collect primary data. During the field visits, information was collected on;

- Ecologically important areas
- Ambient air quality
- Surface and groundwater resources
- Existing infrastructure
- Local communities
- Public services
- Sites of archaeological or cultural importance.

¹ Guidelines for Preparation and Review of Environmental Reports (Government of Pakistan, 1997)

The following specific studies were conducted as part of the IEE.

Biodiversity Study: Biodiversity experts conducted the biodiversity study, which consisted of a thorough literature review and field data collection. As part of the floral and faunal study, random sampling was conducted and the area's floral and faunal species were documented. The diversity of avian, large and small mammals, and reptile species was determined. Information was collected on the species found in the area.

Physical Environment: Environmental Assessment Specialists conducted physical environmental study including, ambient air, noise, water sampling, surface water resources and the groundwater resources of the areas.

Socioeconomic Study: A Socioeconomic expert conducted socioeconomic and cultural study in the proposed project area. The study team through participatory technique collected data from the locals of the proposed project area. The profile included livelihood, culture, leadership, gender issues, spiritual and temporal leadership, demographic information based on field data and published sources, the existing use of land resources, community structure, employment, distribution of income, goods and services, public health, local religious and cultural values, and local customs, aspirations, and attitudes.

1.8.3 Impact Assessment

The environmental, socioeconomic and cultural, gender and project information collected in previous phases was used to assess the potential impacts of the proposed activities. These included potential project impacts on:

- Groundwater and surface water quality;
- Ambient air quality;
- Ecology of the area, including flora and fauna;
- Local communities.

Wherever possible and applicable, the discussion covers the following aspects:

- The present baseline conditions;
- The change in environmental parameters likely to be affected by project related activities;
- Identification of potential impacts;
- Likelihood and significance of potential impacts;
- Mitigation measures to reduce impacts to as low as possible;
- Prediction of impacts, including all long-term and short-term, direct and indirect, and beneficial and adverse impacts;

- Evaluation of the importance or significance of impacts (The significance of each impact has been judged on the basis of available local, national, and international standards. Where such standards were not available, the best practice elsewhere has been referred to);
 - Implementation of mitigation measures (i.e., environmental management);
 - Determination of residual impacts;
 - Identification of controls and monitoring of residual impacts.

1.8.4 Documentation

At the end of the examination, an IEE report was prepared according to the relevant guidelines. This report includes the findings of the assessment, project impacts, and mitigation measures to be implemented during the execution of the proposed activities.

Components of this Report are:

Chapter: 1	Introduction
Chapter: 2	Project Description
Chapter: 3	Institutional, Legislation and policy framework
Chapter: 4	Physical Environment
Chapter: 5	Ecological Environment
Chapter: 6	Socio-Economic and Cultural Environment
Chapter: 7	Environmental Impacts & Mitigation
Chapter: 8	Environmental Monitoring and Management Plan
Chapter: 9	Conclusion

CHAPTER 2

PROJECT DESCRIPTION

2.1 BACKGROUND INFORMATION

This section presents a detailed project description related to the proposed power Generation facility. A detailed insight regarding the project description was established by reconnaissance survey, site visit, and detailed discussions between project proponent and GEMS team. The proposed project will be establish with in the premises of Korangi Creek Industrial Park (KCIP).

2.2 PROPONENT ADDRESS & LOCATION MAP

The proposed site has been allotted in existing industrial premises located at Plot No..... Korangi Creek Industrial Park, Korangi Creek Cantonment Karachi, Pakistan. Location map & layout are presented as Exhibit 2.1. & Exhibit 2.2 (a) & Exhibit 2.2 (b) respectively.

Exhibit 2.1 Location map

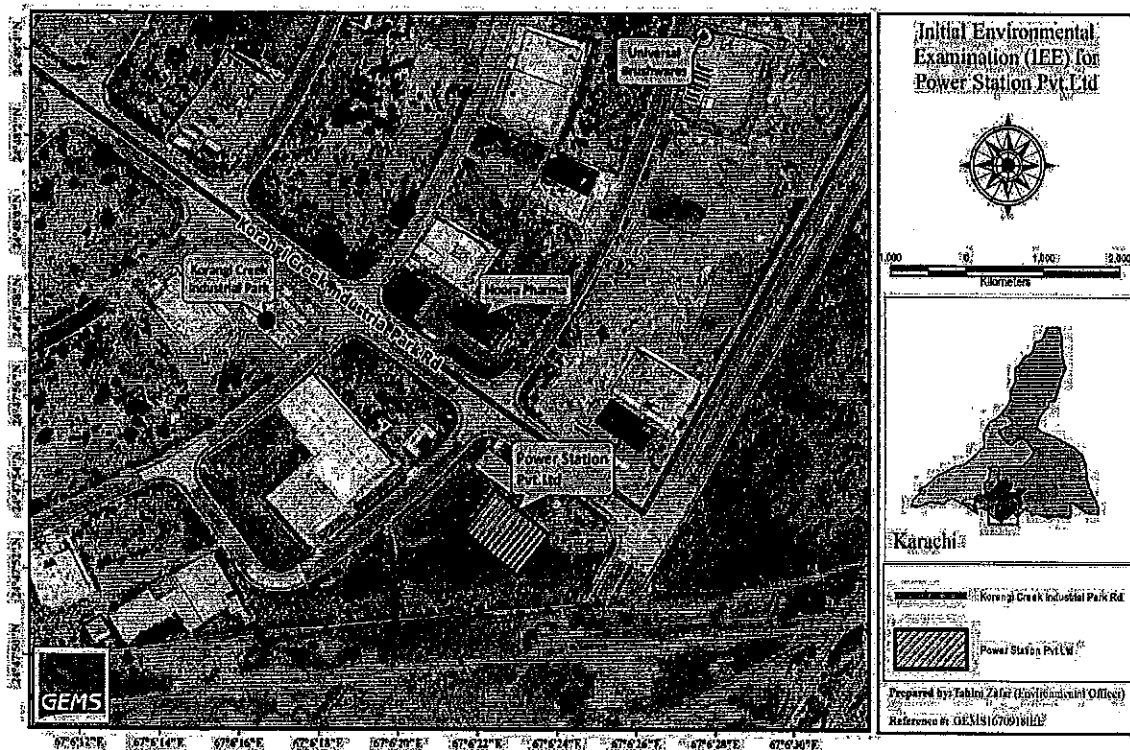
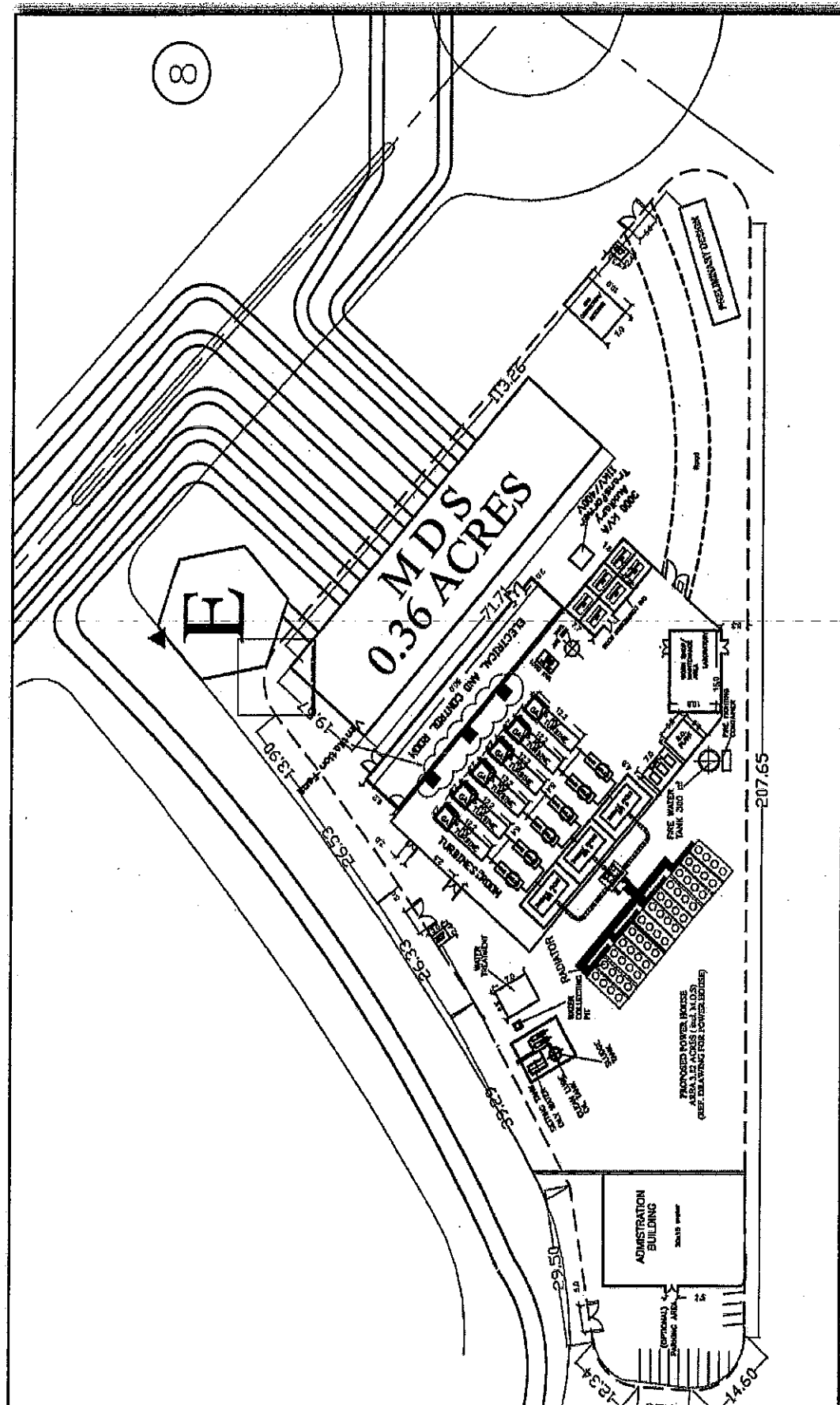
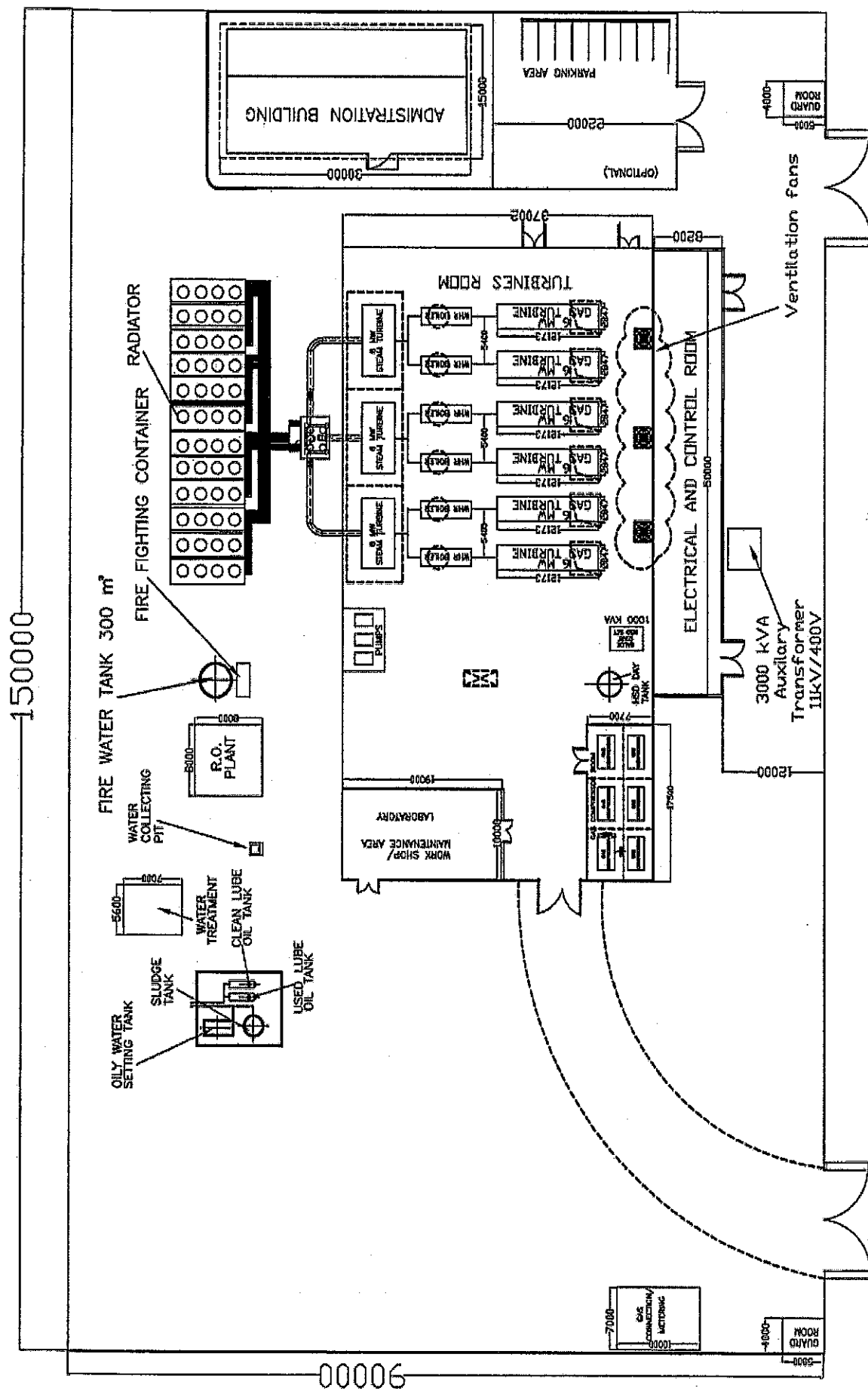


Exhibit 2.2. Layout map





2.3 JUSTIFICATION OF SITE SELECTION

Proposed project site has been allotted in existing industrial premises of Korangi Creek Industrial Park (KCIP). Site selection was guided by many factors like infrastructure, availability of land, water sources, fuel transportation, power availability etc. Specific site selection criteria for the proposed project are given below;

- Total plot area acquired by the facility is 12 Acre.
- Korangi Creek Industrial Park is the well-developed industrial area comprises of more than 80 industries, which are mainly pharmaceutical, chemical, cement industries etc. and having all basic infrastructure facilities like availability of water supply, natural gas, electricity, transport, telecommunication systems etc.
- There is no protected area notified under the Wild Life (Protection) Act (1972) & Eco-sensitive area notified under Section 3 of the Environment (Protection) Act 1997 exists within 10 Km radius areas from the project Site.
- Availability of trained and skilled manpower nearby because of the proximity to various industrial areas and city/town.

2.3.1 Power Generation Mechanism

The proponent is involved in the production of Electricity of about 53.406 MW Gross at Mean Site Conditions and gross ISO capacity of 60.24 MW resulting into an output of 48.233 MW based on 95% availability per annum and supply to various companies allocated in the exiting premises of National Industrial Park. The generated power from the Power Station will be supplied to different industries established and developed in National Industrial Park, Karachi. The project will supply to the industrial units at Kornagi Creek Industrial Park (KCIP) developed by National Industrial Parks Management Company (Pvt), Ministry of Industries & Production, and Government of Pakistan.

The proposed power generation plant shall be a Gas Turbine based combined cycle plant, consisting of:

- 3 sets, each set shall comprise of:
 - 2 units Gas Turbine Plant 6,400 kWe at 30 Deg C
 - With gas and liquid dual fuel capability
 - 2 units waste heat recovery boiler
 - capacity each 10,000 – 11,000 Kg/Hr
 - at 400/450 Deg C superheated steam
 - 40-45 bar
- 1 unit steam turbine plant 4800 kWe at MSC
- 11,000 volt switch gear

- Fuel gas compressor and all required accessories.

2.3.2 DESIGN SPECIFICATION

Performance	Electric output	6,070 kwe at 30 deg c (gas)
	Voltage	11 kilo volts
	Frequency	50 hz
Fuel specification ▪ Gas fuel	Natural gas	
	Lhv	8,000 kcal/nm ³
	Density	0.7974 kg/nm ³
	Supply pressure	3 psig
	Supply temperature	10 deg c above dew point
▪ Liquid fuel	Light fuel oil	
	Lhv	10,250 kcal/kg
	Density	0.83 kg/lit
	Supply temp	ambient

Scope of Supply

S.NO		S.NO	
1.	Gas Turbine Generator Set	1.	Auxiliary System
2.	Gas Turbine	2.	Starting System
3.	Main reduction gear box	3.	Fuel system (gas and liquid fuel)
4.	Alternator with AVR	4.	Lubrication system
5.	Coupling	5.	Ventilation System
6.	Acoustical enclosure	6.	Combustion Air Intake
7.	Maintenance Platform for Gas Turbine	7.	Pulse cleaning filters
8.	Waste Heat Recovery Boiler	8.	Fuel oil nozzle water purge system
9.	Exhaust Gas ducts	9.	Exhaust gas system
10.	Exhaust gas silencer	10.	Compressor water wash system
11.	Expansion joints	11.	GTG package firefighting system
12.	Boiler bypass damper system	12.	Spare parts for GT and alternator with 2 years
13.	Feed water control system	13.	Steam Turbine generator and air cooled condenser
14.	Boiler control panel	14.	Speed reduction gearbox to 1500 rpm
15.	Freestanding switchboard	15.	Coupling and guard non sparking
16.	Water level limiter	16.	Emergency stop valve with steam strainer

17.	Automotive blow down valves	17.	Multi type governor valves
18.	Duct mounted economizer	18.	Over speed governor devices with hand trip device
19.		19.	Governor assembly
20.		20.	Output couplings steam piping
21.		21.	Auxiliary lube oil pump with relief valve emergency oil pump with relief valve

Configuration	6 x Gas Turbine Generators 6 x Waste Heat Recovery Boilers 3 x Steam Turbine Generators
Prime Mover	Kawasaki Gas Turbine Generator GBP-80
Fuel Gas Compressor	Howden – Austcold
Waste Heat Recovery Boiler	Cleaver Brookes S.C. Engineering
Steam Turbine Generator	ENGECROL – Moditech
Air Cooled Steam Condenser	6 Cells x 36 bundles DESCON
Pulse Cleaning Filter	Donaldson - Clarcor
Black Start Diesel Generator	Cummins Caterpillar

2.4 RESOURCE REQUIREMENTS

The proposed project requires additional water, power, fuel, human resources, machineries & utilities etc. The details of all major resources required for proposed project are described in subsequent sections under respective headings.

2.4.1 Man Power

The manpower is one of the main resource requirements to operate and maintain the plant in a better and efficient way. Total 150 personnel will be required during construction phase while during operation phase the company has planned to employ about 75 personnel at various departments.

2.4.2 Gas

During operation phase 261 MMCFT/month natural Gas will be utilized which will be sourced from SSGC.

2.5 Fire Management

The Proponent has developed a comprehensive emergency response plan in order to deal with various types of emergencies. However, installation of firefighting system has also been included in the construction phase.

2.6 Policies

2.6.1 Environmental Policy

Ref. EP-9501/ R-0608/04

Helping to create a better world through eco-friendly solutions, is the environment policy that I&MS Engineering (Pvt) Ltd has kept in forefront ". We have a responsibility and the spirit to fulfill the commitment to environmental protection.

We intend to:

- Take appropriate precautions to avoid environmental hazards and to prevent damage to the environment.
- Ensure that our environmental policy is implemented effectively by applying appropriate management systems. The technical and organizational procedures required to do this are monitored regularly and constantly further developed.
- Ensure sustainable development in environmental protection by careful use of natural resources. It is our aim to avoid pollution or to reduce it to a minimum, above and beyond statutory requirements.
- Work continually, toward reducing the burden on the environment, toward minimizing associated risks and toward lowering the use of energy and resources, above and beyond the legal requirements.
- Assess and incorporate the potential impact on the environment in product and process planning at the earliest possible stage.
- Require each employee to act in an environmentally conscious manner. It is the constant duty of management to increase and encourage awareness of responsibility at all levels.

2.6.2 Health and Safety Policy

Ref. HSP-9501/ R-0608/01

- I&MS Engineering (Pvt) Ltd is committed to quality in all of our policies, workplace environment and business practices, concerning the environment, health and safety.
- We strive to be global citizens in the communities in which we operate, and to provide a safe, healthy workplace.

- We are dedicated to complying with all environmental, health and safety laws and regulations wherever we conduct business around the world.
- I&MSE aim for excellence by implementing our H&S Management System with its supporting health, safety and environmental Standards and Procedures. This provides the framework and tools to enable managers and employees to perform work without injury to employees, contractors and others, and to prevent harm to the environment. The five environmental, health and safety commitments related to our business are: Continual Improvement to protect the environment and provide as safe working environment for us, our contractors, customers and the communities where we operate.
- Control and reduce hazards and business risks. Create products and solutions to improve H&S aspects across product life cycle phases when possible.
- Conserve natural resources and prevent pollution. Compliance to applicable H&S regulations and maintain market access.
- We set targets and objectives to ensure that we continually reduce the number of harmful incidents that occur. And, we work to instill these values in all of our employees, wherever they may be located.

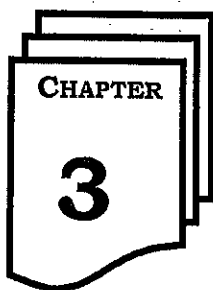
2.6.3 Quality Policy

Ref. QP-9501/R-0608/03

"It is the policy of I&MSE to never compromise on quality and put the zeal of quality work at the vanguard of all that we do."

At I&MS Engineering (Pvt) Ltd, we are committed with the defined fundamental principle as code of operations to support our corporate philosophy and to achieve mission statements. We have well defined quality assessment and assurance procedures producing nothing below then best. Periodical foreign trainings are initiative where professionals from all disciplines and departments of I&MSE are facilitated to become quality and process improvement experts Six Sigma business simplification and continuous quality improvement efforts generated thousands of satisfied customers over the period of Year 1995 -2005 with at least 45% of repeat orders.

We will apply the principles of this quality management standard to all our activities, thereby achieving a true company-wide quality system. Regardless of challenges from cost increase to commodities like fuel and steel, our strategic approach is unchanged and delivered outclass wholesome solutions and significant list of clients. We will ensure that all employees are involved in the drive for excellence in our business as we believe that the abilities, knowledge and experience of our staff are our most valuable resource.



INSTITUTIONAL, LEGISLATION AND POLICY FRAMEWORK

3.1 GENERAL OUTLINE AND SCOPE

The IEE of the proposed enhancement project will be subjected to the pertinent legislative and regulatory requirements of the Government of Pakistan including State laws. This chapter provides an overview of the policy framework and national legislation that applies to the proposed Project.

The environmental study includes primarily Sindh Environmental Protection Act 2014 (SEPA 2014), Sindh Environmental Protection Agency IEE and EIA review regulations (2014). All other laws and guidelines relevant to the project have also been reviewed. This chapter presents a synopsis of environmental policies, legislation and other guidelines that have relevance to the proposed project.

3.2 NATIONAL ENVIRONMENTAL POLICY, LEGISLATION AND GUIDELINES

The enactment of comprehensive legislation on the environment, covering multiple areas of concern, is a relatively new and ongoing phenomenon in Pakistan. Whereas, a basic policy and legislative framework for the protection of the environment and overall biodiversity in the country is now in place, detailed rules, regulations and guidelines required for the implementation of the policies and enforcement of legislation are still in various stages of formulation and discussion. The following section presents a brief overview of the existing national policies, legislation and guidelines.

3.2.1 National Conservation Strategy (NCS)

The National Conservation Strategy (NCS) is the primary Policy document of the Government of Pakistan on national environmental issues. The Policy was approved by the Federal Cabinet in March 1992. The Strategy also attained recognition by international donor agencies, principally the World Bank. The NCS identifies 14 core areas including conservation of biodiversity, pollution prevention and abatement, soil and water conservation and preservation of cultural heritage and recommends immediate attention to these core areas in order to preserve the country's environment.

A midterm review of the achievements of the NCS in 2000 concluded that achievements under the NCS have been primarily awareness raising and institutional building rather than actual improvement to environment and natural resources and that the NCS was not designed and is not adequately focused as a national sustainable development strategy¹. The need therefore arose for a

¹Arthur J. Hanson et al, *Pakistan's National Conservation Strategy Renewing Commitment to Action, Report of the Mid-Term Review, 2000*

more focused National Environmental Action Plan (NEAP) required to bring about actual improvements in the state of the national environment with greater emphasis on poverty reduction and economic development in addition to environmental sustainability.

The NEAP was approved by the Pakistan Environmental Protection Council under the chairmanship of the President/Chief Executive of Pakistan in February 2001. NEAP now constitutes the national environmental agenda and its core objective is to initiate actions that safeguard public health, promote sustainable livelihoods, and enhance the quality of life of the people of Pakistan.

A National Environmental Policy has been approved by the Federal Cabinet in its meeting held during June 2005². This policy has already been endorsed by the Pakistan Environmental Protection Council during 2004. The new policy has total 171 guidelines on sectoral and cross-sectoral issues. The objectives of new policy include assurance of sustainable development and safeguard of the natural wealth of country. The following are the approved Sectoral Guidelines;

- ❖ Water Supply and Management;
- ❖ Air Quality and Noise;
- ❖ Waste Management;
- ❖ Forestry;
- ❖ Biodiversity and Protected Areas;
- ❖ Climate Change and Ozone Depletion;
- ❖ Energy Efficiency and Renewable;
- ❖ Agriculture and Livestock;
- ❖ Multilateral Environmental Agreements.

3.2.2 Sindh Environmental Protection Act 2014

The Sindh Environmental Protection Act, 2014 (SEPA 2014) is the basic legislative tool empowering the government to frame regulations for the protection of the environment. The SEPA 2014 is broadly applicable to air, water, soil, marine and noise pollution. Penalties have been prescribed for those contravening the provisions of the Act.

The two primary deliberations of the Act are the conduct of projects only after approval of environmental assessments from the SEPA and adherence with Sindh Environmental Quality Standards (SEQS).

3.2.3 Approval from Sindh Environment Protection Agency (SEPA)

As per the 2014 Regulations, Proponent will submit an IEE report for their proposed project activities to SEPA, and seek approval on the same from the Agency. Ten (10) hard copies and two(02) soft copies of the IEE report will be need to be submitted to SEPA. It will then grant its decision on the IEE as per the rules and procedures set out in the 2014 Regulations. The following rules will apply:

²National Environmental Policy, GoP, 2005

- ❖ A fee is payable to SEPA for review of the EIA& IEE;
- ❖ The IEE submission is to be accompanied by an application in the format prescribed in Schedule V of the 2014 Regulations;
- ❖ SEPA is to conduct a preliminary scrutiny and reply within fifteen (15) days of the submission of the report a) confirming completeness, or b) asking for additional information, if needed;
- ❖ In the review process SEPA may consult a Committee of Experts, which maybe constituted on the request of the DG SEPA;
- ❖ On completion of the review process, the decision of SEPA will be communicated to the proponent in the form prescribed in Schedule V;
- ❖ Where an IEE is approved, SEPA can impose additional controls as part of the conditions of approval;
- ❖ SEPA is required to make every effort to complete the IEE review process within sixty (60) days of the issue of confirmation of completeness. However, SEPA can take up to four(4) months for communication of final decision;
- ❖ The approval will remain valid for the project duration mentioned in the IEE but on the condition that the project commences within a period of three (03) years from the date of approval. If the project is initiated after three years from approval date, the proponent will have to apply for an extension in the validity period. The SEPA on receiving such request grant extension (not exceeding 3 years at a time) or require the proponent to submit a fresh IEE if in the opinion of SEPA changes in baseline conditions or the project so warrant;
- ❖ After receiving approval from SEPA the proponent will acknowledge acceptance of the conditions of approval by executing an undertaking in the form prescribed in Schedule VI of the 2014 Regulations;
- ❖ The 2014 Regulations also require proponents to obtain from SEPA, after completion of the project, a confirmation that the requirements of the IEE and the conditions of approval have been duly complied with;
- ❖ The SEPA in granting the confirmation of compliance may impose any additional control regarding the environmental management of the project or the operation, as it deems necessary.

3.2.4 Sindh Environmental Protection Agency Review of IEE and EIA Regulations, 2014

The SEPA Review of IEE and EIA Regulations, 2014 (The 2014 Regulations) promulgated under SEPA 2014 were enforced on December, 2014. The 2014 Regulations define the applicability and procedures for preparation, submission and review of IEEs and EIAs. These Regulations also give legal status to the Pakistan Environmental Assessment Procedures prepared by SEPA in 2014.

The Regulation classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules. Schedule I lists projects that may not have significant environmental impacts and therefore require an IEE. Schedule II lists projects of potentially significant environmental impacts requiring preparation of an EIA. The Regulations also require that all projects located in environmentally sensitive areas require preparation of an EIA.

The following project falls under the following category:

Schedule I (IEE):

- Other projects

Any other project for which filing of an IEE is required by the Agency under sub-regulation (2) of Regulation 6.

3.2.5 The Sindh Environmental Quality Standards

During the construction and post development phase of the project SEQs will apply to all effluents and emissions. SEQs for municipal and industrial effluents, selected gaseous pollutants from industrial sources and motor vehicle exhaust and noise are provided in **Exhibit 3.1, Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 & Exhibit 3.4**. SEQs for disposal of solid waste have as yet not been promulgated³.

3.2.6 Land Acquisition Act, 1894

The Land Acquisition Act (LAA) of 1894 amended from time to time has been the defacto policy governing land acquisition, resettlement and compensation in the country. The LAA is the most commonly used law for acquisition of land and other properties for development projects. It comprises of 55 sections pertaining to area notifications and surveys, acquisition, compensation and apportionment awards and disputes resolution, penalties and exemptions.

3.2.7 Pakistan Penal Code (1860)

The Pakistan Penal Code (1860) authorizes fines, imprisonment or both for voluntary corruption or fouling of public springs or reservoirs so as to make them less fit for ordinary use⁴.

3.2.8 The Antiquities Act, 1975

The Antiquities Act of 1975 ensures the protection of cultural resources of Pakistan. The Act is designed to protect 'antiquities' from destruction, theft, negligence, unlawful excavation, trade, and export. Antiquities have been defined in the Act as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The law prohibits new

³ Library, Sindh Environmental Protection Agency, 2016

⁴ www.fmu.gov.pk

construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area that may contain articles of archaeological significance.

Under the Act, the project proponents are obligated to:

- ❖ Ensure that no activity is undertaken in the proximity of a protected antiquity;
- ❖ Report to the Department of Archeology, Government of Pakistan, any archeological discovery made during the course of a project⁵.

3.2.9 The Factories Act, 1934

The clauses relevant to the project are those that concern to health, safety and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulation for handling and disposal of toxic and hazardous materials⁶.

3.2.10 Electricity Act, 1910

The Act provides a legal base for power distribution. A licensee under this Act is enabled to operate supply of electricity. This Act obligate licensee to pay compensation for any damages caused during the constructions and maintenance of any power distribution facilities.

3.3 NATIONAL AND INTERNATIONAL GUIDELINES OR STANDARDS

3.3.1 The Pakistan Environmental Assessment Procedures, 1997

The Pakistan Environmental Protection Agency prepared the Pakistan Environmental Assessment Procedures in 1997. They are based on much of the existing work done by international donor agencies and Non-Governmental Organizations (NGO's). The package of regulations prepared by PEPA includes:

- ❖ Policy and Procedures for Filing, Review and Approval of Environmental Assessments;
- ❖ Guidelines for the Preparation and Review of Environmental Reports;
- ❖ Guidelines for Public Consultation;
- ❖ Guidelines for Sensitive and Critical Areas; and
- ❖ Sectoral Guidelines for various types of projects.

3.3.2 OSHA Standards Health Safety

The Occupational Safety and Health Administration (OSHA) are issuing safety and health program management guidelines for use by employers to prevent occupational injuries and illnesses. The

⁵ pakistancode.gov.pk, 2005

⁶ pakistancode.gov.pk, 2005

Occupational Safety and Health Act of 1970 (OSHA) representatives have noted a strong correlation between the application of sound management practices in the operation of safety and health programs and a low incidence of occupational injuries and illnesses. Where effective safety and health management is practiced, injury and illness rates are significantly less than rates at comparable worksites where safety and health management is weak or non-existent.

OSHA has concluded that effective management of worker safety and health protection is a decisive factor in reducing the extent and the severity of work-related injuries and illnesses. Effective management addresses all work-related hazards, including those potential hazards which could result from a change in worksite conditions or practices. It addresses hazards whether or not they are regulated by government standards.

Pollutant	Time-weighted average	Concentration in Ambient Air	Method of measurement
Sulfur Dioxide (SO ₂)	Annual Average*	80 ug/m ³	Ultraviolet Fluorescence method
	24 hours**	120 ug/m ³	
Oxides of Nitrogen as (NO)	Annual Average*	40 ug/m ³	Gas Phase Chemiluminescence
	24 hours**	40 ug/m ³	
Oxides of Nitrogen as (NO ₂)	Annual Average*	40 ug/m ³	Gas Phase Chemiluminescence
	24 hours**	80 ug/m ³	
Ozone (O ₃)	1 hour	130 ug/m ³	Non dispersive UV absorption method
Suspended Particulate Matter (SPM)	Annual Average*	360 ug/m ³	High Volume Sampling, (Average flow rate not less than 1.1 in 3min/sec).
	24 hours**	500 ug/m ³	
Respirable Particulate Matter PM ₁₀	Annual Average*	120 ug/m ³	β-Ray absorption method
	24 hours**	150 ug/m ³	
Respirable Particulate Matter PM _{2.5}	Annual Average*	40 ug/m ³ ***	Preferably β-Ray absorption method
	24 hours**	75 ug/m ³	
Lead (Pb)	Annual Average*	1 ug/m ³	ASS Method after sampling using EPM 2000 or equivalent Filter paper
	24 hours**	1.5 ug/m ³	
Carbon Monoxide (CO)	8 hours**	5 mg/m ³	Non Dispersive Infra-Red (NDIR) method
	1 hour	10 mg/m ³	

Exhibit 3. 1:SEQS for Ambient Air

*annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

**24 hourly / 8 hourly values should be met 98% in a year. 2% of the time, it may exceed but not on two consecutive days.

***Annual average limit of 40ug/m³ or background annual average concentration plus allowable allowance of 9ug/m³, whichever is lower.

Exhibit 3. 2:SEQS for Municipal and Industrial Effluents^a

Parameters	Into Inland Water(mg/l)	Into Sewage Treatment(mg/l)
Temperature or temperature increase ^c	≤3°C	≤3°C
pH	6-9	6-9
Biochemical Oxygen Demand (BOD ₅) at 20°C ^d	80	250
Chemical Oxygen Demand (COD) ^d	150	400
Total Suspended Solids (TSS)	200	400
Total Dissolved Solids (TDS)	3,500	3,500
Grease and Oil	10	10
Phenolic compounds (as phenol)	0.1	0.3
Chloride (as Cl ⁻)	1,000	1,000
Fluoride (as F)	10	10
Total cyanide (as CN ⁻)	1.0	1.0
An-ionic detergents (as MBAS) ^e	20	20
Sulphate (SO ₄)	600	1000
Sulphide (S ⁻)	1.0	1.0
Ammonia (NH ₃)	40	40
Pesticides ^f	0.15	0.15
Cadmium ^g	0.1	0.1
Chromium (trivalent & hexavalent) ^g	1.0	1.0
Copper ^g	1.0	1.0
Lead ^g	0.5	0.5
Mercury ^g	0.01	0.01

Parameters	Into Inland Water(mg/l)	Into Sewage Treatment(mg/l)
Selenium ^g	0.5	0.5
Nickel ^g	1.0	1.0
Silver ^g	1.0	1.0
Total Toxic metals	2.0	2.0
Zinc	5.0	5.0
Arsenic ^g	1.0	1.0
Barium ^g	1.5	1.5
Iron	8.0	8.0
Manganese	1.5	1.5
Boron ^g	6.0	6.0
Chlorine	1.0	1.0

Notes

^aAll values are in mg/l, unless otherwise defined

^bApplicable only when and where sewage treatment is operational and BOD₅=80 mg/L is achieved by the sewage treatment system

^cThe effluent should not result in temperature increase of more than 3°C at the edge of zone where initial mixing and dilution take place in the receiving body. In case zone is defined, use 100 meters from the point of discharge

^dAssuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Sindh Environmental Protection Agency. By 1:10 dilution means, for example that for each one cubic meter of treated effluent, the recipient water body should have 10 cubic meter of water for dilution of this effluent

^eModified Benzene Alkyl Sulphate; assuming surfactant as biodegradable

^fPesticides include herbicide, fungicides and insecticides

^gSubject to the total toxic metals discharge should not exceed level of total toxic metals

Exhibit 3. 3:SEQS for Selected Gaseous Pollutants from Industrial Sources^a

Parameter	Source of emission	Standard(mg/Nm ³)
Smoke	Any	40% or 2 Ringelmann scale or equivalent smoke number
Particulate matter ^b	Boilers and furnaces:	
	Oil fired	300
	Coal fired	500
	Cement kilns	300
	Grinding, crushing, clinker coolers and related processes, metallurgical processes, converter blast furnaces and cupolas	500
Hydrogen chloride	Any	400
Chlorine	Any	150
Hydrogen fluoride	Any	150
Hydrogen sulfide	Any	10
Sulfur oxides ^c	Sulfuric acid/Sulfonic acid plants	5,000
	Other plants except power plants operating on oil and coal	1,700
Carbon monoxide	Any	800
Lead	Any	50
Mercury	Any	10
Cadmium	Any	20
Arsenic	Any	20
Copper	Any	50

Parameter	Source of emission	Standard(mg/Nm ³)
Antimony	Any	20
Zinc	Any	200
Oxides of nitrogen ^d	Nitric acid manufacturing unit	3,000
	Other plants except power plants operating on oil or coal:	
	Oil Fired	400
	Coal fired	600
	Cement kilns	1,200

Notes:

a All values are in mg/Nm³, unless otherwise defined

b Based on the assumption that the size of the particulates is 10 micron or more

c Based on 1% sulphur content in fuel oil. Higher content of sulphur will cause standards to be pro-rated

d In respect of the emissions of the sulfur dioxide and nitrogen oxides, the power plants operating on oil or coal as fuel shall, in addition to SEQS specified above, comply with the following standards

Exhibit 3. 4:SEQS for Motor Vehicle Exhaust and Noise

Parameter	Standard	Measuring Method
Smoke	40% or 2 on the Ringlemann scale during engine acceleration mode	To be compared with Ringlemann Chart at a distance of 6 meters or more
Carbon Monoxide	6%	Under idling conditions, non-dispersive infrared detection through gas analyzer
Noise	85 dB (A)	Sound-meter at 7.5 meters from the source

Exhibit 3. 5:SEQS for Noise

S.No	Category of Area/zone	Effective from 1st Jan 2016	
		Limits in dB	
		Day Time	Night Time
1	Residential Area	65	50
2	Commercial Area	70	60
3	Industrial Area	80	75
4	Silence Area	55	45

Note:

1. Day Time hours: 6.00am to 10.00pm
2. Night Time hours: 10.00pm to 6.00am
3. Silence Zone: zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

dB: Time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

4.1 GENERAL OUTLINE AND SCOPE

This section of the IEE document presents a detailed description of physical environmental conditions of the study area. The data collection techniques are combination of both primary and secondary means by field verifications, observations, sampling and monitoring which was supplemented by review of published literature and previously conducted studies in the proposed project surrounding areas.

The base line data defines, elaborates and present physical environmental quality within the project surrounding.

Key Features of Physical Baseline

- Topography and land use
- Geology
- Climate
- Air Quality
- Water Resources
- Water Quality

4.2 TOPOGRAPHY AND LAND USE

The city of Karachi has a land area of 3,640 km² and is located on the Arabian Seacoast in the extreme south of Pakistan; the city is located at 24°45" to 25°15" north and 66°37" to 67°03" east. . It is bounded by Dadu District in the northeast, Thatta District in the southeast, the Arabian Sea to the south and the Lasbela District of Balochistan Province to the west.

Karachi may be broadly divided into two parts; the hilly areas in the north and west and an undulating plain and coastal area in the south-east. The hills in Karachi are the off-shoots of the Keirthar Range. The highest point of these hills in Karachi is about 528m in the extreme north. All these hills are devoid of vegetation and have wide intervening plains, dry river beds and water channels. Karachi has a long coastline in the south. Specifically the topography of the study area is quite gentle and its elevation is increasing as we move towards the north. **Exhibit 4.1** represents the topographic elevation map of the proposed project areas.

Exhibit 4.2 represents the land cover pattern of Karachi, while **Exhibit 4.3** represents graphical representation of the land cover pattern of the proposed project area.

Exhibit 4. 1: Topographic Elevation Map of the Proposed Project Areas



Exhibit 4. 2: Graphical Representation of the Land Cover Pattern of the Proposed Project Area

Land Cover and Use Class	Area (Hectares)
Industrial and Commercial Areas	10,210
Built-up Residential Areas	11,938
Agricultural Areas	17,130
Saline Channels and Creeks (Intertidal)	53,765
Mangroves	35,546
Mudflat and Beaches	18,915
Total Study Area	147,504

4.3 GEOLOGY

Geology of the area under focus is underlain a lower Indus basin described as Indus river alluvial early Eocene*. Early deposition of sediments include silt, sand stone, conglomerate, limestone with low compact and cementing materials. As per stratigraphic description, Gazij and Manchar inclined two formations gently northeast to southeast in offshore. The coastal region is found to be of tertiary and post-tertiary origin. Blatter et al (1929) dates it as recent as Eocene.

The exposed geological material in the area is generally silty sand, sandy gravel and silty clay which is either product of in-situ weathering or deposited by the action of gravity and water. The rock formation of this area is from Nari Formation of Oligocene age and partially from Gaj Formation of Miocene age. The underlying rocks are mostly of marine origin, highly folded, faulted and fissured everywhere (*Sidra et al, 2010 Situation Analysis of Sindh Coast Issues and Options*).

4.4 SOIL CONDITION

The soil in the plains of Sindh is plastic clay that has been deposited by the Indus, Combined with water it develops into a rich mould and without water it degenerates into a soil of desert category. Nearly the entire Indus valley has soil which is extremely friable and easily disintegrated by the flow of water. Resultantly, the water always contains a large amount of suspended silt. The soils are generally secondary in nature deposited by the water or air in the area of the candidate sections. The soils in the vicinity are generally coarse textured extensively laden with gravels and pebbles. Due to scarcity of water and non-conductive conditions, the soils are rarely cultivated.

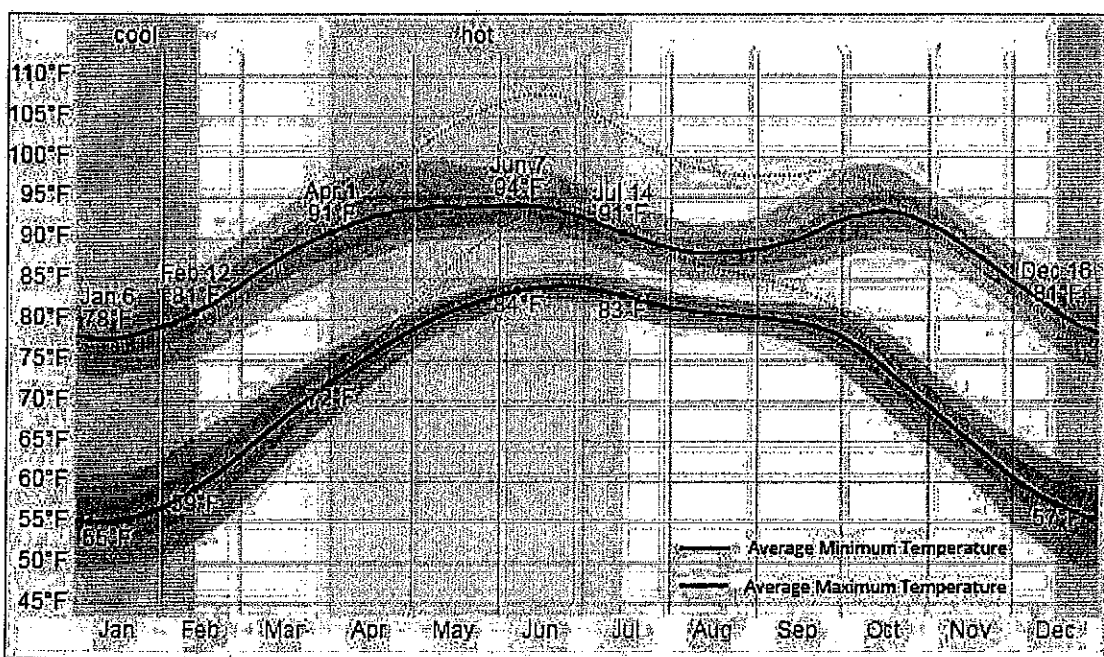
EOCENE

The Eocene Epoch, lasting from 56 to 33.9 million years ago, is a major division of the geologic timescale and the second epoch of the Paleogene Period in the Cenozoic Era

4.5 CLIMATE

The climate of Karachi is characterized as hot and dry during summer, and mild during winter with heavy, sporadic, rainfall during the monsoon. The summer monsoon prevails in the Proposed Project area from Mid-March to Mid-June characterized by very hot temperatures, dry conditions, moderate wind from the southwest and low humidity; high rainfall, high temperatures, high humidity characterize Monsoons from Mid-June to Mid-September, and high winds from the southwest. Although the temperatures are milder compared to summer but high humidity makes the heat oppressive; Post-monsoon summer that is from Mid-September to Mid-November is characterized by cessation of rains and reduction in wind speed. Temperature increases by couple of degrees and humid decreases by about 10%; and winters monsoon from Mid-November to Mid-March is characterized by moderate temperature, dry conditions, low humidity, and low winds from the north and northeast. The monsoon is characterized by a reversal in wind direction during the remaining months and heavy rainfall occurs over most part of the Indian Subcontinent. In Karachi over the course of the year, the temperature typically varies from 55°F to 94°F and is rarely below 49°F or above 100°F. Yearly mean maximum and minimum temperatures from January 1, 1980 to December 31, 2016 are presented below in **Exhibit 4.4**.

Exhibit 4. 3: Mean Maximum and Minimum Temperature of Karachi (January 1-1980 to December 31-2016)



Source: Weather Spark.com

4:6 RAINFALL

According to IPCC report, 2007 decrease in rainfall pattern has been observed along the coastal belt and arid plains of Pakistan, in upcoming years most part of Pakistan will experience dry humid conditions especially Sindh, Balochistan, Punjab and the central parts of Northern Areas will receive

less than 250 mm of rainfall in a year (PMD). The yearly average rainfall pattern of Karachi from January 1, 1980 to December 31, 2016 shows some seasonal variation in monthly rainfall.

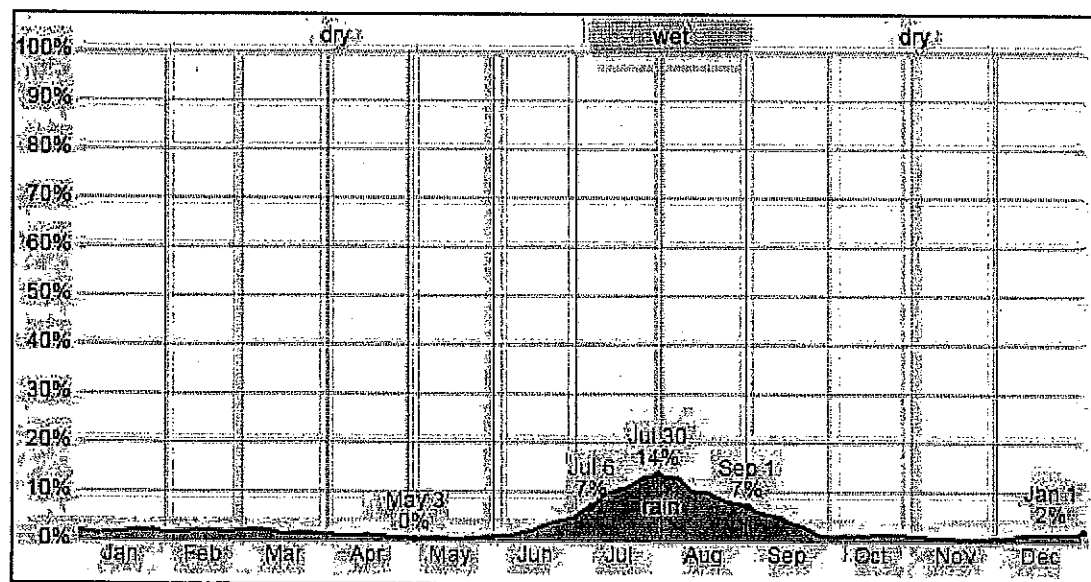
The *rainy period* of the year lasts for 3 months, from June 25 to September 15,. The most rain falls during the month of July. The *rainless period* of the year lasts for almost 9 months, from September 15 to June 25. The least rain falls around May.

The probability of precipitation and wet days observed at KIA varies throughout the year. The *wetter season* lasts 2 months, from July 6 to September 1. The chance of a wet day peaks at 14% on July 30.

The *drier season* lasts 10 months, from September 1 to July 6. The smallest chance of a wet day is 0% on May 3.

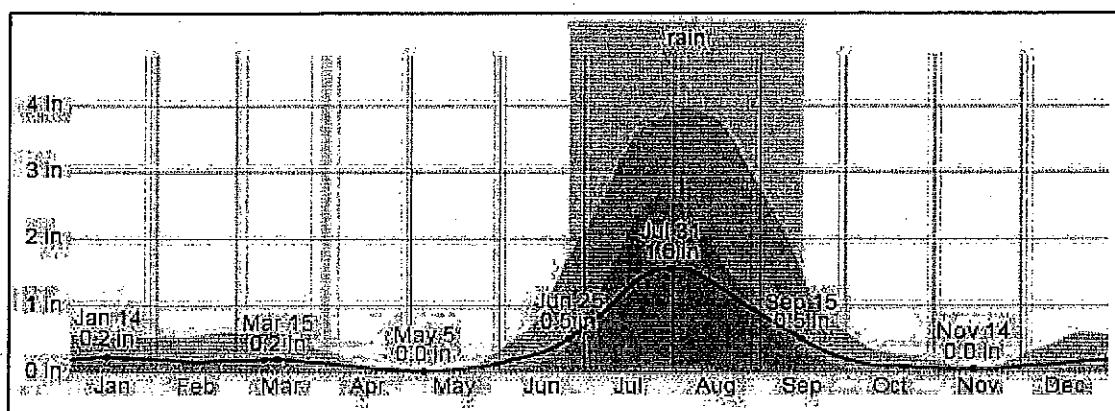
Based on the categorization of *rain alone*, *snow alone*, or a mixture of the two, the most common form of precipitation throughout the year is *rain alone*, with a peak probability of 14% on July 30. The mean monthly precipitation records for Karachi South District can be seen in **Exhibit 4.5**, while **Exhibit 4.6** mean monthly rainfall pattern of Karachi presented below.

Exhibit 4. 4:Maximum Precipitation (%) (January 1-1980 to December 31-2016)



Source: Weather Spark.com

Exhibit 4. 5:Average Monthly Rainfall (January 1-1980 to December 31-2016)



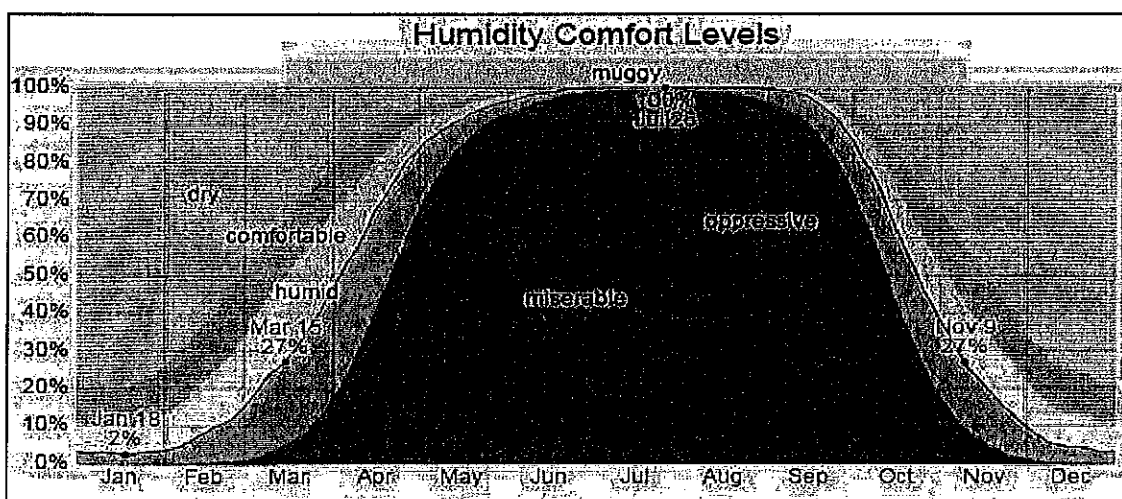
Source: Weather Spark.com

4.7 RELATIVE HUMIDITY

Karachi experiences *very significant* seasonal variation in the perceived humidity. The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between day and night, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

The *muggier period* of the year lasts for 8 months, from March 15 to November 9, during which time the comfort level is *muggy, oppressive, or miserable* at least 27% of the time. The *muggiest day* of the year is July 26, with muggy conditions 100% of the time. The *least muggy day* of the year is January 18, with muggy conditions 2% of the time. The mean monthly relative humidity for Karachi South district can be seen in Exhibit 4.7.

Exhibit 4. 6:Relative Humidity



Source: Weather Spark.com

4.8 WIND SPEED AND DIRECTION

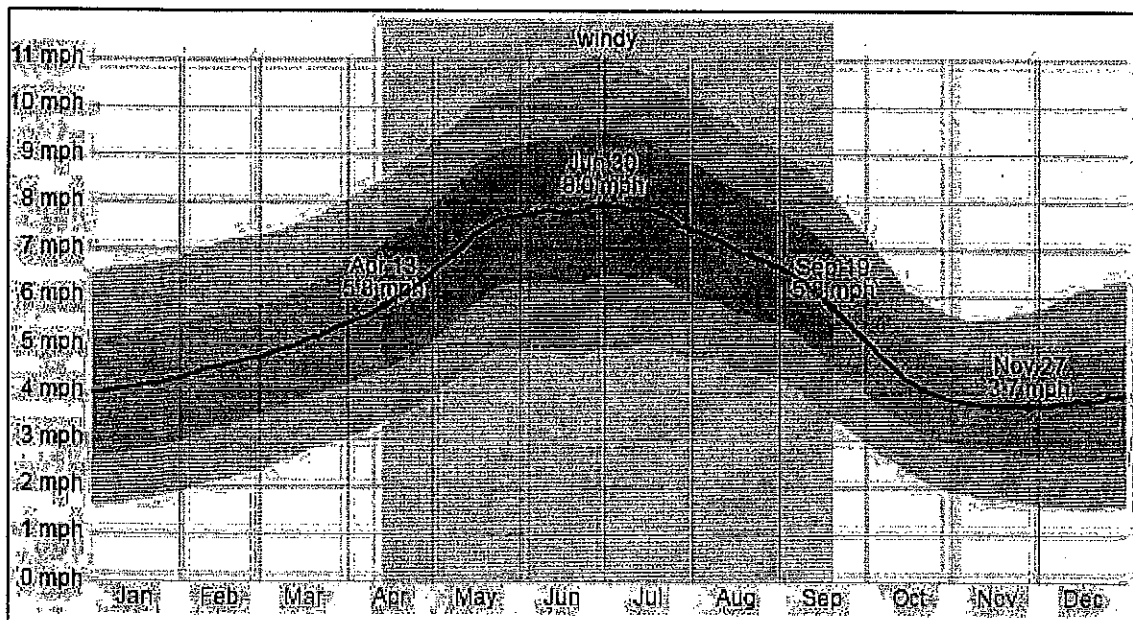
The proposed project area lies in a region where wind blows throughout the year with highest velocities. During summer, the direction of the wind is from south-west to west and during winter season the wind blows from north to northeast and it shifts southwest to west in the evening hours. The wind usually carries sand and salt with it resulting in severe corrosion and erosion. The wind direction and speed in between the two monsoon seasons, summer and winter are rather unsettled and large variations have been recorded in terms of speed and direction. The seasonal winds are dry and have a desiccating effect during May & June, in July and August the wind contains moisture.

The average hourly wind speed in Karachi experiences *significant* seasonal variation over the course of the year. The *windier* part of the year lasts for 5 months, from April 13 to September 19, with average wind speeds of more than 5.8 miles per hour. The *windiest* day of the year is June 30, with an average hourly wind speed of 8.0 miles per hour.

The *calmer* time of year lasts for 7 months, from September 19 to April 13. The *calmest* day of the year is November 27, with an average hourly wind speed of 3.7 miles per hour.

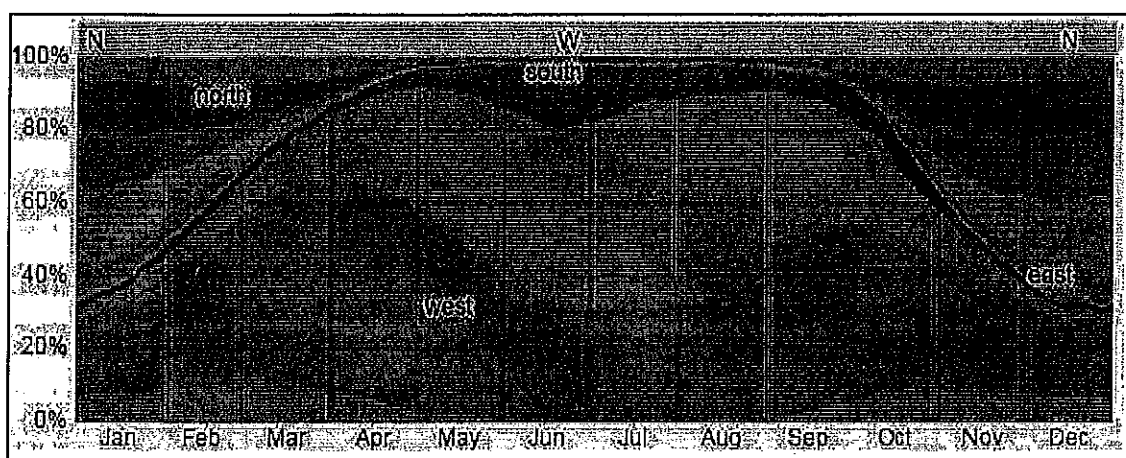
The predominant average hourly wind direction in Karachi varies throughout the year. The wind is most often from the west for 11 months, from January 13 to November 30, with a peak percentage of 92% on May 2. The wind is most often from the north for 1.5 months, from November 30 to January 13, with a peak percentage of 39% on December 8. Exhibit 4.8 and 4.9 shows the average wind speed and direction of wind in the proposed project area.

Exhibit 4. 7: Average Wind Speed (January 1-1980 to December 31-2016)



Source: Weather Spark.com

Exhibit 4. 8: Wind Direction over the Entire Year (January 1-1980 to December 31-2016)



Source: Weather Spark.com

4.9 AMBIENT AIR QUALITY& NOISE LEVEL

Air pollution has a direct impact on the health of humans and the environment. To assess the ambient air quality baseline components in the proposed project surrounding, the ambient air monitoring equipment was placed at different sample locations by team of Environmental Sampling and Monitoring (ESM). The ESM carried out ambient air monitoring on 27th August, 2018 at 5 different locations with the project surrounding to monitor the compliance status under SEQS. Ambient air quality and noise level sampling map and monitoring results can be seen in **Exhibit 4.10**, **Exhibit 4.11** and **Exhibit 4.12** respectively.



Exhibit 4. 9:Ambient Air Quality and Noise level Monitoring Results.

S.no	Parameters	Units	SEQS Limits	Concentration				
				Location-1	Location-2	Location-3	Location-4	Location-5
1	Carbon Monoxide (CO)	mg/m ³	10	<1	<1	<1	<1	<1
5	Particulate Matter (SPM)	ug/m ³	500	111	102	109	106	100
6	Particulate Matter (PM ₁₀)	ug/m ³	150	67	62	69	71	68
7	Particulate Matter (PM _{2.5})	ug/m ³	75	32	36	31	39	42
8	Noise	dB	80	56	55	59	60	62

4.10 WATER RESOURCES

This section details the water resources of the proposed project area. Both, surface and ground water resources have been summarized in this section of the report. Data was obtained through field observation, secondary sources and data collection (IEE field survey).

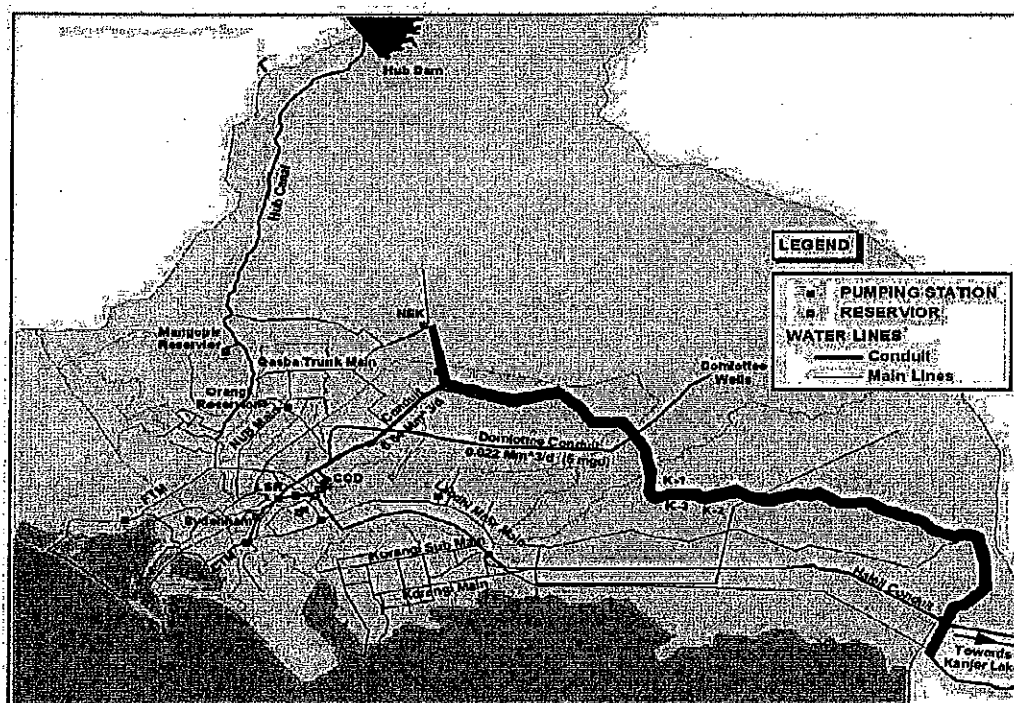
4.10.1 Surface Water Resources

There are no significant natural freshwater sources in the proposed project area. The Indus River is about 85 km to the east of Karachi city and the Hub River lies at a distance of 60 km to the north west of Karachi. A perennial stream that originates from Balochistan and marks the boundary between Karachi Division and Balochistan are the sources of fresh water in Karachi. The Lyari and Malir Rivers that passes through the city do not have any natural flow, except during the monsoons. The Lyari River falls in Kemari and Malir River falls in Gizri Creek. Malir River is ephemeral and is constituted from two major tributaries, i.e. Mol and Khadeji as well as some minor tributaries. Khadeji is a perennial stream that originates at Khadeji falls and gains flow as it travels across the Malir Basin. Port Qasim lies on the inactive and western extent of the Indus delta which is largely arid and swampy; the deltaic coastline associated with Indus Delta is dissected by 17 major creeks and numerous minor creeks. The major creeks of the Indus Delta within the study area include the Phitti, Khuddi and Khai Creeks. Minor creeks, within the study area includes Korangi, Gizri, Kadiro, Issaro, Gharo, Chann Waddo and Rakhal creek.

The Indus River had a river-dominated estuary but due to the increasing demand of fresh water and increasing number of dams and reservoirs the discharge of fresh water to the deltaic region became low which is critically affecting the growth of mangroves and the aquatic flora and fauna. However, the flow of fresh water increases during summer southwest monsoon season. In between 1940s and 1950s embankments were constructed on Haleji and Keenjhar lakes to divert freshwater from Indus River into these lakes and to feed the dry Gharo River. The diverted water again re-enters the intertidal delta within the study area at a distance of 17 kilometers. The water from the Keenjhar Lake is also used for canal-fed irrigation within the eastern side of study area.

The main source of freshwater into the intertidal deltaic creeks of the study area is rain and associated runoff during the summer monsoon. The rainwater drains the land in the north of the study area and joins the intertidal deltaic creeks along the Gharo River, Malir River, ephemeral drains such as Badalnullah, Ghaggarnullah, Latnullah, and Mahyonullah, as well as wastewater drains, particularly into Korangi Creek. The existing water supply network of Karachi is represented as **Exhibit 4.13**.

Exhibit 4. 10:Water supply network of Karachi city



Source: Karachi strategic development plan 2020

4.11 CHEMICAL AND MICRO BIOLOGICAL ANALYSIS OF WATER RESOURCES

Since the key component of the proposed project lies in KCIP, therefore the drinking water was collected from NIP facility and subjected to microbial and chemical analysis in the Lab. The laboratory results of drinking water are presented below in Exhibit 4.14 and Exhibit 4.15.

Exhibit 4. 11: Chemical analysis results of Drinking Water

S. No.	Parameters	Units	SSDWQ	Concentration	Method
1	pH	—	6.5-8.5	7.30	pH meter
2	Total Dissolved Solids	mg/l	1000	322	APHA 2540 C
3	Total Suspended Solids	mg/l	—	1	Hach Method 8006
4	Chloride	mg/l	250	8.5	APHA 4500 Cl C
5	Total Hardness*	mg/l	<500	134.2	APHA 2340 C
6	Fluoride*	mg/l	≤1.5	0.12	Hach Method 8029
7	Nitrate	mg/l	<50	0.7	Hach Method 8039
8	Nitrite	mg/l	<3	0.002	Hach Method 8507

S. No.	Parameters	Units	SSDWQ	Concentration	Method
9	Sulphate*	mg/l	250	26	Hach Method 8051
10	Bicarbonate	mg/l	—	34	APHA 2320 B
11	Residual Chlorine	mg/l	0.5	0.02	Hach Method 8021

Exhibit 4. 5: Microbial Analysis Results of Drinking Water

S. No.	Parameters	Recommended Value	Results
1	Total Colony Count	<500 cfu / ml	150cfu / ml
2	Total Coliform	0 cfu / 100 ml	3cfu / 100 ml
3	Faecal Coliform	0 cfu / 100 ml	0cfu / 100 ml
4	Faecal Streptococci	0 cfu / 100 ml	0cfu / 100 ml

**Recommended Values as per WHO guidelines for Drinking Water*

4.11.1 Groundwater Resources

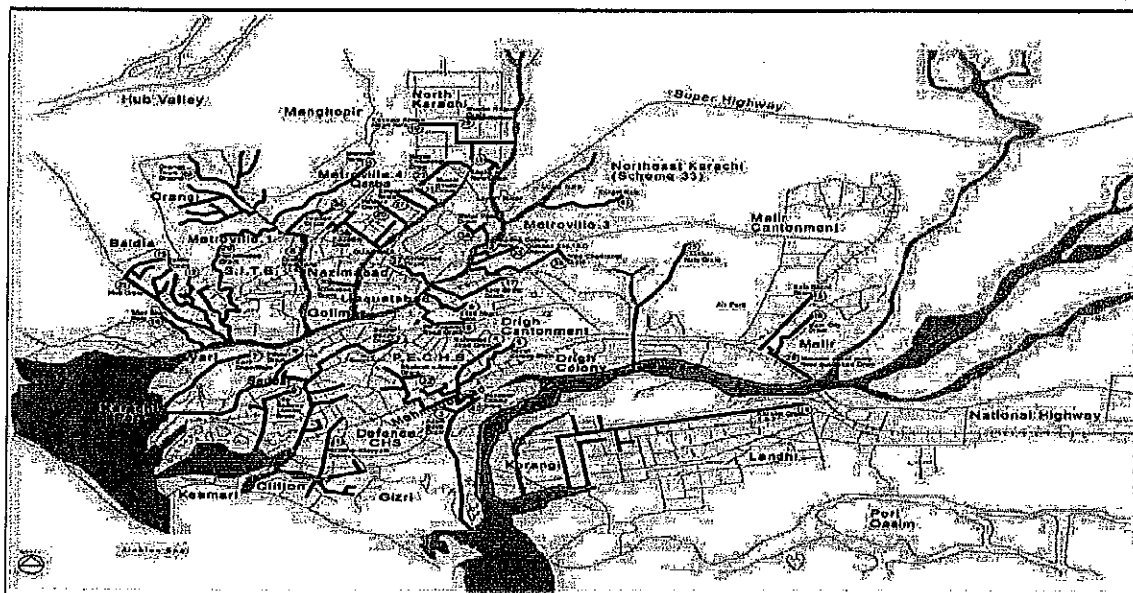
Groundwater resources in Karachi Division are limited. The aquifers close to the coastal belt are mostly saline and dry and this water cannot be used for drinking, domestic and agriculture purposes. Meanwhile the aquifers which lies near the vicinity of the Hub River belt are well developed and is a source of water for agriculture and other domestic purposes. Generally, the aquifers in the proposed project area are estimated to lie at depths of about 30ft to 40ft.

4.12 SURFACE WATER DRAINAGE

The drainage pattern of Karachi is dominated by dendritic. The surface drainage of Karachi City is divided in four parts based upon surface runoff and streams flow.

- ❖ Malir River Basin
- ❖ Lyari River Basin
- ❖ Budnai Basin
- ❖ Coastal Basin

The Malir River basin and the Lyari River basin are two main basins which contribute about 80 percent of the surface runoff. The Budnai basin and the coastal basin are minor basins. All basins collect surface runoff through hundreds of small and large channels which finally drain into sea. The drainage system of Karachi city is shown in **Exhibit 4.18**.

Exhibit 4. 12:Water Drainage System of Karachi

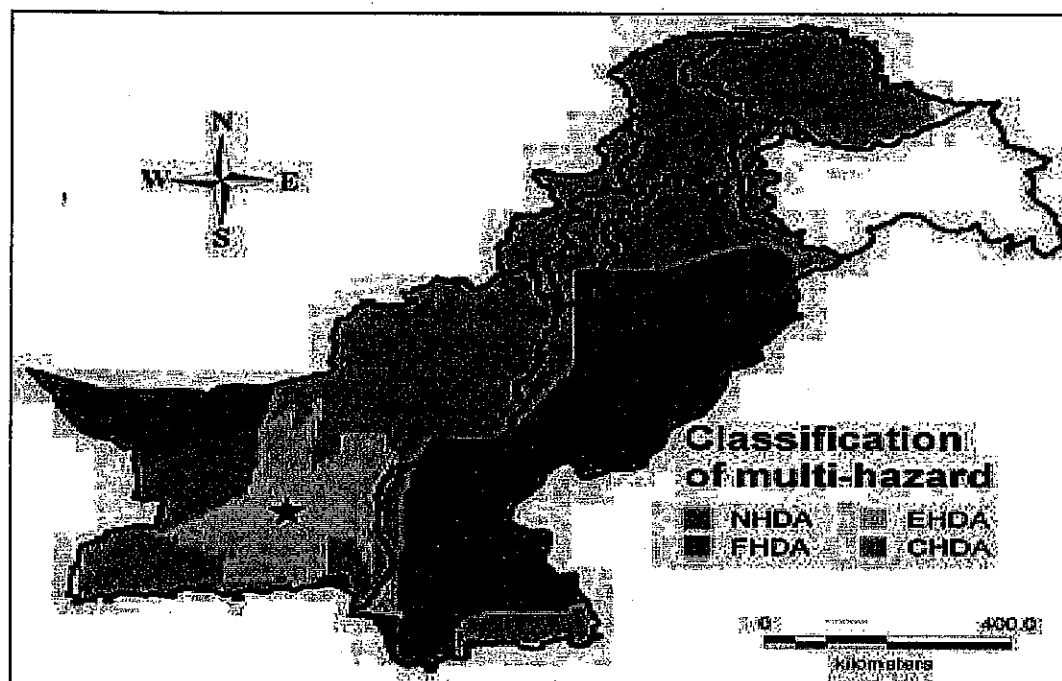
Source: Karachi strategic development plan 2020

4.13 - DISASTER RISKS

The province of Sindh has historically suffered from both natural and human induced disasters. The high level of risk is mainly from floods/ heavy rains, cyclones in coastal area, sea intrusion, droughts, earthquakes, epidemics etc.

The multi-hazard map that takes into account various natural hazards identifies this area as earthquake dominant. Hence it verifies that the probability of occurrence of a specific natural hazard is correctly shown in the Exhibit 4.19.

Exhibit 4. 13:Classification of multi-hazard zoning map



NHDA : No Hazard Dominated Areas

EHDA:Earthquake Hazard Dominated Areas

FHDA : Flood Hazard Dominated Areas

CHDA : Combined Hazard Dominated Areas

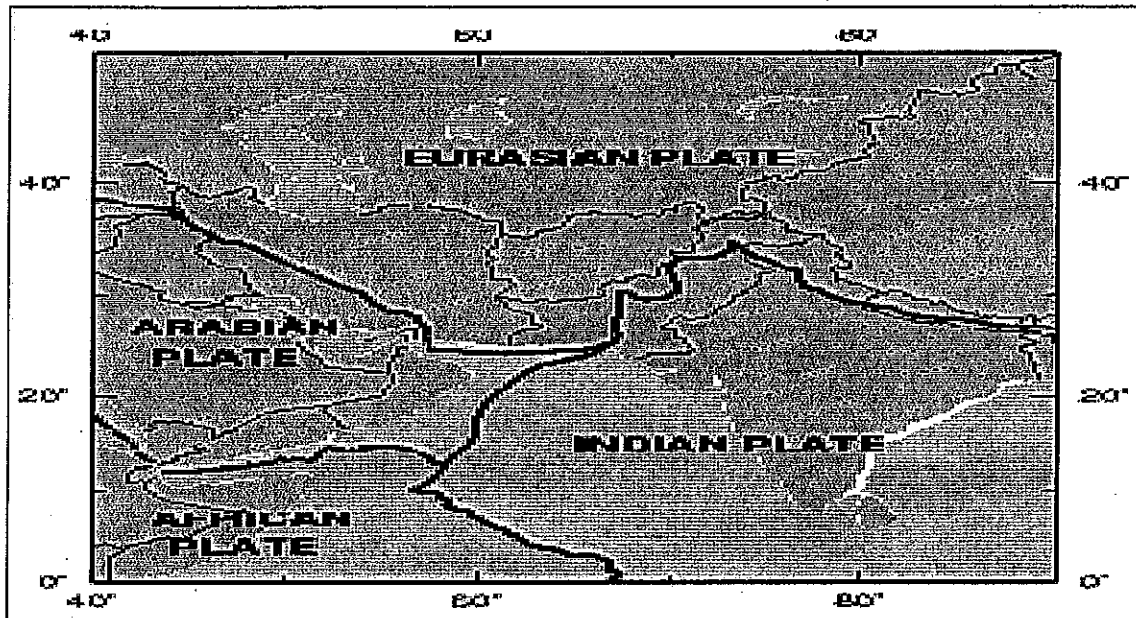
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4.14 FAULTS, EARTHQUAKES AND SEISMIC HAZARD

Being located close to the collision boundary of the Indian and Eurasian plates, Pakistan lies in a seismically active zone. Pakistan is located in the Indus-Tsangpo Suture Zone, which is roughly 200 km north of the Himalaya Front and is defined by an exposed ophiolite chain along its southern margin. This region has the highest rates of seismicity and largest earthquakes in the Himalaya region, caused mainly by movement on thrust faults. Seismic zone mapping of Pakistan has divided the country into four seismic zones ranging in term of major, moderate, minor and negligible zones with respect to ground acceleration values. Under this zoning Karachi Division has been identified on the edge of moderate to high hazard zone. This zone has minor to moderate damaging affect. The proposed Project Site KCIP is located adjacent to an active tectonic setting, and is approximately 190 km east of the triple continental junction between the Arabian, Eurasian and Indian plates. The tectonic map of Pakistan is presented in **Exhibit 4.20**Tectonics Map Pakistan

Exhibit 4. 14:Tectonics Map of Pakistan



The study area experiences an earthquake density of less than 1 Richter Scale per year. Earthquake epicenters, for magnitudes between 3.8 and 5.5 ML, have been recorded along the Pab fault, Hab fault, Ornach-Nal fault, smaller micro faults east of Karachi and in the offshore areas southwest of Port Qasim. Based on the Global Seismic Hazard Map Project (GSHAP), the peak ground acceleration (PGA) of 10 % in 50 years is 1.6 m/s^2 . Exhibit 4.21 represents seismic hazard map of Pakistan.

Exhibit 4.21: Seismic Hazard Map of Pakistan



Source: United States Geological Survey (USGS), "Seismic Hazard Map of Pakistan" (based on GSHAP), accessed 15 September 2014, <http://earthquake.usgs.gov/earthquakes/world/pakistan/density.php>

4.14.1 Flooding

Urban flooding is caused by heavy rainfall overwhelming drainage capacity. Cities have been growing with alarming rate. This problem is important both in developed and under developed Cities like other mega cities of the world flooding has become a serious hazard in the mega cities of Pakistan. The meteorological data of rainfall and hydrological data of surface runoff reveal that occurrence of flood is not the new phenomenon in Karachi. The severe flood occurred in the city, the history of that events and its flow in Malir River were recorded which are shown in **Exhibit 4.24**.

Exhibit 4. 15:History of severe floods in Karachi

Year	Rainfall (mm)	Surface Runoff (000 cubic metres) in Malir River
1930	408.3	209166
1944	676.3	391997
1956	414.2	104164
1959	688.8	330385
1961	621.8	267201
1967	713.0	348451
1970	475.0	172800
1977	489.0	123708
1994	481.0	124178
2007	465.6	118710

Source: Pakistan Meteorological Department and WAPDA

4.14.2 Tsunamis

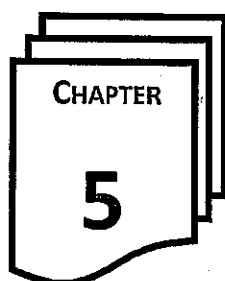
The coastal belt of Pakistan is located in an area of potential tsunami. While large tsunami genetic earthquakes have been relatively rare but there is potential for a tsunami associated with the Makran Subduction Zone (MSZ) or smaller localized tsunamis associated with several smaller thrust faults around Karachi.

Coastal areas of Karachi might experience the effect of Tsunamis as the coast line of Pakistan has had already experienced this natural hazard in the recent past. An earthquake of magnitude 8.3 generated a destructive tsunami wave in the Northern Arabian Sea and the Indian Ocean on 28th November, 1945, producing 12 m to 15 m high sea waves that killed at least 4,000 people in Pasni

and adjoining areas. The tsunami hit as far as Mumbai in India. Karachi, about 450 km from the epicenter, experienced 2 m high sea waves which affected harbor facilities. Hence, the occurrence of tsunami cannot be ruled out in future. The city of Karachi lie close to potential epicenters for large earthquakes and it demands attention of the local government to enhance the capacity for managing disastrous situation, for minimizing disaster risk and response in order to reduce losses from tsunami or other climatic events. The coastal belt of Pakistan is also highly vulnerable to cyclones and associated storm surges. It has been recorded that Fourteen cyclones events had occurred between 1971 and 2001 (NDRMFP, 2007)

4.14.3 Storms and Cyclones

Tropical cyclones also occur periodically in the coastal areas. These cyclones have high intensities. A total of 14 cyclones have been observed which reached the coastal areas of Pakistan since 1971 to 2001. The cyclone of 1999 in Thatta and Badin districts wiped out 73 settlements and killed 168 people and 11,000 cattle's. Nearly 0.6 million people were affected. It destroyed 1800 small and big boats and partially damaged 642 boats, causing a loss of Rs.380 million. Losses to infrastructure were estimated to be Rs.750 million. Climate change may increase the frequency and intensity of storms and could cause changes in their tracks. Although the frequency of cyclones along Pakistan coast belt is low but it can cause a huge damage when it occurs. Hence the possible occurrence of a future cyclone with severe consequences is quite rare but cannot be ruled out (NDRMFP, 2007).



BIOLOGICAL ENVIRONMENT

5.1 GENERAL OUTLINE AND SCOPE

This section gives the detailed description of the ecological environmental conditions of the study area. The proposed project area under review was assessed for its potential impact on Biodiversity, and ecosystem in short term and long term. The data collection techniques are combination of both primary and secondary. Information was collected from field verifications and observations. Experts in the field of terrestrial ecology were engaged in the area of interest from GEMS. The floral and faunal diversity was determined by observations in and around for the area under focus. A hand-held GPS was used to document changes in the ecological assemblages. Data was also supplemented by secondary means, which included review of published literature and previous IEE/EIA studies, conducted in the proposed project surrounding areas. The base line data defines and elaborates the present ecological environmental quality and features of the proposed project surrounding.

5.2 GENERAL HABITATION OF AREA UNDER FOCUS

The proposed project is located in the jurisdiction of KorangiCreek Industrial Park (KCIP).

Exhibit 5.1: Summary of Biodiversity of the project area

Assemblages	Number of Species
Flora	05
Avifauna	09
Mammalian Fauna	04
Herpetofauna	03

5.3 TERRESTRIAL FLORA

5.3.1 Survey/Sampling Methodology for Terrestrial Flora

The area was surveyed by adopting a plot less methodology based on ocular observations was prepared for the proposed project area.

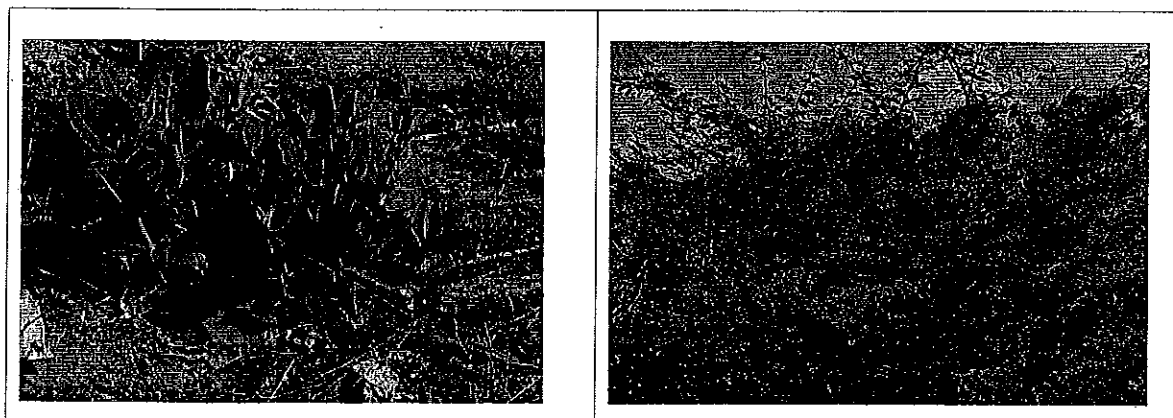
5.3.2 Brief Description

The vegetation is dominated mostly by shrubs; however variations in vegetation composition were observed with varying microhabitats. The associated life forms consisted halophytes belonging to family *Chenopodiaceae*. The other significantly represented members of the floristic list belonged to *Poaceae*, *Asteraceae* and *Zygophylliaceae*. The terrestrial habitat in the Study Area largely consists of arid and dry plain land. No species are present within the facility since it is an already acclaimed land of the proponent. Plant species reported from the surrounding area include Mesquite *Prosopis juliflora*, Indian Milkweed *Calotropis procera* and Caper Bush *Capparis deciduas* the most abundant among these, Mesquite *Prosopis juliflora* is an alien invasive species which is harvested by the locals and sold in the local timber market for fuel wood and construction of local huts. Locals graze their camels on *Mesquite Prosopis juliflora*. The general floristic list observed at the proposed project area is presented as **Exhibit 5.1**, while the pictorial profile of common floral species observed at proposed project area is represented as **Exhibit 5.2**.

Exhibit 5. 1: Floral Species Observed in Terrestrial Habitat of Proposed Project Area

S. No	Plant Species Names	Families Names	Conservation Status
1	<i>Acacia nilotica</i>	Mimosaceae	Not Listed
2	<i>Aerva javanica</i>	Amaranthaceae	Not Listed
3	<i>Azadirachta indica</i>	Meliaceae	Not Listed
4	<i>Atriplex stocksii</i> Boiss	Chenopodiaceae	Not Listed
5	<i>Aeluropus lagopoides</i> (L.) Trin. ex Thw	Poaceae	Not Listed
6	<i>Chloris barbata</i> Sw	Poaceae	Not Listed
7	<i>Calotropis procera</i>	Asclepiadaceae	Not Listed

Exhibit 5. 2: Pictorial Profile of Common Floral Species of the Project Area



<i>Calotropis procera</i>	<i>Prosopis juliflora</i>
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5.3.3 Conservation Status

Based on information available in the EIA/IEE for project in KICP, and literature review, no threatened or endemic terrestrial plant species has been reported from the Study Area. In addition, their distribution is not limited to any specific site or habitat type, and is widespread. Moreover, the area under the control of National Industrial Parks Development and Management and declared as "Protected Forests".

5.4 TERRESTRIAL FAUNA

5.4.1 Survey/Sampling Methodology for Mammalian Fauna

Direct count method was adopted to identify total number of species during the ecological/baseline surveys.

5.4.1.1 Brief Description

Due to urban environment of the proposed project site and its surroundings, there are no proper habitats for breeding mammals to survive except cats, dogs or house mice. However, rodent species which have adopted such conditions are well established using hollow structures or even buildings as their nesting places. Presence of 5-10 mammal species were ascertained at the proposed project site and its surroundings which includes, five striped palm squirrel, house rat and house mouse are the common species of the area while small Indian grey mongoose is less common. **Exhibit 5.3** shows the species of mammals recorded in the proposed project area including their status and listing.

Exhibit 5.3: Mammalian fauna Observed at Project Area

S.No	Common Name	Scientific Name	Occurrence				Listing		
			Common	Abundant	L. Common	Rare	SWPO	Red list	Appendix/ CTES
1	Five striped palm squirrel	<i>Funambulus pennantii</i>	x						
2	House mouse	<i>Mus musculus</i>	x						
3	House rat	<i>Rattus rattus</i>	x						
4	Indian grey mongoose	<i>Herpestes edwardsi</i>			x				III
5	Indian bush rat	<i>Golunda ellioti</i>			x				

5.4.1.2 Conservation Status

Based on information available in the EIA/IEE for project in the area, and literature review, none of the species has been reported from the Study Area as protected, threatened or included in the CITES appendices except the Indian grey mongoose which is listed on CITES Appendix III by India. This species is found in numerous protected areas. Populations are not quantitatively monitored in any country; but the species remains widely and commonly seen in human-dominated areas, indicating a lack of significant ongoing threats and no need for conservation action¹.

5.4.2 Survey/Sampling Methodology for Herpetofauna

The area was surveyed by active examining during the day with the ocular observations. The sampling sites were actively searched for all types of reptiles with a focus on their microhabitats.

5.4.2.1 Brief Description

The specimens were identified with the help of the most recent keys available in literature (Khan, 2006). A low abundance and diversity of the reptiles species has been observed and reported in the study area with small mammals such as rodents, squirrels etc. A total 5 species were recorded during field visit. Most of the reptiles observed were seen associated with vegetation. The most commonly observed reptile species of the study area was the Sindh Gecko *Crossobamonorientalis*. Exhibit 5.4 represents the species of reptiles recorded in the proposed project area including their status and listing.

Exhibit 5. 4: List of Reptiles observed at Proposed Project Area

S.No.	Common Name	Scientific Name	Occurrence				Listing	
			Common	Abundant	L Common	Rare	SWPO	Red list Appendix/CITES
1.	Garden lizard	<i>Calotes versicolor</i>	x					
2.	Glossy –bellied Racer	<i>Coluberventromaculatus</i>	x					
3.	Indian spiny tailed lizard	<i>Uromastyxhardwickii</i>	x					
4.	Saw Scaled Viper	<i>Echiscarinatus</i>	x					
5.	Sindh Gecko	<i>Crossobamonorientalis</i>	x					

¹ <http://www.iucnredlist.org/details/41611/0>

5.4.2.2 Conservation Status

Based on information available in the EIA/IEE for projects at the project site, and literature review, none of the species has been reported from the study area as protected, threatened or included in the CITES appendices and IUCN Red List 2014.

5.4.3 Survey/Sampling Methodology for Endemic Birds

To estimate avifaunal diversity of the proposed project area individual count technique was used by using binocular spotting technique during field surveys and the identified species were immediately recorded and reported accordingly.

5.4.3.1 Brief Description

Both water and land birds have been reported from the project site. Most of these birds are omnivores while others scavenge on marine crabs and dead fish. It is important to note that due to seasonal variation all the reported avifaunal species of the project area were not sighted during the field surveys therefore additional support from previous EIA/IEE studies was taken in this regard. The avian species, which are quite abundant and common in the project area, include Indian Roller, Green Bee Eater, Indian Myna, Jungle babbler. A detailed list of Identified avifaunal species is presented as Exhibit 5.5.

Exhibit 5. 5: List of Avifaunal Species observed at Proposed Project Area

S. No	English Name	Scientific Name
1	Blue Rock Pigeon	<i>Columbia livia</i>
2	Black Drongo	<i>Dicrurus macrocecercus</i>
3	Black Tailed Godwit	<i>Limosa limosa</i>
4	Black Winged Stilt	<i>Himantopus himantopus</i>
5	Black-bellied Plover	<i>Pluvialis squatarola</i>
6	Common babbler	<i>Turdoides caudatus</i>
7	Hoopoe	<i>Upupa epops</i>
8	House Sparrow	<i>Passer domesticus</i>
9	Indian Ring dove	<i>Streptopelia decaocto</i>
10	Indian Myna	<i>Acridothera tristis</i>
11	Indian Roller	<i>Coracias benghalensis</i>

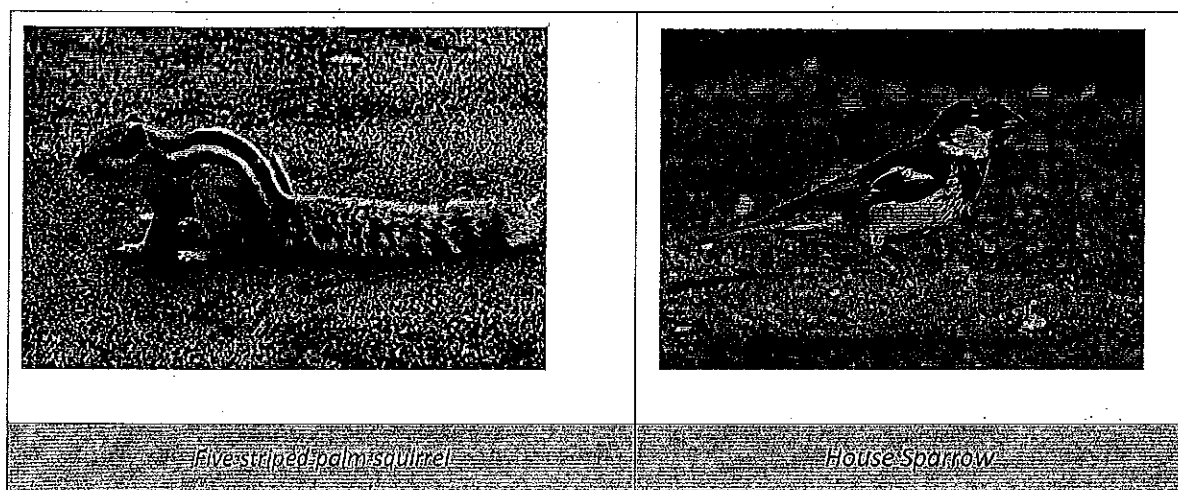
S. No	English Name	Scientific Name
12	Pariah Kite	<i>Milvus migrans</i>
13	Red wattled Lapwing	<i>Vanellus indicus</i>
14	Rose ringed parakeet	<i>Psittacula krameri</i>
15	Sind-tailed Bee-eater	<i>Merops orientalis</i>
16	Sindh House Crow	<i>Corvus splendens</i>

5.4.3.2 Conservation Status

Based on information available in the EIA/IEE for projects in KCIP, and literature review none of the species are protected under the Sindh Wildlife Protection Ordinance (SWPO) and IUCN Red List 2006 as Near Threatened (NT).

The pictorial profile of terrestrial fauna observed at proposed project area is represented as **Exhibit 5.6**.

Exhibit 5.6: Terrestrial Fauna of the Proposed Project Area



CHAPTER 6

SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

5.1 GENERAL OUTLINE AND SCOPE

A team comprising a sociologist and environmental assessment specialist carried out the study of socio economic and cultural environment within the project area. The approach and methodology during data gathering was a combination of qualitative and quantitative techniques. The data collection addresses the primary requirements of an Initial Environmental Examination (IEE), incorporating the Pakistan Environmental Assessment Procedures 1997.

A Participatory Rural Assessment was combined with the extensive qualitative data collection of socio-economic and cultural data through short structured questionnaires and focus group interviews with communities including men and key male informants in project surrounding areas within 5 km radius of project vicinity. The relevant and accurate information was obtained with efficiently in terms of time and area coverage by rapid cycles of interaction among team members, communities and area elders. The specific tools used for collection of data includes, direct observation, short questionnaire, focus groups and semi-structured interviews. A brief of socioeconomic features of the project area is given in **Exhibit 6.1** in the end of this chapter.

6.1.1 PROJECT LOCATION AND ADMINISTRATIVE SETUP

The proposed power Plant will be installed Plot # WH-01-20-A7-A8, in Korangi Creek Industrial Park (KCIP), the National Industrial Parks (NIP), a subsidiary of PIDC, launched the Korangi Creek Industrial Park (KCIP) project in the Korangi Creek cantonment in 2010. Now it's been developing the world-class industrial park that offered a one-window operation. This industrial park was envisioned to have all the basic amenities/ utilities at the doorstep to facilitate establishment of industrial units.

The detail of supporting infrastructure can be seen in Exhibit 6.1

Location	Sector 38, Korangi Industrial Area, Karachi, Sindh	
S.NO	Supporting Infrastructure	Description
01	Industrial Clusters	Low Density Zone: Light Engineering, Food Processing, Consumer Food & Pharmaceutical Products, Garments / Value added Textiles, Packaging & Printing

		&Warehousing/Logistics (G + 4 Allowed) 0.5 to 1 Acre High Density Zone: Commercial and Business Centers, Information Technology, Gems & Jewelry (G + 19 Allowed) from 0.5 Acre
02	Connectivity	<ul style="list-style-type: none"> Karachi Sea Port 22 km I.I. Chundrigar Road 13 km Quaid-E-Azam International Airport 20 km Super Highway 30 km National Highway 34 km
03	Special Economic Zone Benefits	SEZs will have exemption from custom duties and taxes for all capital goods Imported into Pakistan Exemption from all taxes on income accruable in relation to the development and operations of the SEZ for a period of ten years.
04	WaterSupply	Karachi Water and Sewerage Board (KWSB)
05	Power Supply	Captive Power Plant
06	Telecommunication System	Telephone Lines with Broadband wireless internet connectivity
07	Gas Supply	Sui Southern Gas Company (SSGC)
08	Roads	Major and minor arterial roads, Utility corridors and sidewalks, Green belts and median for street lighting
09	Other Features	Effluent Treatment Plant, Solid Waste Management, Transport Hub, Weigh Bridge, Vocational Training Center, One Stop Service
10	Services Building	Banks, Insurance Offices, Post Office, Auditorium, Exhibition Hall, Food Court, Emergency Medicare Facility, Recreational Center etc.
11	Security	Secured Boundary Wall with controlled entry and exit with internal patrolling

12	Present Status	Fully functioning administrative and site office, Boundary wall completed Water distribution network with underground and overhead reservoirs, pumping station and generator house completed, Underground sewerage network completed, Laying of electrical distribution network and sub-stations is in progress
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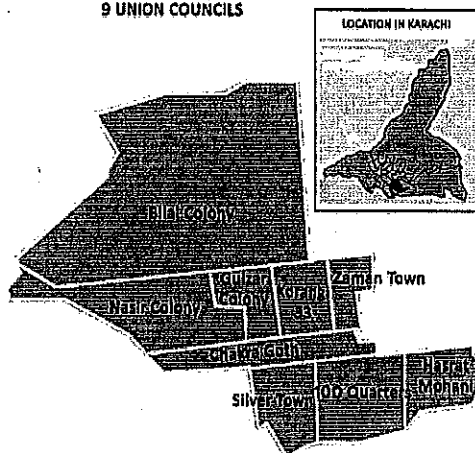
(Source: National Industrial Parks Development & Management)

6.1.2 Korangi Industrial Area

Korangi Industrial Area consists of medium and large size industries. The industrial area houses many industries like Textile, Steel, Pharmaceutical, Automobile, Chemical, Engineering and Flour Mills. The total number of industries in Korangi Industrial Area is approximately 4000.

Korangi Town is one of the 18 towns of the City District Government. Proposed p Site falls in UC (5), in Korangi town. It is a town in the eastern parts of Karachi, Pakistan, south of the Malir River. Karachi division is divided into five districts, Karachi West, Karachi East, Karachi South, Karachi Central and Malir. Karachi East, Karachi South and Karachi Central are entirely urban areas, where as Malir and Karachi west have both urban and rural populations.

KORANGI TOWN, KARACHI
9 UNION COUNCILS



6.1.3 Korangi Town

Korangi Town is bordered by Faisal Cantonment and Shah Faisal Town to the north, Bin Qasim and Landhi to the east and south, Korangi Cantonment to the southwest and Jamshed Town to the west across the Malir River. According to census 2017 total population of District Korangi is 2457019. In Total population males are 1284015, female are 1172737 and Shemale / Transgender are 267. Average annual growth rate is 2.41 from 1998 to 2017. The population of Korangi Town was estimated to be about 550,000 at the 1998 census.

6.1.4 Entry and Exit Points

The major entry and exit road into the project area is the Korangi creek road. One can easily get local public transport (Bus, Mini Bus etc) and taxis to any part of Karachi.

6.1.5 DEMOGRAPHIC AND WELL BEING INDICATORS

6.1.6 Demographics

Karachi is one of the world's most populated cities, spread over 3,530 square kilometers. The city credits its growth to the mixed populations of economic and political migrants and refugees from different national, provincial, linguistic and religious origins that largely came to settle here permanently. Similarly, in this area migrants from all over the country have settled dating several years back. In total four areas were visited in the vicinity of Akhtar Textile Industries Pvt, Limited (2 Km radius). Most of the target areas were densely populated. People living in these areas have migrated from their original areas in search of employment and have been settled here permanently.

6.1.7 Networking and Communication

The major and prominent place of the area is Korangi Crossing which is link to Korangi Creek road and Landhiroad. These road channelized to DHA, Landhi, Korangifish harbour and Port Qasim city. All the target areas have close and regular links to these Chowrangi for business, health facilities and transportation. Small shops were also available inside the localities of the target area. All the areas have metallic roads and were linked to Korangi Industrial Area but in somewhere broken condition.

Most of the people in this area use their own or public transport to access Brookes Chowrangi. There are various modes of transportation available in the target area. There are buses, wagons, rickshaws, taxis etc available for travel inside the city. A reasonable number of bicycles and motorcycles were also visible in the project area. The use of mobile phones and internet for communication is very much common in the area.

6.1.8 Leadership Dynamics

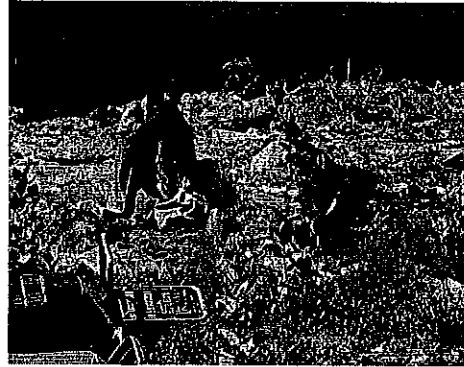
Any strong system of leadership was not observed in the project area. Most of the areas have mix population, so there is not any common leadership available. Every sect has their own leader. The minor conflicts are resolved at Mohalla level by some senior, respectful person, however if the conflict is big and complex, the community approach UC secretary or "Punchayat Committee". Sometimes the conflicts are reported to Police.

6.1.9 Spiritual Leadership

Majority of people (70%) belong to Sunni sect of Islam and around 30% were reported to belong with Shia sect of Islam. Some people of this area visit Dargahs in Sindh and Punjab, but not regularly. Some of them also visit the shrine of Abdullah Shah Ghazi in Karachi. There are a few shrines also observed in the different colonies. However the mosques were available in almost every colony. People contact Darul-Alum or mosque molvi in case of some clarification or getting advice on any religious matter e.g. marriages, zakat, business, interest related financial matters etc.

6.2 LIVELIHOOD

The livelihood of the people in project area mainly depends on labor in nearby industries, Jobs and small business. The residents of, Allah Wala Town, Darussalam Society and Bhattai colony are involved in jobs, labour ship in nearby industries and to some extent small business like running hotels and shops related activities. Most of people are engaged in casual labor on daily wages basis. Some others work in factories and shops. Some people of this area have their own small business i.e. shops etc. A few people in the project area were found extremely poor and they earn their living by collecting valuables from the waste dumps.



Sui Gas is available in the area and all families use this facility for cooking purpose. Electricity is also available and basic electric items i.e. Fan, Tube lights, TV, Washing Machine are available in most of the houses of the area. Some people also have expensive electric items e.g. Fridge, AC available in their homes.

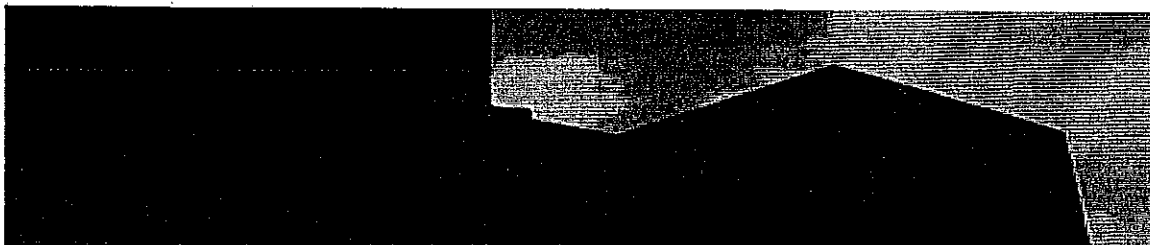
6.3 DRINKING WATER

The source of drinking water in the project area is through water supply but its supply is inadequate. Some people use underground water which is found to be brackish in nature and completely unfit for drinking purpose. Several people are buying the water on daily or weekly basis. One jerry cane costs Rs. 30 to 50, whereas water tanker having the capacity of 1500 to 2000 gallons costs Rs.2500 to 3000. Some household boil drinking water before drinking and some purchase filtered/mineral water.

6.4 EDUCATION

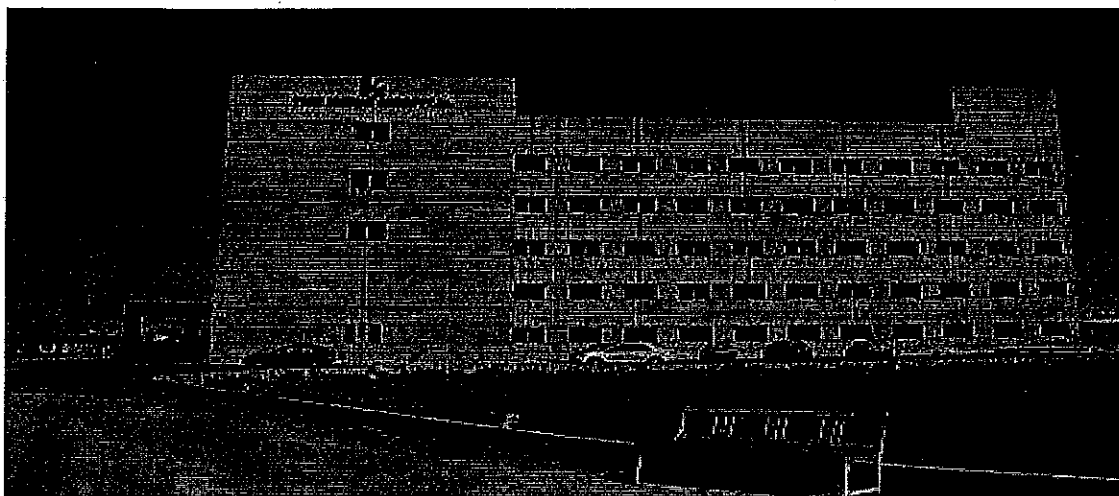
Educational facilities are available in the areas covered due to commercialization of education and active role of private sector. Private organizations have all taken part in providing educational facilities. The various type of schools e.g. government, and private were reported in the target areas. However few elite class higher educational facilities are also located near the project locality, including the College of Business Management Karachi as well as United Medical and Dental College.

6.5 HEALTH & SANITATION



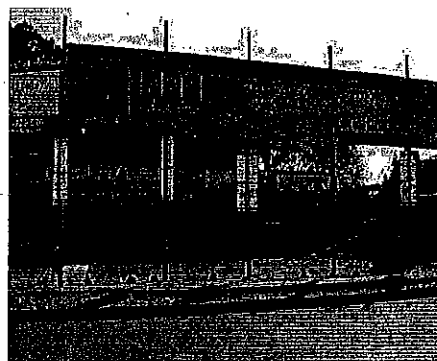
Likewise education institutions, the health facilities provided by the government are also of lower quality in the project area. However it was noted that different health units were located in the project area. About 8 to 10 private clinics are also present within the project vicinity. People visit Indus Hospital, Bilquees Hospital, Fazal-E-Illahi Hospital, Sindh Government Hospital Korangi No. 5, Sindh Government Hospital (Baber Market) and Jinnah Hospital in case of some serious problem. The major health problems of the area are TB, Malaria, Fever and water borne diseases including Hepatitis, Diarrhea, Gastroenteritis, and Fever.

The sanitation conditions are not satisfactory. There is no proper sewerage system; hence most of the houses have open channel "Nallahs" in facing. Neither government nor industries or community based organizations are paying any serious attention towards it. These areas have become a source of several diseases.



6.6 NON GOVERNMENTAL ORGANIZATIONS (NGOS)

The emergence of a vibrant civil society in Sindh can be gauged by the increasing visibility of such organizations and their impact. The expanding advocacy role of NGOs has been recognized by the state. As intermediaries, NGOs have established channels of communication and cooperation between communities on one hand, on the other hand, government institutions and funding of any major NGO was not found in the project area. However there were nominal



social welfare associations at community level working for the welfare of people on small scale.

6.7 CULTURE

Even though people of this area originally belong to various parts of the country, but they have adopted the urban culture of Karachi. The everyday lifestyle of Karachi differs substantially from that of other Pakistani towns. The culture of Karachi is characterized by the blending of Middle Eastern, South Asian and Western influences. There is considerable diversity in culture, and this diversity has produced unique cultural amalgam of its own type. Karachi also hosts the largest middle class stratum of the country. People of this area also practice their original cultural norms.

The increasing cost of living and the availability of employment in the big cities of Pakistan have contributed to a mass exodus of Pushtuns from the rural areas into the cities. There are said to be over 2 million Pushtuns in Karachi alone. Central to identity as a Pushtun is adherence to the male centered code of conduct, the pushtonwali. Women are restricted to private, family compounds in much of the Pathan families, most of the pushtun men working in Karachi leave their wives and daughters at home in the village. But there is a large number of Pathan who has been migrated to Karachi along with their families.

6.8 GENDER ASPECT OF THE PROJECT AREA

Data regarding gender aspect of socio economic study was collected by interviewing local females in Allah Wala Town, Darussalam Society and Bhattai colony. A questionnaire was filled by Focus Group Discussions (FDGs) to collect information with regard to demographic and economic indicators and individual interviews were carried out in different places e.g. Houses, College, Schools, and Clinics etc.

6.8.1 Daily Routine of Women

In Karachi, life is a blend of busy working style. For this project colonies of the surrounding to proposed site were visited. These areas are populated with different cultural communities of the country. During survey it was noted that the women of the project area are very hard working and practical. They normally look after all the household chores from dawn to dusk including making breakfast, cleanliness of home, dish washing, washing the clothes and looking after children and livestock.

Some females also involve in income generation activities e.g.

- Factory Worker.
- Beautician.
- Maids and Teachers etc.

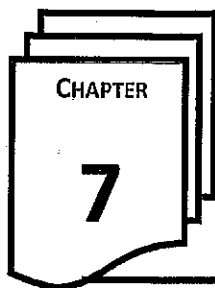
Most of the women in the project area are mainly associated with stitching and embroidery for their source of living.

6.9 PUBLIC CONSULTATION

Locals of the project area were also consulted in order to consider their viewpoints regarding the proposed project, short interviews were made so as to extract positive as well as negative reviews regarding the proposed project. However it was noted that majority of the people had positive comments regarding establishment of proposed projects as this will provide new horizon for employment opportunities as there are number of skilled but jobless people in the area.

Exhibit 6.1: Socioeconomic features of the project area.

Well Being Indicator	Korangi Town
GPS Coordinates	24°47' 52.49" N 67° 06'23.13" E
Major Communities	Urdu-speaking, Pakhtoon, Sindhi, Baloch
No. of Houses	182168 approx.
Population (2014)	1,093,008 approx.
Livelihood	Transport, Labor, Millers, Shop keepers
Electricity	Available
Fueling Source	Available
Major Institutions	Iqra University, IoBM
Literacy Rate	Low
Drinking Water	Tankers system, groundwater, KWSB
Major Health Problems	Malaria, GIT, hepatitis and Lungs Diseases
Health Facilities	Fair
Major Hospitals	Indus Hospital, Korangi Eye Hospital, Jinnah Medical College Hospital
Major Needs	Govt. hospitals. Modern Schools, Safe Drinking Water, Continuous Electricity, Solid Waste and Wastewater Management System
Major Markets	Imtiyaz Supermarket
Transport	Public and Private Transport, Motorcycles, Rickshaws



ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

7.1 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the potential environmental and social impacts of the proposed activities, predicts the magnitude of the impact, assesses its significance and recommends mitigation measures to minimize adverse environmental impacts. The discussion starts with a description of the methodology used for the impact assessment. Discussion of the environmental and socioeconomic impact is then organized in the following manner:

- Impacts associated with construction phase
- Impacts associated with operational phase

7.2 IMPACT ASSESSMENT METHODOLOGY

Potential impacts from the proposed project activities were identified by review of the project activities, study of surrounding environment, review of literature, review of previous similar studies and expert judgment. Once potential impacts have been identified, the assessment of each potential impact follows these steps:

7.3 ENVIRONMENTAL IMPACTS ASSOCIATED WITH CONSTRUCTION AND OPERATIONAL PHASE

7.4 Land Use and Soil

Potential Issues

The proposed site for Construction of new building will not involve any mega impact on land as fabricated steel structure will be installed for developing building for facility for this few meter of land needed to be excavated for developing foundation ; therefore no potential issues were identified. However the impact may arise by leaching of oils& other lubricants etc to the soil, it should be noted that such kind of impact will only arise in case of spills or leakages of such lubricants and soil may get contaminated. Moreover, excavation activities for laying of foundations of building structure may result in soil erosion. During operational phase may not be adverse impacts on soil as facility doesn't include oil and diesel storage tanks.

Existing Conditions

The existing conditions are already discussed in Chapter 4.

Criteria for Determining Significance

There are no standards in Pakistan for maintaining the physical, chemical, or biological properties of soil. An adverse impact on the land will be interpreted if the land as a result of the project activities becomes unsuitable for the purpose for which it was originally intended.

Impact Analysis

The most significant impact will be the changes in the soil structure and degradation of soil quality as a result of erosion and compaction. Moderate amount of soil will be eroded during excavation and laying of foundations. However, cumulatively it is expected that there will be no significant impact on soil. The soil quality will be primarily checked by the contractors and civil works will be done accordingly. Quality of soil may be adversely impacted in case of accidental spill or leakages of oils and other lubricants.

On the other hand it is important to note, that the impact is only associated with construction phase which may include: excavation, accidental spillage of oils and other lubricants or chemicals used during construction phase

Mitigation Measures

- The construction activities will be planned to minimize disturbances to soil;
- Only limited area should be excavated which is required for laying foundation
- All possible chemicals, lubricants, adhesives, paints etc must be stored at an impermeable area where leakage or leaching in soil is completely ruled out;
- Use of such liquids will be monitored and recorded on site;
- Movement of heavy vehicles, which are expected to carry heavy machinery for proposed construction sites will be restricted to marked pathways only and unnecessary movements will be avoided to reduce soil disturbance;
- Regular inspections will be carried out to detect leakages in construction vehicles, equipment, and storage tanks;
- Appropriate arrangements, including shovels, plastic bags and absorbent materials, will be available near fuel and oil storage areas;
- Contaminated soil will be removed and properly disposed after treatment such as incineration or soil remediation technique etc.

7.4.1 Air Quality

The conditions that may alter air quality on temporary basis will only be limited to the construction phase; this may include dispersion of soil during excavation and compaction activity and gaseous emission from vehicles and machineries. Dust and gaseous emission during civil works are usually anticipated due to extensive nature of construction activities which include vehicular and material movements.

- **Particulate matter**

Dust emissions will cause Particulate matter to disperse in the environment. This may occur due to excavation activities, vehicular movement on unpaved areas and improper piling or stacking of raw materials.

- **Other Emissions:**

The loaders & lifters that are expected to be used in construction phase may result in gaseous emissions to air if not tuned or maintained properly. No extra Generator will be use during any phase; electricity will be used from self-generation capacity generators.

Existing Conditions

The existing ambient air quality has been discussed in **Chapter-4**.

Criteria for Determining Significance

There will be no long term significant impact on air quality. Since the proposed project does not included heavy construction activity and civil works will be completed within a limited time scale, as readymade steel building will be mounted on project site. In both construction and operational phase, a significant effect on the environment will be interpreted if there is an increase in visible dust or emissions beyond the boundaries of the proposed project site due to activities undertaken at site

Impact Analysis

Potential issues of particulate matter emission may arise from dust emission by Vehicle and machinery movement, excavation activity and compaction of land during construction phase. However during operation phase the generator will be the only source of gaseous emission.

Mitigation Measures

- Installation of proper exhaust systems and fans will be ensured prior to paint activities in order to reduce the exposure probability of VOCs in the ambient environment; this would also reduce the severity of health effects.
- Machineries involved in power generation should be tuned so VOCs maintained

- It should be ensured that all the vehicles, machineries and or generators that may be used in future will be properly tuned in order to reduce the probability of other emissions.
- Emission reduction techniques should be employed on a regular basis.
- Sprinkling of water on unpaved areas will be done so that less dust emissions are emanated from vehicular movement.
- Speed limits must be kept at minimum.

Residual Impacts

The effects of the VOCs and particulate matter nuisance are temporary with no long lasting impact expected after the completion of proposed project.

Monitoring Requirements

- Periodic monitoring of stack emissions from the generators will be carried out and recorded to ensure continued compliance with SEQS.

7.4.2 Noise Level

Depending on the construction equipment used and its distance from the receptors, the commuters travelling on the road and the nearby industries may exposed to intermittent and variable noise levels however the chances of locals getting exposed to noise is quite low since the project activities would only be limited within premises..

In general, human sound perception is such that a change in sound level of 3dB is just noticeable, a change of 5dB is clearly noticeable, and a change of 10dB is perceived as a doubling or halving of sound level.

Potential Issues

No potential issues are comprehended. However, noise levels during construction works might be elevated which may affect the workers themselves. Therefore, care must be taken during the works.

Existing Conditions

Furthermore, it is located in KCIP area where large spaces are provided between industries and no immediate communities exist which may be impacted from the noise.

Criteria for Determining Significance

The World Bank for noise guidelines requires that the sound level in industrial and commercial areas should not exceed 70dB (A). An alternate criterion is the World Health Organization (WHO) guidelines. The maximum noise level is important when there are distinct events to the noise. SEQS

levels for industrial zones vary 85 dB according to time of day. As far as SEQS limits for the time of night is vary 65 dB.

Impact Analysis

The cumulative effect of the baseline noise scenario that may be exhibited from project activities was only limited within the enclosed boundary. Moreover, during the operational phase the workers may get exposed to escalated levels of noise while working within the site.

Mitigation

The following mitigation measures are recommended in order not to further exceeding the noise due to construction activities:

- Use noise-abating devices wherever needed and practicable.
- Immobile machinery which may generate noise should be placed in enclosed rooms.
- It should be ensured that noise generating from one unit will be prevented by means of suitable noise absorbers such as UPVC doors (Unplastisized polyvinyl chloride) which reduces noise up to 75 dB (A)
- Vehicles must be tuned and maintained to reduce their noise levels.
- Civil works must be planned such that all works are in a sequence and no cumulative effect is formed which may escalate noise levels altogether.

Residual Impacts

If proper mitigation measures are followed the noise from the construction and operational activities is expected to be within the allowable, SEQS therefore no residual impacts are expected.

Monitoring Requirements

Periodic monitoring of noise level will be carried out and recorded to ensure continued compliance with SEQS.

7.4.3 Water sourcing

Water during the construction activity will be required for the concrete mixing and for wetting the fresh concrete structures etc. at the construction site as well as water sprinkling for dust suppression. The use of water for construction may affect water availability for other users if water is not taken from existing factory water supply. Moreover the leakages, spillages and improper handling of oil, lubricants and other solid hazardous waste may have adverse impact on underground water. To minimize these impacts following mitigation measures should be followed. However during the operational phase water may be used in electricity production processes.

Potential Issues

The use of water during construction phase will be limited to batching of construction material, sprinkling on materials and unpaved areas as well as for domestic use such as, cleaning, sweeping, ablution, and/or drinking purposes. The potential issue that may arise is unsustainable use of water on the other hand seepage of oil and lubricants from proposed project sites may result in ground water contamination.

Existing Conditions

The existing water resources of the proposed site and its surroundings have been discussed in Chapter-4.

Criteria for Determining Significance

An adverse impact on the water resources will be interpreted if it is established that the water use during constructions inflicts shortage in supply of KWSB& Tanker supply to the area.

Impact Analysis

The water requirement for the construction phase will not affect the water availability for other water users as most of the water will be taken from existing water supply and Ground water will augment its water supply to the area to cater for the water requirements of the project. Moreover adherence to the below mentioned mitigation measures will further ensure efficient use of water.

Mitigation

Following mitigation measures will be incorporated to minimize any impacts.

- A complete record of water consumption during construction and operational phase will be maintained;
- Water conservation program will be initiated to prevent wastage of water;
- The water supply lines will be checked and repaired for leaks in order to reduce wastage of water;
- Ensure that water efficient sanitary fittings are used throughout the development e.g. low flush toilets, efficient cleaning showers etc.
- Ensure that contractor will follow OGRA (NFPA 30) guidelines for construction of oil storage tanks to prevent any seepages or leakages.

Residual Impacts

Residual impacts are foreseen to be negligible / low in this case if recommended mitigation measures are adhered with.

Monitoring Requirements

- Water consumption during the construction and operational activities will be monitored and recorded.

7.4.4 Traffic***Potential Issues***

It is expected that traffic load will remain unaffected, during construction and operational phase as the project activities will be limited within the existing terminal premises.

Existing Conditions

The traffic is mainly comprised of cars, buses heavy trucks and tankers. The traffic flow is more or less uniform during the peak hours of the day for instance from 9:00am to 9:00pm. However there is a significant reduction in traffic at night with a minimum traffic flow occurring during the hours of 3:00am to 7:00am.

Criteria for Determining Significance

A significant impact will be interpreted if the additional operational phase traffic results in traffic congestion and becomes a hassle for the existing road users. But it is the industrial park of Karachi as traffic should be managed accordingly.

Impact Analysis

During the construction and operation phase the workers and laborers will use the following road networks, main Korangi Industrial Area (KIA) Karachi.

Mitigation Measures

The following mitigation measures will be incorporated to prevent traffic congestion:

- It should be ensured that employees park their vehicles within the parking area designated for parking within the industry to reduce the probability of traffic congestion and disturbance to the neighbouring industries.
- Designate construction vehicles to follow pathways and proper parking plans during complete construction phase.

Residual Impacts

Implementation of the proposed mitigation measures is not likely to leave any residual impact.

7.4.5 Wastewater Generation

Potential Issues

There will be almost no waste water associated with construction activities and operational phase. In addition to that no waste water will be produced during construction phase as there is no involvement of water use at any stage of construction. However waste water will be generated during operational process making sludge form & domestic activities only, including sewage water which is usually drained into sewage lines directly.

Criteria for Determining Significance

A significant impact on the environment will be interpreted if the wastewater discharged is not in compliance with the SEQS for municipal effluent if discharged offsite. Or improper discharge onsite causes odour nuisance, and health hazard.

Impact Analysis

The source of wastewater will include toilets, power plant process & washrooms. The collected sewage generally consisting of sanitary & Sludge wastewater will be routed to a municipal drain/sewerage system.

Mitigation Measures

The following mitigation measures will be taken:

- Wastewater generated should be routed to industrial park waste water treatment plant.
- Proper channel and pipeline must be used for drainage of waste water.
- Takes action if the generated waste water is not met the SEQs limits, then needs to install WWTP or ETP.

Residual Impacts

Implementation of the proposed mitigation measures is not likely to leave any significant residual impacts.

Monitoring Requirements

Monitoring is required in this case the generated waste water are heavy pollution load in water bodies.

7.4.6 Solid Waste Generation and Management

a. Solid Waste Generation and Management during Construction Phase

Potential Issues

The construction phase of the proposed project is expected to generate wastes including; packing waste; scrap, excess construction materials and debris, empty containers and drums, used lubricating oils, Sludge, and chemicals etc. Besides being an eyesore, the waste can also pose a health hazard; pollute soil, surface and ground water if disposed of improperly.

Criteria for Determining Significance

A significant impact will be interpreted if the waste management is not carried out properly during installation and operational phase; which may effect to health of workers, pollution of soil, surface or groundwater:

- Excessive wastes are generated, recyclable waste is not recycled, waste are scattered, handling of wastes results in contamination, and wastes are improperly disposed of causing pollution.

Impact Analysis

Majority of the construction material to be used and waste generated as a result of construction activity will be inherently less reactive and chemically inert under normal conditions however, its handling and storage may pose adverse impacts of minor nature which could easily be controlled by employing the recommended mitigation measures in this report.

Waste from construction and associated activities by all the project contractors will be properly managed by proposed controls discussed in the following section.

Mitigation Measures

A waste management plan will be developed before the start of the construction activities. Key elements of the waste management system will be the following:

- Separate bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton;
- Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling;
- No waste will be dumped at any location outside the proposed site boundary;
- All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. Hazardous wastes will be disposed of through approved waste contractors;
- Surplus construction materials including partially filled chemical and paint containers will be returned to suppliers. Inert construction wastes will be sold as scrap to contractors;

- Record all waste generated during the construction period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register;
- Training will be provided to personnel for identification, segregation, and management of waste.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from waste is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

The monitoring measures will include:

- The proposed construction site will be periodically inspected to verify that no project related waste is scattered in these areas.
- Waste management inspection will be undertaken on a regular basis of on-site waste management and of waste disposal contractors to ensure that the waste management procedures are being followed.

b. Solid Waste Generation and Management during Operational Phase.

Potential Issues

The solid waste generated during operational phase will be hazardous in nature.

Criteria for Determining Significance

A significant impact will be interpreted if the waste management is not carried out properly; which may affect the health of employees, pollution of soil, surface or groundwater, excessive wastes are generated, recyclable waste are not recycled, waste are scattered and not segregated, handling of wastes results in contamination, and wastes are improperly disposed off causing pollution.

Impact Analysis

The solid waste generated can again be categorized as hazardous. The former type will mainly consist of

- Waste generally comprising of Sludge, Luboil, Exhausted Gas, chemical bags, metal sheets, empty chemical drums and cans etc. This waste should be segregated at source.

The non-hazardous waste would mainly consist of:

- Packaging materials, plastic wrappers etc.
- The type of non-hazardous waste will be transported to specialized facilities/waste contractor for recycling.

Mitigation Measures

- Waste generation will be minimized by adopting waste management strategy of reduce, reuses and recycle.
- A waste management plan will be prepared, implemented and monitored for the safe collection, storage and disposal of solid waste.
- Records of all waste generated will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register.
- Training will be provided to personnel for identification, segregation, and management of waste.
- All inert and non-hazardous wastes will be disposed to the existing tipping sites within or outside of the city limits.
- Waste storage areas should be located within the facility and sized to the quantities of waste generated.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from waste is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

Waste management inspections will be undertaken on a regular basis of on-site waste management and of waste disposal contractors to ensure that the waste management procedures are being followed.

7.4.7 Disturbance to Wildlife

As the proposed project site is present in an already urban developed area with minimal presence of wild life, therefore no significant impacts are envisaged on the wildlife during the construction and operational phase.

7.4.8 Socio-economic Impacts

a. Employment and Business

The proposed development will create employment during its construction and operational phase. During construction of proposed project, about 50 to 100 people are expected to be employed. The

proposed development will create employment opportunities for some 20 professionals and other supporting staff.

Most of the workforce will consist of local people. The generation of employment is likely to be another major beneficial impact arising from the proposed project during both construction.

b. Cultural Resources

There are no protected or otherwise cultural or archaeological sites within the premises of the proposed project site and hence no impact of the proposed project will occur on cultural or archaeological resources.

Mitigation Measures

- Designated parking areas will be provided for different type of project vehicles within and around are project site;
- Employment preference will be given to the locals;
- Local contractors will be given preference for hiring equipment and machinery during construction/ operation;
- Ensure maximum quantity of water to be treated in order to lessen its burden on the existing sewerage system;
- Locals, surrounding businesses, city government are kept on the same page during all stages of the development of the project;
- A complaint register will be maintained on site during construction and operation to record complaints of the nearby residents.
- It must be ensured that there is proper arrangement of reaching upto the top level in case of fire and extinguishing it.

7.4.9 Health and Safety

Potential Issues

The construction Phase and operational phase expected the major or minor incident in the depot premises. In addition for the operational phase fire hazard, dispersion of volatile substance in ambient environment as well.

Criteria for Determining Significance

A significant impact will be interpreted if the procedure and training is not given to employee properly; which may affect the Safety of employees. Prior to any site works, the proponent and contractor will develop a construction and operation management and waste management plan.

Such plans will be reviewed and approved by the proponent, and their implementation will be monitored by third party consultants and relevant authorities.

Impact Analysis

During construction activities the worker safety affected when the heavy machineries work on the project site. Employee's health issues related to suffocation, headache, irritation & respiratory disorders due the contamination of ambient environment. The contractor will ensure that activities at the site will not cause damage to lives and properties by implementing the following measures to ensure the health and safety of workers and the public.

Mitigation Measures

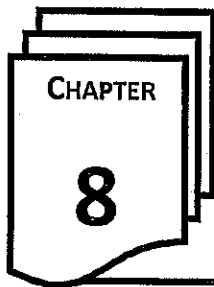
- Only skilled workers will be allowed to work during construction and operation activities.
- Activity areas will be fenced to avoid accidents and will be properly drained to avoid ponding of water that could harbor mosquitoes and other disease vectors,
- A proper fire safety system should be installed.
- Basic medical facilities and appropriate safety gear will be provided to workers.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from any Accident to risk is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

Safety inspections will be undertaken on a regular basis of on-site. Ensure the health & safety procedure. Fire precaution and extinguisher are up to date and randomly monitor, Safety guideline & procedures are being followed by the employee to save work practice.



ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

8.1 GENERAL OUTLINE AND SCOPE

The potential environmental impacts during the construction and operation phase proposed project on various environmental components of project surrounding such as social, biological and physical environment were predicted in the course of this IEE study. This IEE has also identified mitigation measures to minimize the environmental impacts of the proposed project, keeping these effects within acceptable limits.

The Environmental Management and Monitoring Plan (EMMP) has been designed to address how the proposed measures will be implemented. It defines the responsibilities of the project developer and contractor; develops a system of checks and balances; proposes actions that are to be taken by each role player; and lays down the required documentation, communication, and monitoring procedures.

8.2 PURPOSE AND OBJECTIVES

The purpose of this EMMP is not only to address the expected environmental impacts of the proposed project, but also to enhance project benefits and to introduce standards of good practice to be adopted for the proposed project.

The primary objectives of the EMMP are to:

- ❖ Facilitate the implementation of the mitigation measures that are identified in this IEE;
- ❖ Define the responsibilities of the project proponent and contractor and to provide a means for effective communication of environmental issues between them;
- ❖ Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- ❖ An Integrated Environment Management System play important role in sustainable industrial development if their Environment Management and Monitoring Plan is more effective and economically beneficial covering all activities of the industry and give proper implementable guidelines.

8.3 APPROACH

An Integrated Environment Management System play important role in sustainable industrial development if their Environment Management Plan is more effective and economically beneficial covering all activities of the industry and give proper implementable guidelines. The EMMP prepared

specifically for the activities of the proposed project for construction and operation which has been presented in Exhibit 8.1.

Exhibit 8.1: Environmental Management Plan

Aspect	Impact	Mitigation/Safeguards	Monitoring/Responsibility
Construction Phase			
Topography and Land Use Pattern	<ul style="list-style-type: none"> - Accidental spillage of oils and other lubricants or chemicals and leachate discharge from concrete mixing may impact the soil. 	<ul style="list-style-type: none"> - Proper site leveling will be ensured and will be restricted to the designated boundaries - Ensure that excavation and other earth works will be limited to proposed construction area; no extra area will be excavated or degraded. - A construction activity must be planned to minimize the disturbance to soil. - Concrete mixing or other liquid activities must be done on impermeable floor to prevent the contamination to soil and ground water - Regular inspections will be carried out to detect leakages in construction vehicles, equipment. - Ensure that lubricants and oils will be stored properly, having impermeable floors to reduce the probability of leaching of these lubricants into the soil. 	Contractor
Site Aesthetics	<ul style="list-style-type: none"> - Scattered construction material and residue may affect the site aesthetics. 	<ul style="list-style-type: none"> - Construction waste and residue will be stored at a designated area till its final disposal. Residual waste from construction will not be allowed to be disposed at open land and outside the storage area. - Proper housekeeping is to be ensured during project activities. 	Contractor/PSPL

		<ul style="list-style-type: none"> - The proponent will maintain an inventory of waste produced and disposal. - A designated area should be allocated for storage of construction material, residue and waste with separate storage areas. 	
Biological Environment	<ul style="list-style-type: none"> - Cutting of trees may result in ; - Ecological disturbance - Loss of habitats for birds 	<ul style="list-style-type: none"> - Ensure that no extra trees are cut or cleared during construction or mobilization of machineries. - Green belt should be provided and maintained - Re-plantation of trees is recommended by ratio of 1:5 for young trees and 1:10 for mature trees. 	Contractor/PSPL
Air Quality	<ul style="list-style-type: none"> - Elevated levels of air pollution may result in following impacts: - Respiratory diseases and other health impacts. 	<ul style="list-style-type: none"> - Water spray will be used to control dust generation caused by earth disturbance activities and materials used during construction works, as well as the transit of heavy equipment - All the dusty material should be sprayed with water prior to loading unloading and transfer to control. - Ensure the timely maintenance and Use of standard construction equipment and vehicles; - Scheduled maintenance of equipment and vehicles including engine tuning in order to reduce the probability of other emissions. - The accumulation of loose material in areas susceptible to strong wind currents for long periods of time will not be allowed - A plan must be devised to make daily inspections to assure the implementation of preventive measures to control 	Contractor/PSPL

		<p>fugitive dust. Compliance with these measures will be confirmed at end of each work week.</p> <ul style="list-style-type: none"> - The vehicle speeds on graded roads will be limited in order to minimize dust emissions. - Cordon of the construction sites to reduce the probability of fugitive emissions. 	
Noise Levels	<ul style="list-style-type: none"> - Elevated levels of noise may result in following impacts: - Headaches, - Hearing loss in severe conditions, Anxiety, - Accumulation of stress hormones and hypertension. 	<ul style="list-style-type: none"> - Use noise-abating devices wherever needed and practicable. - Construction equipment/machineries will be provided with suitable noise dampening systems to minimize noise at source; - The construction activities will be scheduled / planned in such a way to compliance with SEPA guideline 85 dB during daytime and 75 dB during night time. - Ensure that workers involved in construction activities provided with appropriate PPEs in order to reduce exposure of noise 	Contractor/PSPL
Water Sourcing and Quality	<ul style="list-style-type: none"> - The leakages, spillages and improper handling of oil, lubricants and other liquid waste may impact the underground water. 	<ul style="list-style-type: none"> - A complete record of water consumption during construction will be maintained; - Water conservation programme will be initiated to prevent wastage of water; - The water supply lines will be checked and repaired for leaks in order to reduce wastage of water; - Ensure that water efficient sanitary fittings are used throughout the development. 	Contractor/PSPL

Traffic and Transport	<ul style="list-style-type: none"> - The impact may arise due to increased load on existing roads networks. Chances of accident exist in case of mismanagement. 	<ul style="list-style-type: none"> - Proper traffic system should be devised according to the number of vehicle and its movement in site to reduce the probability of traffic congestion - Proper parking area must be allocated for parking of vehicles. - Adequate warning signs in both directions will be provided at the approaches to road crossings 	Contractor/PSPL
Health & Safety	<ul style="list-style-type: none"> - Untrained workers may cause harm to themselves as well as others and lead to accidents - Improper Construction activities may include many risks and hazards that may lead to severe injuries 	<ul style="list-style-type: none"> - Basic medical facilities, first aid facilities and appropriate safety gear will be provided to workers - Emergency response training should be given to employees and evacuation drills should be scheduled and conducted - Emergency response plan emergency evacuation plan, Emergency fire drill and firefighting plan must be developed - Unauthorized personnel will not be allowed to access the proposed project site without permission and safety permits. - Workers should be facilitated by providing appropriate work specific PPE's; - Use of signage must be implemented. - Detailed risk assessment will be carried out. 	Contractor/PSPL
Solid Waste Disposal	<ul style="list-style-type: none"> - Poor practice solid waste management may result in leachates formation which may contaminate ground 	<ul style="list-style-type: none"> - Grey water and residue from construction activity should be reused i.e. site levelling. - Hazardous and chemicals must be disposed off by SEPA certified contractor 	Contractor/PSPL

	<ul style="list-style-type: none"> - water, produce nuisance & adverse aesthetic view - Environmental pollution and health hazard due to disease causing vector 	<ul style="list-style-type: none"> - Separate bins will be placed for different type of wastes. - Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling; - No waste will be dumped at any location outside the proposed site boundary; - All hazardous waste such as paint will be separated from other wastes. - Surplus construction materials including partially filled chemical and paint containers will be returned to suppliers. - Record of all wastes generated during the construction period will be maintained. 	
OPERATION PHASE			
Air Quality	-	-	
Noise Levels	<ul style="list-style-type: none"> - Elevated levels of noise may result in following impacts - Headaches - Hearing loss in severe conditions, Anxiety, - Accumulation of stress hormones and hypertension. 	<ul style="list-style-type: none"> - Use noise-abating devices wherever needed and practicable. - Ensure that workers involved in operation of metal recycling process and machinery works are provided with appropriate PPEs in order to reduce exposure of noise. - Operation of multiple high noise equipment will be avoided to the extent feasible to prevent high noise activities during night times. 	PSPL
Water Quality	<ul style="list-style-type: none"> - Wastage and misuse of water may impact the water availability. 	<ul style="list-style-type: none"> - A complete record of water consumption during operational phase will be maintained; - Water conservation programme will be initiated to prevent wastage of water; 	PSPL

		<ul style="list-style-type: none"> - The water supply lines will be checked and repaired for leaks in order to reduce wastage of water; - Ensure that water efficient sanitary fittings are used throughout the development e.g. low flush toilets, efficient cleaning showers etc. 	
Health & Safety	<ul style="list-style-type: none"> - Improper protocol for health and safety may cause serious injuries and incident - Health hazards due to the exposure of high noise level in the operational area 	<ul style="list-style-type: none"> - Detailed risk assessment will be carried out. - Provision of first aid facilities for workers at site for meeting the emergency needs of workers; - Emergency evacuation plan emergency response plan emergency drill plant emergency firefighting plan must be implemented - Emergency response training should be given to employees and evacuation drills should be scheduled and conducted - Workers should be facilitated by providing appropriate PPE's; which is standard for metal recycling facility - OSHA standard of health and safety for metal recycling facility must be developed and implemented 	PSPL
Solid Waste Disposal	<ul style="list-style-type: none"> - Unattended and improper storage of solid waste can create unaesthetic and unhygienic condition of the site 	<ul style="list-style-type: none"> - Dumping of solid waste will be prohibited around the facilities. - Hazardous and chemicals must be disposed off by SEPA certified contractor. - Ensure the implementation of solid waste management plan for recyclable and non-recyclable waste, - Record of all wastes generated during the operational period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking 	PSPL

	Register;	
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Exhibit 8.2: Environmental Monitoring Plan

Aspect	Impact	Mitigation	Monitoring Parameter	Location	Monitoring	Frequency of Monitoring	Responsibility
Air	Chronic health affects Reduced visibility on roads	Sprinkling of water Tuning of construction vehicles & machines Dust masks for labor	Particulate Matter CO SOx NOx	generator and vehicles	Exhaust emission Dust Ambient air quality	Monthly for emissions and daily for dust	PSPL Contractor
Noise	Stress Hypertension Hearing loss Headache	Avoid working at night Schedule the work plan to reduce the elevated noise level as per SEPA guideline i.e.80 dB during day time &65 dB during night time. PPes	Noise level	7.5m away from source	Noise Level Meter	Continuous	Contractor PSPL

Land and soil	Soil erosion/ degradation	Water sprinkling, stone pitching, reusing native excavated soil	Surface topography	Project site	Visual assessment Photographic evidences	From beginning till completion of project	Contractor PSPL
Vegetation	No cutting of trees is involved	Avoid unnecessary cutting of trees In case of cutting of trees, one plant should be replaced by 6 plants	No of trees cleared or cut Ensure re- plantation by 1:10 for mature plant & 1:5 for immature plant	Project vicinity and access route	Visual assessment Photographic evidences	From beginning till operational phase	PSPL
Water	Wastage and misuse of water Contamination of water Leachates	Avoid un necessary use of water Prevent leakages Treatment of Waste Water	Water supply and use	Project site	Visual assessment Record log of water usage	From beginning till the end of project	PSPL Contractor
Social Environment	Difference of opinion between contractor laborers and permanent employees	Specify time scale for construction activities Trainings of all personnel including contractor, laborers and permanent	Regular training sessions and tool box meetings	Project site	Review of training schedule	Daily	PSPL

		employees involved in the project Maintain the complaint register and take actions of serious concern of stakeholder					
Roads and networks		Traffic congestion	Signs & symbols are being followed Movement of vehicles is under safe construction practices	Signs and detours are being followed	Project Site	Visual Observations	Weekly Contractor
Health and safety		Lack of awareness to visitors about safety may lead to accidents Incompetent and untrained workers might cause harm to themselves and others Construction works may include many	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work It is recommended to develop and implement the plan of health and safety, emergency	Safety precautions Use of PPEs	On all project sites	Tool box talk Risk assessment Record of PPEs, incidents, accidents and hazards	Daily Contractor PSPL

	risks and hazards that may lead to injuries or even death	evacuation and fire drills should be performed. Appropriate PPEs must be provided					
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Financial Analysis & Tariff



YEAR #	YEAR	ENERGY PRICE Rs. / Kwh		
		Fuel	Variable O & M	TOTAL Rs.
1	2012	4.072	0.815	4.888
2	2013	4.072	0.815	4.888
3	2014	4.072	0.815	4.888
4	2015	4.072	0.815	4.888
5	2016	4.072	0.815	4.888
6	2017	4.072	0.815	4.888
7	2018	4.072	0.815	4.888
8	2019	4.072	0.815	4.888
9	2020	4.072	0.815	4.888
10	2021	4.072	0.815	4.888
11	2022	4.072	0.815	4.888
12	2023	4.072	0.815	4.888
13	2024	4.072	0.815	4.888
14	2025	4.072	0.815	4.888
15	2026	4.072	0.815	4.888
16	2027	4.072	0.815	4.888
17	2028	4.072	0.815	4.888
18	2029	4.072	0.815	4.888
19	2030	4.072	0.815	4.888
20	2031	4.072	0.815	4.888
21	2032	4.072	0.815	4.888
22	2033	4.072	0.815	4.888
23	2034	4.072	0.815	4.888
24	2035	4.072	0.815	4.888
25	2036	4.072	0.815	4.888
26	2037	4.072	0.815	4.888
27	2038	4.072	0.815	4.888
28	2039	4.072	0.815	4.888
29	2040	4.072	0.815	4.888
30	2041	4.072	0.815	4.888

	levelized tariff over 10 years;	levelized tariff over 20 years	levelized tariff over 30 years
100%	0.0678	0.0678	0.0678
90%	0.0678	0.0678	0.0678
80%	0.0678	0.0678	0.0678
70%	0.0678	0.0678	0.0678
60%	0.0678	0.0678	0.0678
50%	0.0678	0.0678	0.0678
40%	0.0678	0.0678	0.0678
30%	0.0678	0.0678	0.0678
20%	0.0678	0.0678	0.0678
10%	0.0678	0.0678	0.0678
0%	0.0678	0.0678	0.0678

[illegible]

Rs.
8.164
6.959
6.557

[illegible][illegible]

Cents
8.331
7.101
6.691

USD Rate	98.00 Rs./US\$
	0.00

8.164



MAIN PROPOSAL 3 TRAINS 2 GTG's + 2 WHRB's + 1 STG

Basic Parameters

Total Gross Power Generation	53,474	KW
Total Capacity of Plant at 95%	50,800	KW
Aux. Consumption %	4.72	%
Capacity of Plant Available	48,400	KW
Load Factor (LF)	93	%
Hours In a Day	24.0	Hrs
Days In A Year	360	Days

NARRATION

120 hours considered for forced

Total Generation per day @ 100 % LF	1,219,200	KWH
Total Generation per Month	36,576,000	KWH
Total Generation per Year	438,912,000	KWH

Aux. Consump.	2,400	KWh
Aux. Consumption per Day	57,595	KWh
Aux. Consumption per Month	1,727,850	KWh
Aux. Consumption per Year	20,734,203	KWh

Total Generation per day @ 93 % LF	1,133,856	KWh
Total Generation per Month	34,015,680	KWh
Total Generation per Year	408,188,160	KWh

Aux. Consump.	2,400	KWh
Aux. Consumption per Day	53,563	KWh
Aux. Consumption per Month	1,606,901	KWh
Aux. Consumption per Year	19,282,809	KWh

Net Saleable -kWh	388,905,351	
Capital Cost Local	207,532,213	
Capital Cost Foreign	6,710,208,227	

	70.58919	14.12	
TOTAL CAPITAL COST	70589188	6,917,740,440	Rs
Equity %		20%	

Revised current exchange rate
Revised capital expense from:
6,569,944,036.00

Equity	1,383,548,088	Rs
Bank Loan	5,534,192,352	Rs
KIBOR	11%	
LIBOR	0%	

Revised from KIBOR - 13%
Revised from LIBOR - 7%

Return on equity	14%	
Return per year	193,696,732	Rs
Return per year / KWH	0.475	@ 95 %

Insurance Rate	1.100%	
Insurance Cost per Year	76,095,145	Rs

Instalment to be paid back in Years	10	Years
-------------------------------------	----	-------

First Year Interest	608,761,159	Rs.
First year Instalment without interest	330,952,600	Rs.

Gas Purchase Price	15.72	Per m3
Full Load Gas Consumption (at 95%) Per Hr	12,499	m3/Hr
Full Load Gas Cost (at 95%) Per Year	1,662,283,607	Rs
Full Load Gas Quantity (at 95%) Per Year	105,743,232	m3/year

Revised from 12.50 Rs/m3

FIXED MAINT. COST (Major/minor) / YEAR	0
FIXED MAINT. COST (Major/minor) / MONTH	0



FIXED OPERATING PERSONNEL

(To be included in Capacity Purchase Price)

	QTY.	SALARY / MONTH Rs.	AMOUNT PER MONTH Rs.
1 CHIEF ENGINEER	1	180,000	180,000
2 DY. CHIEF ENGINEER	1	100,000	100,000
3 MAINTENANCE ENGINEER	1	60,000	60,000
4 BOILER ENGINEER	1	60,000	60,000
5 SHIFT ENGINEER	4	60,000	240,000
6 CHEMIST	1	40,000	40,000
7 SHIFT MECH. SUPERVISOR	2	30,000	60,000
8 SHIFT ELECT. SUPERVISOR	2	30,000	60,000
9 SHIFT INST. & CONT. SUPERVISOR	4	30,000	120,000
10 OPERATORS	20	20,000	400,000
11 MECH. FITTERS	6	30,000	180,000
12 I & C FITTERS	6	30,000	180,000
13 ELECTRICIANS	12	30,000	360,000
14 HELPERS ELECT.	9	10,000	90,000
15 HELPERS MECH.	9	10,000	90,000

AMOUNT PER MONTH 79 2,220,000

TOTAL AMOUNT PER YEAR 26,640,000

OPERATING PERSONNEL

(To be included in Variable O & M cost: EPP Price)

Labour for General Cleaning	10	7000	70,000
TOTAL COST PER MONTH			70,000
TOTAL COST PER YEAR			840,000

FIXED ADMINISTRATIVE COST

(To be included in Capacity Purchase Price)

Accountant	1	35000	35,000
Dy. Accountant	1	25000	25,000
Administrative Officer	1	25000	25,000
Store Keeper	1	15000	15,000
Store Man	2	8000	16,000
Office Clerks	3	6000	18,000
Security Personnel	8	7000	56,000
Drivers	2	8000	16,000
Peons	2	7000	14,000
Office Supplies & Support	1	20000	20,000
TOTAL COST PER MONTH			240,000
TOTAL COST PER YEAR			2,880,000

FIXED MAINT. COST (Major/minor) / YEAR 0
FIXED MAINT. COST (Major/minor) / MONTH 0

VARIABLE O & M Cost

(To be included in Energy Purchase Price)

Operating Personnel Cost	Yearly 840,000	0.0021	Rs. / KWH
Lubricant Cost	24,940,297	0.0611	Rs. / KWH
Routine Maint. & Spares Cost	285,446,590	0.7238	Rs. / KWH
Chemical & Water Cost	11,582,544	0.0284	Rs. / KWH

Total Variable O & M Cost 332,819,431 0.8154 Rs. / KWH

ESCALABLE FIXED COMPONENTS

PER MONTH EXPENSES

(To be included in Capacity Purchase Price)

FIXED OPERATING PERSONNEL	36,457,840	0.087	Rs. / KWH
ADMINISTRATIVE COST	3,833,280	0.009	Rs. / KWH
INSURANCE	101,282,838	0.248	Rs. / KWH
FIXED MAINT. COST (Major/minor)	0	0.000	Rs. / KWH
RETURN OF EQUITY - (Profit)	213,086,406	0.522	Rs. / KWH

TOTAL EXPENSES/ month 353,840,163 0.866 Rs. / KWH

NON-ESCALABLE FIXED COMPONENTS

INTEREST COST 608,761,159 1.491 Rs. / KWH

FUEL COST

(To be included in Energy Purchase Price)

Cost per unit (Nett) 1,662,263,607 4.07 Rs. / KWH

TARIFF COMPONENTS

24th April 2013

EPP (ENERGY PURCHASE PRICE)		CPP (CAPACITY PURCHASE PRICE)		PASS THROUGH ITEMS
Fuel Cost		Escalable Component	Non-Escalable Component	- Variation in Fuel Price - Actual payment to workers welfare or Profit Participation Fund - Taxes, Levies, Govt. Charges - Expenditure on modification, Expansions of Protective devices requested by WAPDA
Variable O & M				
4.072 - FUEL COST	0.0021 - OPERATING PERSONNEL 0.0611 - LUBRICANTS COST 0.7238 - ROUTINE MAINT. & SPARES COST 0.0284 - CHEMICAL & WATER	0.087 - FIXED OPERATING PERSONNEL SALARIES 0.009 - ADMINISTRATIVE COST 0.248 - INSURANCE 0.000 - FIXED MAINT. COST (Major/minor) 0.522 - RETURN OF EQUITY - (Profit)	0.8510 Loan Repayment 1.5653 Interest	
<u>4.072</u>	<u>0.8154</u>	<u>0.866</u>	<u>2.416</u>	
<u>4.072</u>	<u>0.815</u>	<u>0.866</u>	<u>2.416</u>	

TARIFF:	Rs.	Cents	
FIRST YEAR	8.170	8.337	98 Rs./US\$ USD Rate JPY Rate EUR Rate
LEVELIZED TARIFF OVER:			1.05 132.68
10 Years	8.164	8.331	
20 Years	6.959	7.101	

Tariff Rate Components

15-Oct-2010 15-Jan-2013

Energy Purchase Price

Fuel Cost	3.307	4.156
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Variable O&M

Operating Personnel	0.001	0.001
Lubricant Cost	0.053	0.053
Routine Maintenance & Spares	0.619	0.641
Chemical & Water	0.021	0.021

Capacity Purchase Price**Escalable Component**

Fixed Operating Personnel	0.063	0.065
Administrative Cost	0.007	0.007
Insurance	0.171	0.186
Fixed Maintenance Cost	0.000	0.000
Return on Equity	0.466	0.508

Non Escalable Component

Loan Repayment	0.892	0.701
Interest	0.893	1.898



RE-PAYMENT SCHEDULE

NIP 48 MW Combined Cycle BOO Project

MAIN PROPOSAL OPTION 1

Total Loan Principal	5,534,192,352	
Down Payment		
Financing Amount	5,534,192,352	
KIBOR rate	11%	100%
LIBOR Rate	0%	0%

Financing Period	10	10
------------------	----	----

Sr. No.	Due Date	Principal Outstanding	I n s t a l m e n t A m o u n t			Principal Outstanding
			Principal	Markup	Total	
1		5,534,192,352	330,952,600	608,761,159	939,713,759	5,203,239,752
2		5,203,239,752	367,357,386	572,356,373	939,713,759	4,835,882,366
3		4,835,882,366	407,766,699	531,947,060	939,713,759	4,428,115,667
4		4,428,115,667	452,621,036	487,092,723	939,713,759	3,975,494,631
5		3,975,494,631	502,409,350	437,304,409	939,713,759	3,473,085,281
6		3,473,085,281	557,674,378	382,039,381	939,713,759	2,915,410,903
7		2,915,410,903	619,018,560	320,695,199	939,713,759	2,296,392,343
8		2,296,392,343	687,110,601	252,603,158	939,713,759	1,609,281,742
9		1,609,281,742	762,692,767	177,020,992	939,713,759	846,588,975
10		846,588,975	846,588,972	93,124,787	939,713,759	3

5,534,192,349	3,862,945,241	9,397,137,590
(3.00)		



Basic Parameters Applied

Based on the Concession Agreement dated Jan 2014, following parameters have been applied in order to perform the tariff calculations. The exchange rate of USD 1= Rs. 98 (as per bid) has been applied (prevailing at that time). The Concession Agreement has established a project cost of Rs 6,917,740,440 translating into a cost of USD 70.589 million.

Operations & Maintenance Cost including Insurance

A budget allocation Rs. 0.8154/kWh as Variable O&M, Rs. 0.087/KWh for personnel, Rs. 0.09/kWh for insurance and Rs. 0.248/kWh for insurance has been considered in tariff

Interest Rate

An interest rate of KIBOR+3% has been applied. KIBOR value considered is 8%. This results into effective interest rate of 11% p.a. Loan repayment is considered biannually. The debt repayment period is 10 years. Debt is considered 80% of CAPEX

Tariff

The levelized tariff of US 6.6911/KWh comprising of US Cents 4.07 /KWh as fuel cost. This tariff is very attractive and provides the end consumer much relief in terms of electricity bills with reliable power supply on uninterruptible basis

Prospectus

Power Station (Pvt) Limited

Power Station (Pvt) Limited a Special Purpose Vehicle incorporated under Companies Ordinance 1984 . The company is incorporated to undertake the development, financing, construction, operation and maintenance of Combined Cycle Power Plant at Korangi Creek Industrial Park (KCIP) developed by National Industrial Parks Management Company Limited , a company of Ministry of Industries & Production, GoP.

Power Station (Pvt) Limited is a subsidiary of IMS Engineering (Pvt) Limited, who have won the concession award by NIP to develop a combined Cycle Power Station at KCIP under the Concession Agreement .

Sponsors Introduction

IMS Engineering (Pvt.) Ltd was established as a registered partnership firm, in 1996, to undertake instrumentation & process management works. Pioneering innovations in fields of power generation, large scale engineering, fabrication, building management and sustainable solutions. IMS Engineering is consistent in delivery of quality solutions for governmental, commercial and industrial organizations has awarded us a reputation of being reliable partners to our clients.

IMS Engineering has been taking a leading role in providing general contracting services with uncompromised commitment to Quality, Health, Safety and Environment. We do this through the combination of an open relationship with our employees based on mutual trust, transparency, accountability and discipline.

Ultimate goal is ensuring continued precision in everything we do. Being a vertically integrated engineering and Power Company, we are committed to provide the best economical and technical solutions for our valued customers.

We are proud of our achievements to date and we are committed to continually enhancing our capabilities to ensure we remain at the forefront of our industry both in terms of client and project needs.

Management Team:

- **Mr. Mahmoud Ul Haq** : The Managing Director is assisted in day to day business by his son who joined the business in 1997 a few years back after completing his business studies in USA. Mr. Mahmoud is a forward looking individual with a vision of IMS Engineering as a single window Engineering EPC operator .
- **Mr. Nisar Ahmad** : Director Projects Engineering Division at the Head Office in Karachi. He is a key resource and has a long standing with the Company. The projects all over the country report to him on technical matters.

- **Mr. Faisal Abbasi** : Head of Finance Division. He consolidates the financial activity of the on-going projects in the country and keeps a track of budget. Preparing financial reports, follow up of account receivables and discussion with the senior management is done on monthly basis. He is the company's contact person with external auditors for smooth audit and timely preparation of annual accounts.

Mr. Tariq Mahmood : General Manager Projects of Power Generation. He is a long serving employee of the company and headed in the field of Power Generation for 14 years

Project Investment Overview

Capital Cost (USD million)	70.589
Debt (USD million)	56.48
Equity (USD million)	14.12
Debt	80%
Equity	20%
Debt repayment period (years)	10
Expected Unit Rate for end consumer	10% less than KESC tariff rate
Levelized Tariff	US Cents 6.69/kWh

Operating Parameters

Gross ISO Capacity	60240 kWe
Installed Capacity (MSC)	53,406 kWe
Parasitic Load	2406kW
Power available for 100 load factor	51000 kW
Saleable power at 95% availability	48400 kW
Net saleable , 93 Lf , 360 days , 24 hrs/day	388,905,351 kWh
(After adjusting for auxiliaries)	

Financial Highlights

Rate of Return ROE	14%
Levelized Tariff	US Cents 6.691/kWh
Fuel Cost	US Cents 4.1/kWh (Rs. 4.07/kWh)
Exchange rate of BOT bid	USD 1= Rs. 98

Contractual Arrangements

Mode of Implementation	BOT under the Concession Agreement signed between NIP and PSPL
Gas Supply Agreement (GSA)	Signed between NIP and SSGC
Gas Quantity	9.7 MMSCFD
Power Purchaser	NIP
End Consumer	Industrial Units at Korangi Creek Industrial Park

Plant Overview

KCIP plant shall be a Gas Turbine based combined cycle plant, consisting of 3 blocks with each block having the following configuration

2 Gas Turbines (Each 7530 KW ISO, 6070 KW MSC) +1 Steam turbine (4800 KW MSC)

Voltage 11 kilo volts

Frequency 50 Hz

Fuel Specification

Gas Fuel

Natural Gas

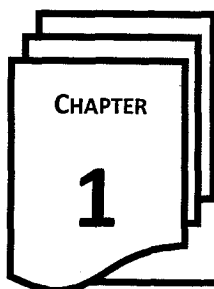
LHV 8,000 kCal/Nm³

- Density 0.7974 kg/Nm³
- Supply Pressure 3 psig
- Supply Temperature 10 deg C above dew point

Environment & Social Impact

The project is part of the Korangi Creek Industrial Park . The Project would provide the most efficient , environment friendly electric power to the industrial units in the Industrial Park because of its very high efficiency (more than 51%) , thus adding least possible pollutants to environment. The facility would strictly comply with National Environment Quality Standards (NEQs) as required under the approval accorded by Sindh Environmental Protection Agency (SEPA)

Initial Environmental Examination Report



INTRODUCTION

1.1 BACKGROUND INFORMATION

Study Type	Initial Environmental Examination (IEE)
Client Name	IEE for Power Station Pvt Limited
Location	Korangi Creek Industrial Park (KCIP)
Project Name	Power Station (Pvt) Limited, Sponsored by I&MS Engineering (Pvt) Limited
Study Area	Global Environmental Management Services (Pvt) Limited (GEMS)

An Initial Environmental Examination (IEE) was carried out by GEMS, for M/s Power Station Pvt Limited for their NG based 48 MW Power Generation facility to KCIP and different industries developing in the existing premises, Karachi as per legislative requirement under Sindh Environmental Protection Agency (SEPA) Act 2014. This IEE report is consolidation of the finding and assessment carried out during the entire IEE process. This IEE was guided by best international practices and conducted accordingly for Power Station Pvt Limited.

As stated earlier in the introductory paragraph this IEE study has been undertaken to conform to the requirements of the SEPA Act 2014; the Pakistan Initial Environmental Examination; Environmental Impact Assessment Review Regulations 2014. Furthermore, this IEE being an important social and environmental governance tool has gone beyond the legislative requirements. It has incorporated the international best practices, the company's social and environmental policies and compliance and contextual realities to integrate the philosophy and processes of sustainable development.

1.2 THE PROPONENT

I&MS Engineering (Pvt) Limited is an emerging engineering company, celebrating 21 years in providing complete engineering procurement construction and commissioning services in four different verticals . They also have a fifth vertical which generally is used in trading of goods and services. They are listed as C-2 contractor under Pakistan Engineering Council's category system and are registered in Securities and Exchange Commission of Pakistan as a limited liability company. They have paid up capital of 1 Billion (around USD10 Million) and have 300 employees spread over 3 regional and 1 international office. At I&MSE our focus is on building long term relationships. They boast of having 60% of their business via repeat business from existing clients.

They are recognized nationally and internationally, on diversified business solutions which are based on more than two and half decades of working with multinational, local, corporate and Government

institutions. Their technical team design, supply, commission and services different engineering solutions customized to their client's requirement.

1.3 CONSULTANT'S PROFILE



Global Environmental Management Services (Pvt.) Ltd. (GEMS) is an Environmental Consultancy which provides broad range of Environmental Solutions which are and not limited to Environmental Audits, Initial Environmental Examinations (IEE), Environmental Impact Assessments (EIA), Baseline studies and Training & Capacity building. GEMS is one of the few environmental firm having its own renowned ISO 17025 Certified Environmental Laboratory by the name of Global Environmental Laboratory (Pvt) Ltd.

GEMS have several divisions at work which provides core quality services. They are as follows:

1.3.1 Consultancy Division:

GEMS offer the following services to various industries, government institutions and international development organizations:

- Environmental impact assessments
- Environmental audits and management plans
- Baseline studies and habitat mapping
- Capacity building and trainings
- Cleaner production for industries

1.3.2 Laboratory Division:

GEMS Laboratory, Global Environmental Lab (Pvt.) Ltd. is the leading source of environmental solutions. It is providing 24 hours sampling and monitoring services to various sectors including:

- Liquid Effluent Analysis
- Drinking Water Analysis
- Soil and Sludge Analysis
- Microbiological Analysis
- Gaseous Emissions and Particulate Matter Analysis
- Ambient Air Monitoring
- Noise Level Measurements
- Light Intensity Measurements

- Complete Monitoring as per NEQS and SEQs

For over a decade GEMS have conducted ESIA's in an expanding range of Energy sector (oil and gas industry, power plants etc.), Manufacturing industries (e.g. pharmaceutical, mineral fertilizers, textile, paper, food processing etc.), Infrastructure projects (roads, highway's buildings etc.), ports and harbors, tourism, aquaculture and fisheries.

1.4 IEE STUDY TEAM

GEMS personnel have professional environmental and social experience extending throughout Pakistan and UAE. They are all qualified environmental and social scientists with complementary multi-disciplinary skills covering all major biomes of the environment. As a result GEMS is able to offer accurate, independent and appropriate services to its clients and to regulatory bodies.

1.5 CATEGORIZATION OF THE PROPOSED PROJECT

The proposed project is subjected to the "under Schedule I, Category D" of SEPA Review of IEE and EIA Regulations, 2014 which defines that such kind of projects requires an IEE at planning stage.

- **Schedule I**
- **Other projects**

Any other project for which filing of an IEE is required by the Agency under sub-regulation (2) of Regulation 6.

1.6 PURPOSE OF THE STUDY

The purpose of this IEE study is to evaluate the proposed project activities against the Pakistan Environmental Assessment Procedures, Sindh Environmental Protection Agency Act, 2014 and SEQs etc.

The specific objectives of this IEE report is to:

- Assess the existing environmental conditions of the proposed project area, including identification of environmentally sensitive areas and receptors;
- Assess the various activities to identify their potential impacts on environment, evaluate these impacts, and determine their significance;
- Propose appropriate mitigation measures that can be incorporated in the project to minimize the damaging effects or to the negative environmental and social consequences if identified during the assessment;
- Assess the proposed activities and determine whether they comply with the relevant environmental regulations of Sindh-EPA;
- Prepare an IEE report for submission, to the Sindh-EPA.

1.7 SCOPE OF THE STUDY

For this IEE study, the scope of work is as under:

- Organization of physical, biological socioeconomic and cultural baseline of the proposed project area;
- Project impact identification, prediction, and significance based on project activities.
- Identification and assessment of the workability of mitigation measures to offset or minimize negative project impacts on environment.

1.8 APPROACH AND METHODOLOGY

This IEE was performed in five main phases which are described below.

1.8.1 Scoping

The key activities of this phase included:

- **Project Data Compilation:** A generic description of the proposed activities, within the project area relevant to environmental assessment, was compiled with the help of PEPA Guidelines¹.
- **Literature and Legislation Review:** Secondary data on weather, soil, water resources, and wildlife vegetation was reviewed and compiled and information on relevant legislation, regulations, guidelines, and standards was reviewed and compiled.
- **Identification of Potential Impacts:** The information collected in the previous steps was reviewed, and potential environmental issues were identified.

1.8.2 Baseline Studies

Following the scoping exercise, the project area was surveyed to collect primary data. During the field visits, information was collected on;

- Ecologically important areas
- Ambient air quality
- Surface and groundwater resources
- Existing infrastructure
- Local communities
- Public services
- Sites of archaeological or cultural importance.

¹ Guidelines for Preparation and Review of Environmental Reports (Government of Pakistan, 1997)

The following specific studies were conducted as part of the IEE.

Biodiversity Study: Biodiversity experts conducted the biodiversity study, which consisted of a thorough literature review and field data collection. As part of the floral and faunal study, random sampling was conducted and the area's floral and faunal species were documented. The diversity of avian, large and small mammals, and reptile species was determined. Information was collected on the species found in the area.

Physical Environment: Environmental Assessment Specialists conducted physical environmental study including, ambient air, noise, water sampling, surface water resources and the groundwater resources of the areas.

Socioeconomic Study: A Socioeconomic expert conducted socioeconomic and cultural study in the proposed project area. The study team through participatory technique collected data from the locals of the proposed project area. The profile included livelihood, culture, leadership, gender issues, spiritual and temporal leadership, demographic information based on field data and published sources, the existing use of land resources, community structure, employment, distribution of income, goods and services, public health, local religious and cultural values, and local customs, aspirations, and attitudes.

1.8.3 Impact Assessment

The environmental, socioeconomic and cultural, gender and project information collected in previous phases was used to assess the potential impacts of the proposed activities. These included potential project impacts on:

- Groundwater and surface water quality;
- Ambient air quality;
- Ecology of the area, including flora and fauna;
- Local communities.

Wherever possible and applicable, the discussion covers the following aspects:

- The present baseline conditions;
- The change in environmental parameters likely to be affected by project related activities;
- Identification of potential impacts;
- Likelihood and significance of potential impacts;
- Mitigation measures to reduce impacts to as low as possible;
- Prediction of impacts, including all long-term and short-term, direct and indirect, and beneficial and adverse impacts;

- Evaluation of the importance or significance of impacts (The significance of each impact has been judged on the basis of available local, national, and international standards. Where such standards were not available, the best practice elsewhere has been referred to);
 - Implementation of mitigation measures (i.e., environmental management);
 - Determination of residual impacts;
 - Identification of controls and monitoring of residual impacts.

1.8.4 Documentation

At the end of the examination, an IEE report was prepared according to the relevant guidelines. This report includes the findings of the assessment, project impacts, and mitigation measures to be implemented during the execution of the proposed activities.

Components of this Report are:

Chapter: 1	Introduction
Chapter: 2	Project Description
Chapter: 3	Institutional, Legislation and policy framework
Chapter: 4	Physical Environment
Chapter: 5	Ecological Environment
Chapter: 6	Socio-Economic and Cultural Environment
Chapter: 7	Environmental Impacts & Mitigation
Chapter: 8	Environmental Monitoring and Management Plan
Chapter: 9	Conclusion

CHAPTER 2

PROJECT DESCRIPTION

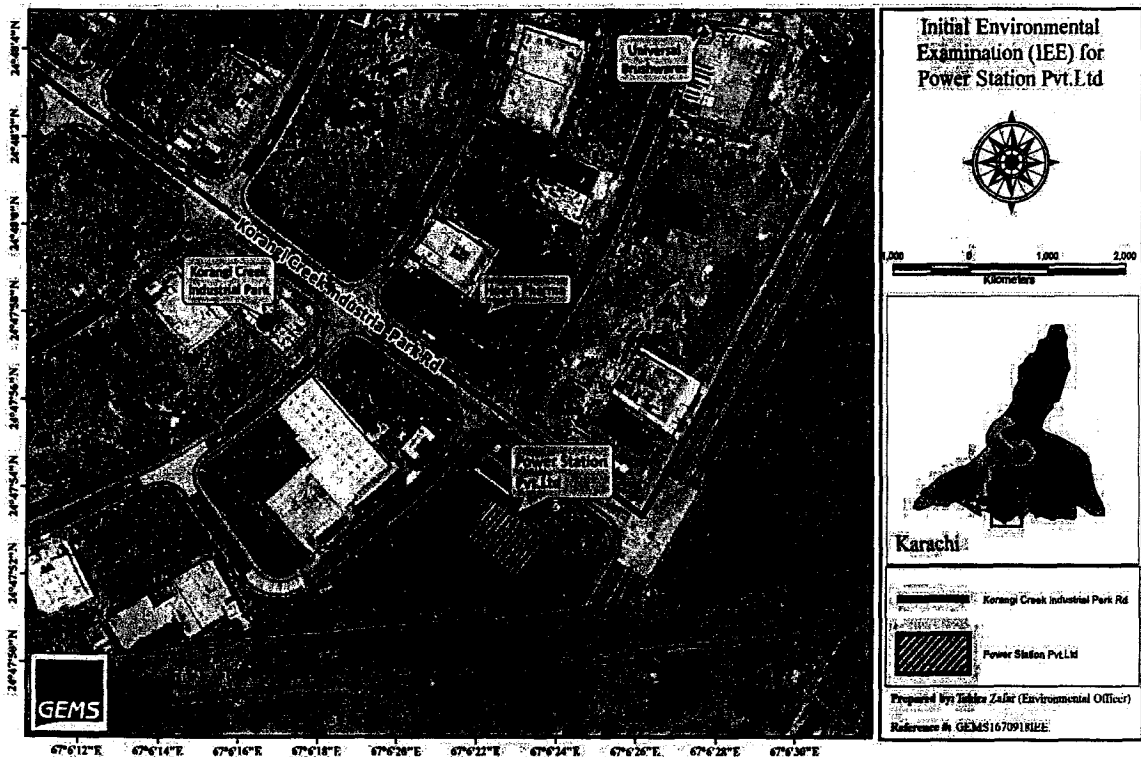
2.1 BACKGROUND INFORMATION

This section presents a detailed project description related to the proposed power Generation facility. A detailed insight regarding the project description was established by reconnaissance survey, site visit, and detailed discussions between project proponent and GEMS team. The proposed project will be establish with in the premises of Korangi Creek Industrial Park (KCIP).

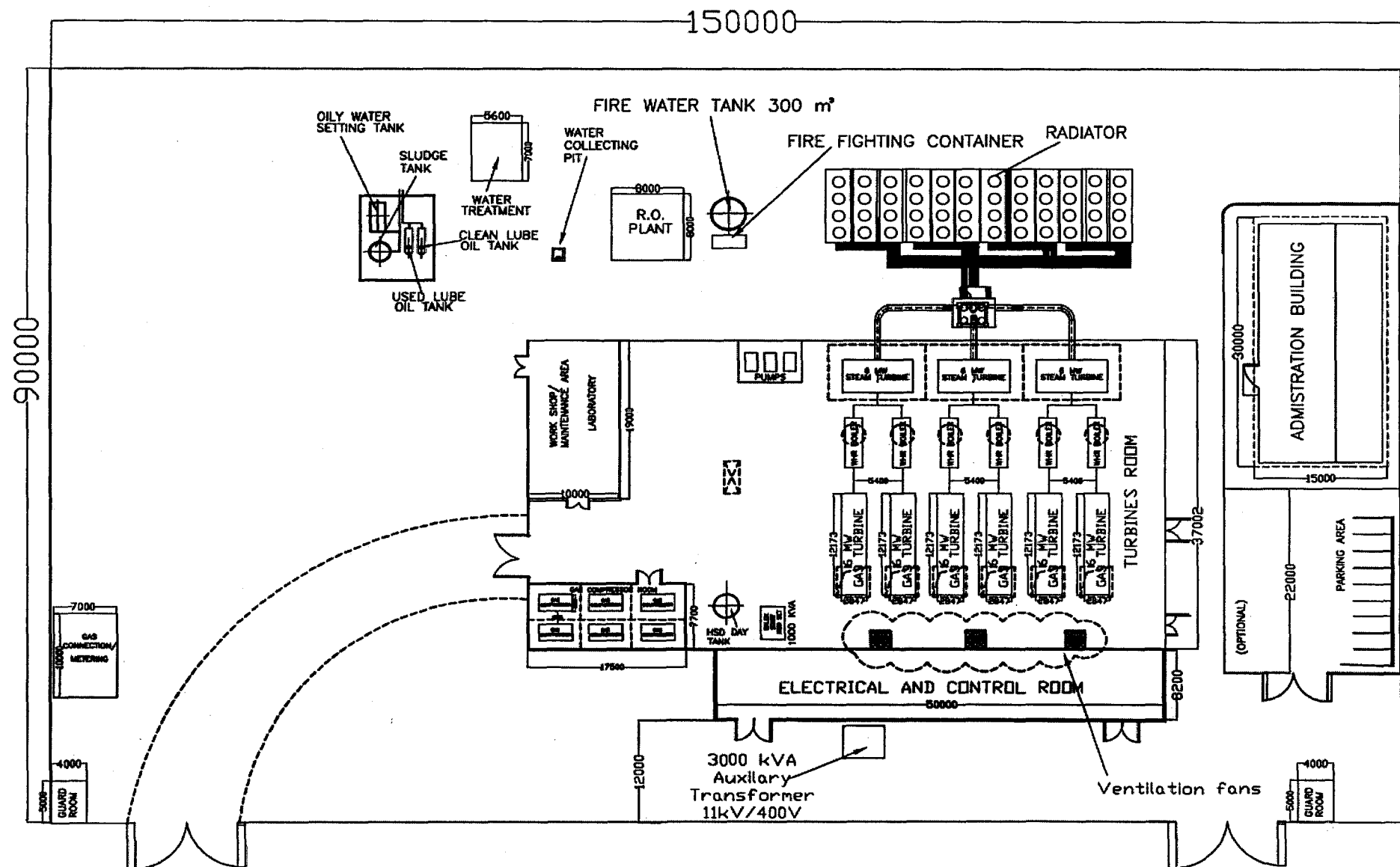
2.2 PROPONENT ADDRESS & LOCATION MAP

The proposed site has been allotted in existing industrial premises located at Plot No..... Korangi Creek Industrial Park, Korangi Creek Cantonment Karachi, Pakistan. Location map & layout are presented as Exhibit 2.1. & Exhibit 2.2 (a) & Exhibit 2.2 (b) respectively.

Exhibit 2.1 Location map



The site plan shows a proposed power house area of 0.36 acres, labeled 'MDS'. The plan includes an administration building, a parking area, and various utility structures such as a water tank, radiator, and power house. The plan also shows the location of the power house relative to the administration building and the parking area. The plan is labeled 'PRELIMINARY DESIGN' and includes a north arrow pointing towards the top right. The plan also shows the location of the power house relative to the administration building and the parking area. The plan is labeled 'PRELIMINARY DESIGN' and includes a north arrow pointing towards the top right.



2.3 JUSTIFICATION OF SITE SELECTION

Proposed project site has been allotted in existing industrial premises of Korangi Creek Industrial Park (KCIP). Site selection was guided by many factors like infrastructure, availability of land, water sources, fuel transportation, power availability etc. Specific site selection criteria for the proposed project are given below;

- Total plot area acquired by the facility is 12 Acre.
- Korangi Creek Industrial Park is the well-developed industrial area comprises of more than 80 industries, which are mainly pharmaceutical, chemical, cement industries etc. and having all basic infrastructure facilities like availability of water supply, natural gas, electricity, transport, telecommunication systems etc.
- There is no protected area notified under the Wild Life (Protection) Act (1972) & Eco-sensitive area notified under Section 3 of the Environment (Protection) Act 1997 exists within 10 Km radius areas from the project Site.
- Availability of trained and skilled manpower nearby because of the proximity to various industrial areas and city/town.

2.3.1 Power Generation Mechanism

The proponent is involved in the production of Electricity of about 53.406 MW Gross at Mean Site Conditions and gross ISO capacity of 60.24 MW resulting into an output of 48.233 MW based on 95% availability per annum and supply to various companies allocated in the exiting premises of National Industrial Park. The generated power from the Power Station will be supplied to different industries established and developed in National Industrial Park, Karachi. The project will supply to the industrial units at Kornagi Creek Industrial Park (KCIP) developed by National Industrial Parks Management Company (Pvt), Ministry of Industries & Production, and Government of Pakistan.

The proposed power generation plant shall be a Gas Turbine based combined cycle plant, consisting of:

- 3 sets, each set shall comprise of:
 - 2 units Gas Turbine Plant 6,400 kWe at 30 Deg C
 - With gas and liquid dual fuel capability
 - 2 units waste heat recovery boiler
 - capacity each 10,000 – 11,000 Kg/Hr
 - at 400/450 Deg C superheated steam
 - 40-45 bar
- 1 unit steam turbine plant 4800 kWe at MSC
- 11,000 volt switch gear

- Fuel gas compressor and all required accessories.

2.3.2 DESIGN SPECIFICATION

Performance	Electric output	6,070 kwe at 30 deg c (gas)
	Voltage	11 kilo volts
	Frequency	50 hz
Fuel specification ▪ Gas fuel	Natural gas Lhv Density Supply pressure 3 psig Supply temperature	8,000 kcal/nm ³ 0.7974 kg/nm ³ 10 deg c above dew point
▪ Liquid fuel	Light fuel oil Lhv Density Supply temp	10,250 kcal/kg 0.83 kg/lit ambient

Scope of Supply

S.NO		S.NO	
1.	Gas Turbine Generator Set	1.	Auxiliary System
2.	Gas Turbine	2.	Starting System
3.	Main reduction gear box	3.	Fuel system (gas and liquid fuel)
4.	Alternator with AVR	4.	Lubrication system
5.	Coupling	5.	Ventilation System
6.	Acoustical enclosure	6.	Combustion Air Intake
7.	Maintenance Platform for Gas Turbine	7.	Pulse cleaning filters
8.	Waste Heat Recovery Boiler	8.	Fuel oil nozzle water purge system
9.	Exhaust Gas ducts	9.	Exhaust gas system
10.	Exhaust gas silencer	10.	Compressor water wash system
11.	Expansion joints	11.	GTG package firefighting system
12.	Boiler bypass damper system	12.	Spare parts for GT and alternator with 2 years
13.	Feed water control system	13.	Steam Turbine generator and air cooled condenser
14.	Boiler control panel	14.	Speed reduction gearbox to 1500 rpm
15.	Freestanding switchboard	15.	Coupling and guard non sparking
16.	Water level limiter	16.	Emergency stop valve with steam strainer

17.	Automotive blow down valves	17.	Multi type governor valves
18.	Duct mounted economizer	18.	Over speed governor devices with hand trip device
19.		19.	Governor assembly
20.		20.	Output couplings steam piping
21.		21.	Auxiliary lube oil pump with relief valve emergency oil pump with relief valve

Configuration	6 x Gas Turbine Generators 6 x Waste Heat Recovery Boilers 3 x Steam Turbine Generators
Prime Mover	Kawasaki Gas Turbine Generator GBP-80
Fuel Gas Compressor	Howden – Austcold
Waste Heat Recovery Boiler	Cleaver Brookes S.C. Engineering
Steam Turbine Generator	ENGECROL – Moditech
Air Cooled Steam Condenser	6 Cells x 36 bundles DESCON
Pulse Cleaning Filter	Donaldson - Clarcor
Black Start Diesel Generator	Cummins Caterpillar

2.4 RESOURCE REQUIREMENTS

The proposed project requires additional water, power, fuel, human resources, machineries & utilities etc. The details of all major resources required for proposed project are described in subsequent sections under respective headings.

2.4.1 Man Power

The manpower is one of the main resource requirements to operate and maintain the plant in a better and efficient way. Total 150 personnel will be required during construction phase while during operation phase the company has planned to employ about 75 personnel at various departments.

2.4.2 Gas

During operation phase 261 MMCFT/month natural Gas will be utilized which will be sourced from SSGC.

2.5 Fire Management

The Proponent has developed a comprehensive emergency response plan in order to deal with various types of emergencies. However, installation of firefighting system has also been included in the construction phase.

2.6 Policies

2.6.1 Environmental Policy

Ref. EP-9501/ R-0608/04

Helping to create a better world through eco-friendly solutions, is the environment policy that I&MS Engineering (Pvt) Ltd has kept in forefront ". We have a responsibility and the spirit to fulfill the commitment to environmental protection.

We intend to:

- Take appropriate precautions to avoid environmental hazards and to prevent damage to the environment.
- Ensure that our environmental policy is implemented effectively by applying appropriate management systems. The technical and organizational procedures required to do this are monitored regularly and constantly further developed.
- Ensure sustainable development in environmental protection by careful use of natural resources. It is our aim to avoid pollution or to reduce it to a minimum, above and beyond statutory requirements.
- Work continually, toward reducing the burden on the environment, toward minimizing associated risks and toward lowering the use of energy and resources, above and beyond the legal requirements.
- Assess and incorporate the potential impact on the environment in product and process planning at the earliest possible stage.
- Require each employee to act in an environmentally conscious manner. It is the constant duty of management to increase and encourage awareness of responsibility at all levels.

2.6.2 Health and Safety Policy

Ref. HSP-9501/ R-0608/01

- I&MS Engineering (Pvt) Ltd is committed to quality in all of our policies, workplace environment and business practices, concerning the environment, health and safety.
- We strive to be global citizens in the communities in which we operate, and to provide a safe, healthy workplace.

- We are dedicated to complying with all environmental, health and safety laws and regulations wherever we conduct business around the world.
- I&MSE aim for excellence by implementing our H&S Management System with its supporting health, safety and environmental Standards and Procedures. This provides the framework and tools to enable managers and employees to perform work without injury to employees, contractors and others, and to prevent harm to the environment. The five environmental, health and safety commitments related to our business are: Continual Improvement to protect the environment and provide as safe working environment for us, our contractors, customers and the communities where we operate.
- Control and reduce hazards and business risks. Create products and solutions to improve H&S aspects across product life cycle phases when possible.
- Conserve natural resources and prevent pollution. Compliance to applicable H&S regulations and maintain market access.
- We set targets and objectives to ensure that we continually reduce the number of harmful incidents that occur. And, we work to instill these values in all of our employees, wherever they may be located.

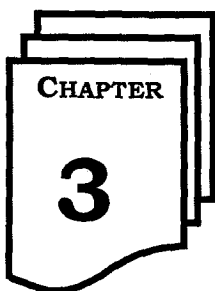
2.6.3 Quality Policy

Ref. QP-9501/R-0608/03

"It is the policy of I&MSE to never compromise on quality and put the zeal of quality work at the vanguard of all that we do."

At I&MS Engineering (Pvt) Ltd, we are committed with the defined fundamental principle as code of operations to support our corporate philosophy and to achieve mission statements. We have well defined quality assessment and assurance procedures producing nothing below then best. Periodical foreign trainings are initiative where professionals from all disciplines and departments of I&MSE are facilitated to become quality and process improvement experts Six Sigma business simplification and continuous quality improvement efforts generated thousands of satisfied customers over the period of Year 1995 -2005 with at least 45% of repeat orders.

We will apply the principles of this quality management standard to all our activities, thereby achieving a true company-wide quality system. Regardless of challenges from cost increase to commodities like fuel and steel, our strategic approach is unchanged and delivered outclass wholesome solutions and significant list of clients. We will ensure that all employees are involved in the drive for excellence in our business as we believe that the abilities, knowledge and experience of our staff are our most valuable resource.



INSTITUTIONAL, LEGISLATION AND POLICY FRAMEWORK

3.1 GENERAL OUTLINE AND SCOPE

The IEE of the proposed enhancement project will be subjected to the pertinent legislative and regulatory requirements of the Government of Pakistan including State laws. This chapter provides an overview of the policy framework and national legislation that applies to the proposed Project.

The environmental study includes primarily Sindh Environmental Protection Act 2014 (SEPA 2014), Sindh Environmental Protection Agency IEE and EIA review regulations (2014). All other laws and guidelines relevant to the project have also been reviewed. This chapter presents a synopsis of environmental policies, legislation and other guidelines that have relevance to the proposed project.

3.2 NATIONAL ENVIRONMENTAL POLICY, LEGISLATION AND GUIDELINES

The enactment of comprehensive legislation on the environment, covering multiple areas of concern, is a relatively new and ongoing phenomenon in Pakistan. Whereas, a basic policy and legislative framework for the protection of the environment and overall biodiversity in the country is now in place, detailed rules, regulations and guidelines required for the implementation of the policies and enforcement of legislation are still in various stages of formulation and discussion. The following section presents a brief overview of the existing national policies, legislation and guidelines.

3.2.1 National Conservation Strategy (NCS)

The National Conservation Strategy (NCS) is the primary Policy document of the Government of Pakistan on national environmental issues. The Policy was approved by the Federal Cabinet in March 1992. The Strategy also attained recognition by international donor agencies, principally the World Bank. The NCS identifies 14 core areas including conservation of biodiversity, pollution prevention and abatement, soil and water conservation and preservation of cultural heritage and recommends immediate attention to these core areas in order to preserve the country's environment.

A midterm review of the achievements of the NCS in 2000 concluded that achievements under the NCS have been primarily awareness raising and institutional building rather than actual improvement to environment and natural resources and that the NCS was not designed and is not adequately focused as a national sustainable development strategy¹. The need therefore arose for a

¹Arthur J. Hanson et al, *Pakistan's National Conservation Strategy Renewing Commitment to Action, Report of the Mid-Term Review, 2000*

more focused National Environmental Action Plan (NEAP) required to bring about actual improvements in the state of the national environment with greater emphasis on poverty reduction and economic development in addition to environmental sustainability.

The NEAP was approved by the Pakistan Environmental Protection Council under the chairmanship of the President/Chief Executive of Pakistan in February 2001. NEAP now constitutes the national environmental agenda and its core objective is to initiate actions that safeguard public health, promote sustainable livelihoods, and enhance the quality of life of the people of Pakistan.

A National Environmental Policy has been approved by the Federal Cabinet in its meeting held during June 2005². This policy has already been endorsed by the Pakistan Environmental Protection Council during 2004. The new policy has total 171 guidelines on sectoral and cross-sectoral issues. The objectives of new policy include assurance of sustainable development and safeguard of the natural wealth of country. The following are the approved Sectoral Guidelines;

- ❖ Water Supply and Management;
- ❖ Air Quality and Noise;
- ❖ Waste Management;
- ❖ Forestry;
- ❖ Biodiversity and Protected Areas;
- ❖ Climate Change and Ozone Depletion;
- ❖ Energy Efficiency and Renewable;
- ❖ Agriculture and Livestock;
- ❖ Multilateral Environmental Agreements.

3.2.2 Sindh Environmental Protection Act 2014

The Sindh Environmental Protection Act, 2014 (SEPA 2014) is the basic legislative tool empowering the government to frame regulations for the protection of the environment. The SEPA 2014 is broadly applicable to air, water, soil, marine and noise pollution. Penalties have been prescribed for those contravening the provisions of the Act.

The two primary deliberations of the Act are the conduct of projects only after approval of environmental assessments from the SEPA and adherence with Sindh Environmental Quality Standards (SEQS).

3.2.3 Approval from Sindh Environment Protection Agency (SEPA)

As per the 2014 Regulations, Proponent will submit an IEE report for their proposed project activities to SEPA, and seek approval on the same from the Agency. Ten (10) hard copies and two(02) soft copies of the IEE report will be need to be submitted to SEPA. It will then grant its decision on the IEE as per the rules and procedures set out in the 2014 Regulations. The following rules will apply:

² National Environmental Policy, GoP, 2005

- ❖ A fee is payable to SEPA for review of the EIA& IEE;
- ❖ The IEE submission is to be accompanied by an application in the format prescribed in Schedule V of the 2014 Regulations;
- ❖ SEPA is to conduct a preliminary scrutiny and reply within fifteen (15) days of the submission of the report a) confirming completeness, or b) asking for additional information, if needed;
- ❖ In the review process SEPA may consult a Committee of Experts, which maybe constituted on the request of the DG SEPA;
- ❖ On completion of the review process, the decision of SEPA will be communicated to the proponent in the form prescribed in Schedule V;
- ❖ Where an IEE is approved, SEPA can impose additional controls as part of the conditions of approval;
- ❖ SEPA is required to make every effort to complete the IEE review process within sixty (60) days of the issue of confirmation of completeness. However, SEPA can take up to four(4) months for communication of final decision;
- ❖ The approval will remain valid for the project duration mentioned in the IEE but on the condition that the project commences within a period of three (03) years from the date of approval. If the project is initiated after three years from approval date, the proponent will have to apply for an extension in the validity period. The SEPA on receiving such request grant extension (not exceeding 3 years at a time) or require the proponent to submit a fresh IEE if in the opinion of SEPA changes in baseline conditions or the project so warrant;
- ❖ After receiving approval from SEPA the proponent will acknowledge acceptance of the conditions of approval by executing an undertaking in the form prescribed in Schedule VI of the 2014 Regulations;
- ❖ The 2014 Regulations also require proponents to obtain from SEPA, after completion of the project, a confirmation that the requirements of the IEE and the conditions of approval have been duly complied with;
- ❖ The SEPA in granting the confirmation of compliance may impose any additional control regarding the environmental management of the project or the operation, as it deems necessary.

3.2.4 Sindh Environmental Protection Agency Review of IEE and EIA Regulations, 2014

The SEPA Review of IEE and EIA Regulations, 2014 (The 2014 Regulations) promulgated under SEPA 2014 were enforced on December, 2014. The 2014 Regulations define the applicability and procedures for preparation, submission and review of IEEs and EIAs. These Regulations also give legal status to the Pakistan Environmental Assessment Procedures prepared by SEPA in 2014.

The Regulation classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules. Schedule I lists projects that may not have significant environmental impacts and therefore require an IEE. Schedule II lists projects of potentially significant environmental impacts requiring preparation of an EIA. The Regulations also require that all projects located in environmentally sensitive areas require preparation of an EIA.

The following project falls under the following category:

Schedule I (IEE):

- Other projects

Any other project for which filing of an IEE is required by the Agency under sub-regulation (2) of Regulation 6.

3.2.5 The Sindh Environmental Quality Standards

During the construction and post development phase of the project SEQs will apply to all effluents and emissions. SEQs for municipal and industrial effluents, selected gaseous pollutants from industrial sources and motor vehicle exhaust and noise are provided in **Exhibit 3.1, Exhibit 3.2, Exhibit 3.3, Exhibit 3.4 & Exhibit 3.4**. SEQs for disposal of solid waste have as yet not been promulgated³.

3.2.6 Land Acquisition Act, 1894

The Land Acquisition Act (LAA) of 1894 amended from time to time has been the defacto policy governing land acquisition, resettlement and compensation in the country. The LAA is the most commonly used law for acquisition of land and other properties for development projects. It comprises of 55 sections pertaining to area notifications and surveys, acquisition, compensation and apportionment awards and disputes resolution, penalties and exemptions.

3.2.7 Pakistan Penal Code (1860)

The Pakistan Penal Code (1860) authorizes fines, imprisonment or both for voluntary corruption or fouling of public springs or reservoirs so as to make them less fit for ordinary use⁴.

3.2.8 The Antiquities Act, 1975

The Antiquities Act of 1975 ensures the protection of cultural resources of Pakistan. The Act is designed to protect 'antiquities' from destruction, theft, negligence, unlawful excavation, trade, and export. Antiquities have been defined in the Act as ancient products of human activity, historical sites, or sites of anthropological or cultural interest, national monuments, etc. The law prohibits new

³ Library, Sindh Environmental Protection Agency, 2016

⁴ www.fmu.gov.pk

construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area that may contain articles of archaeological significance.

Under the Act, the project proponents are obligated to:

- ❖ Ensure that no activity is undertaken in the proximity of a protected antiquity;
- ❖ Report to the Department of Archeology, Government of Pakistan, any archeological discovery made during the course of a project⁵.

3.2.9 The Factories Act, 1934

The clauses relevant to the project are those that concern to health, safety and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulation for handling and disposal of toxic and hazardous materials⁶.

3.2.10 Electricity Act, 1910

The Act provides a legal base for power distribution. A licensee under this Act is enabled to operate supply of electricity. This Act obligate licensee to pay compensation for any damages caused during the constructions and maintenance of any power distribution facilities.

3.3 NATIONAL AND INTERNATIONAL GUIDELINES OR STANDARDS

3.3.1 The Pakistan Environmental Assessment Procedures, 1997

The Pakistan Environmental Protection Agency prepared the Pakistan Environmental Assessment Procedures in 1997. They are based on much of the existing work done by international donor agencies and Non-Governmental Organizations (NGO's). The package of regulations prepared by PEPA includes:

- ❖ Policy and Procedures for Filing, Review and Approval of Environmental Assessments;
- ❖ Guidelines for the Preparation and Review of Environmental Reports;
- ❖ Guidelines for Public Consultation;
- ❖ Guidelines for Sensitive and Critical Areas; and
- ❖ Sectoral Guidelines for various types of projects.

3.3.2 OSHA Standards Health Safety

The Occupational Safety and Health Administration (OSHA) are issuing safety and health program management guidelines for use by employers to prevent occupational injuries and illnesses. The

⁵ pakistancode.gov.pk, 2005

⁶ pakistancode.gov.pk, 2005

Occupational Safety and Health Act of 1970 (OSHA) representatives have noted a strong correlation between the application of sound management practices in the operation of safety and health programs and a low incidence of occupational injuries and illnesses. Where effective safety and health management is practiced, injury and illness rates are significantly less than rates at comparable worksites where safety and health management is weak or non-existent.

OSHA has concluded that effective management of worker safety and health protection is a decisive factor in reducing the extent and the severity of work-related injuries and illnesses. Effective management addresses all work-related hazards, including those potential hazards which could result from a change in worksite conditions or practices. It addresses hazards whether or not they are regulated by government standards.

Pollutant	Time-weighted average	Concentration in Ambient Air	Method of measurement
Sulfur Dioxide (SO ₂)	Annual Average*	80 ug/m ³	Ultraviolet Fluorescence method
	24 hours**	120 ug/m ³	
Oxides of Nitrogen as (NO)	Annual Average*	40 ug/m ³	Gas Phase Chemiluminescence
	24 hours**	40 ug/m ³	
Oxides of Nitrogen as (NO ₂)	Annual Average*	40 ug/m ³	Gas Phase Chemiluminescence
	24 hours**	80 ug/m ³	
Ozone (O ₃)	1 hour	130 ug/m ³	Non dispersive UV absorption method
Suspended Particulate Matter (SPM)	Annual Average*	360 ug/m ³	High Volume Sampling, (Average flow rate not less than 1.1 in 3min/sec).
	24 hours**	500 ug/m ³	
Respirable Particulate Matter PM ₁₀	Annual Average*	120 ug/m ³	β-Ray absorption method
	24 hours**	150 ug/m ³	
Respirable Particulate Matter PM _{2.5}	Annual Average*	40 ug/m ³ ***	Preferably β-Ray absorption method
	24 hours**	75 ug/m ³	
Lead (Pb)	Annual Average*	1 ug/m ³	ASS Method after sampling using EPM 2000 or equivalent Filter paper
	24 hours**	1.5 ug/m ³	
Carbon Monoxide (CO)	8 hours**	5 mg/m ³	Non Dispersive Infra-Red (NDIR) method
	1 hour	10 mg/m ³	

Exhibit 3. 1:SEQS for Ambient Air

*annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

**24 hourly /8 hourly values should be met 98% in a year. 2% of the time, it may exceed but not on two consecutive days.

***Annual average limit of 40ug/m³ or background annual average concentration plus allowable allowance of 9ug/m³, whichever is lower.

Exhibit 3. 2:SEQS for Municipal and Industrial Effluents^a

Parameters	Into Inland Water(mg/l)	Into Sewage Treatment(mg/l)
Temperature or temperature increase ^c	≤3°C	≤3°C
pH	6-9	6-9
Biochemical Oxygen Demand (BOD ₅) at 20°C ^d	80	250
Chemical Oxygen Demand (COD) ^d	150	400
Total Suspended Solids (TSS)	200	400
Total Dissolved Solids (TDS)	3,500	3,500
Grease and Oil	10	10
Phenolic compounds (as phenol)	0.1	0.3
Chloride (as Cl ⁻)	1,000	1,000
Fluoride (as F)	10	10
Total cyanide (as CN ⁻)	1.0	1.0
An-ionic detergents (as MBAS) ^e	20	20
Sulphate (SO ₄)	600	1000
Sulphide (S ⁻)	1.0	1.0
Ammonia (NH ₃)	40	40
Pesticides ^f	0.15	0.15
Cadmium ^g	0.1	0.1
Chromium (trivalent & hexavalent) ^g	1.0	1.0
Copper ^g	1.0	1.0
Lead ^g	0.5	0.5
Mercury ^g	0.01	0.01

Parameters	Into Inland Water(mg/l)	Into Sewage Treatment(mg/l)
Selenium ^g	0.5	0.5
Nickel ^g	1.0	1.0
Silver ^g	1.0	1.0
Total Toxic metals	2.0	2.0
Zinc	5.0	5.0
Arsenic ^g	1.0	1.0
Barium ^g	1.5	1.5
Iron	8.0	8.0
Manganese	1.5	1.5
Boron ^g	6.0	6.0
Chlorine	1.0	1.0

Notes

^aAll values are in mg/l, unless otherwise defined

^bApplicable only when and where sewage treatment is operational and BOD₅=80 mg/L is achieved by the sewage treatment system

^cThe effluent should not result in temperature increase of more than 3°C at the edge of zone where initial mixing and dilution take place in the receiving body. In case zone is defined, use 100 meters from the point of discharge

^dAssuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Sindh Environmental Protection Agency. By 1:10 dilution means, for example that for each one cubic meter of treated effluent, the recipient water body should have 10 cubic meter of water for dilution of this effluent

^eModified Benzene Alkyl Sulphate; assuming surfactant as biodegradable

^fPesticides include herbicide, fungicides and insecticides

^gSubject to the total toxic metals discharge should not exceed level of total toxic metals

Exhibit 3. 3:SEQS for Selected Gaseous Pollutants from Industrial Sources ^a

Parameter	Source of emission	Standard(mg/Nm ³)
Smoke	Any	40% or 2 Ringlemann scale or equivalent smoke number
Particulate matter ^b	Boilers and furnaces:	
	Oil fired	300
	Coal fired	500
	Cement kilns	300
	Grinding, crushing, clinker coolers and related processes, metallurgical processes, converter blast furnaces and cupolas	500
Hydrogen chloride	Any	400
Chlorine	Any	150
Hydrogen fluoride	Any	150
Hydrogen sulfide	Any	10
Sulfur oxides ^c	Sulfuric acid/Sulfonic acid plants	5,000
	Other plants except power plants operating on oil and coal	1,700
Carbon monoxide	Any	800
Lead	Any	50
Mercury	Any	10
Cadmium	Any	20
Arsenic	Any	20
Copper	Any	50

Parameter	Source of emission	Standard(mg/Nm ³)
Antimony	Any	20
Zinc	Any	200
Oxides of nitrogen ^d	Nitric acid manufacturing unit	3,000
	Other plants except power plants operating on oil or coal:	
	Oil Fired	400
	Coal fired	600
	Cement kilns	1,200

Notes:

a All values are in mg/Nm³, unless otherwise defined

b Based on the assumption that the size of the particulates is 10 micron or more

c Based on 1% sulphur content in fuel oil. Higher content of sulphur will cause standards to be pro-rated

d In respect of the emissions of the sulfur dioxide and nitrogen oxides, the power plants operating on oil or coal as fuel shall, in addition to SEQS specified above, comply with the following standards

Exhibit 3. 4:SEQS for Motor Vehicle Exhaust and Noise

Parameter	Standard	Measuring Method
Smoke	40% or 2 on the Ringelmann scale during engine acceleration mode	To be compared with Ringelmann Chart at a distance of 6 meters or more
Carbon Monoxide	6%	Under idling conditions, non-dispersive infrared detection through gas analyzer
Noise	85 dB (A)	Sound-meter at 7.5 meters from the source

Exhibit 3. 5:SEQS for Noise

S. No	Category of Area/Zone	Effective from 1st Jan, 2016	
		Limits in dB	
		Day Time	Night Time
1	Residential Area	65	50
2	Commercial Area	70	60
3	Industrial Area	80	75
4	Silence Area	55	45

Note:

1. Day Time hours: 6.00am to 10.00pm
2. Night Time hours: 10.00pm to 6.00am
3. Silence Zone: zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts.
4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

dB: Time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

PHYSICAL ENVIRONMENT

4.1 GENERAL OUTLINE AND SCOPE

This section of the IEE document presents a detailed description of physical environmental conditions of the study area. The data collection techniques are combination of both primary and secondary means by field verifications, observations, sampling and monitoring which was supplemented by review of published literature and previously conducted studies in the proposed project surrounding areas.

The base line data defines, elaborates and present physical environmental quality within the project surrounding.

Key Features of Physical Baseline

- Topography and land use
- Geology
- Climate
- Air Quality
- Water Resources
- Water Quality

4.2 TOPOGRAPHY AND LAND USE

The city of Karachi has a land area of 3,640 km² and is located on the Arabian Seacoast in the extreme south of Pakistan; the city is located at 24°45" to 25°15" north and 66°37" to 67°03" east. It is bounded by Dadu District in the northeast, Thatta District in the southeast, the Arabian Sea to the south and the Lasbela District of Balochistan Province to the west.

Karachi may be broadly divided into two parts; the hilly areas in the north and west and an undulating plain and coastal area in the south-east. The hills in Karachi are the off-shoots of the Keirthar Range. The highest point of these hills in Karachi is about 528m in the extreme north. All these hills are devoid of vegetation and have wide intervening plains, dry river beds and water channels. Karachi has a long coastline in the south. Specifically the topography of the study area is quite gentle and its elevation is increasing as we move towards the north. **Exhibit 4.1** represents the topographic elevation map of the proposed project areas.

Exhibit 4.2 represents the land cover pattern of Karachi, while **Exhibit 4.3** represents graphical representation of the land cover pattern of the proposed project area.

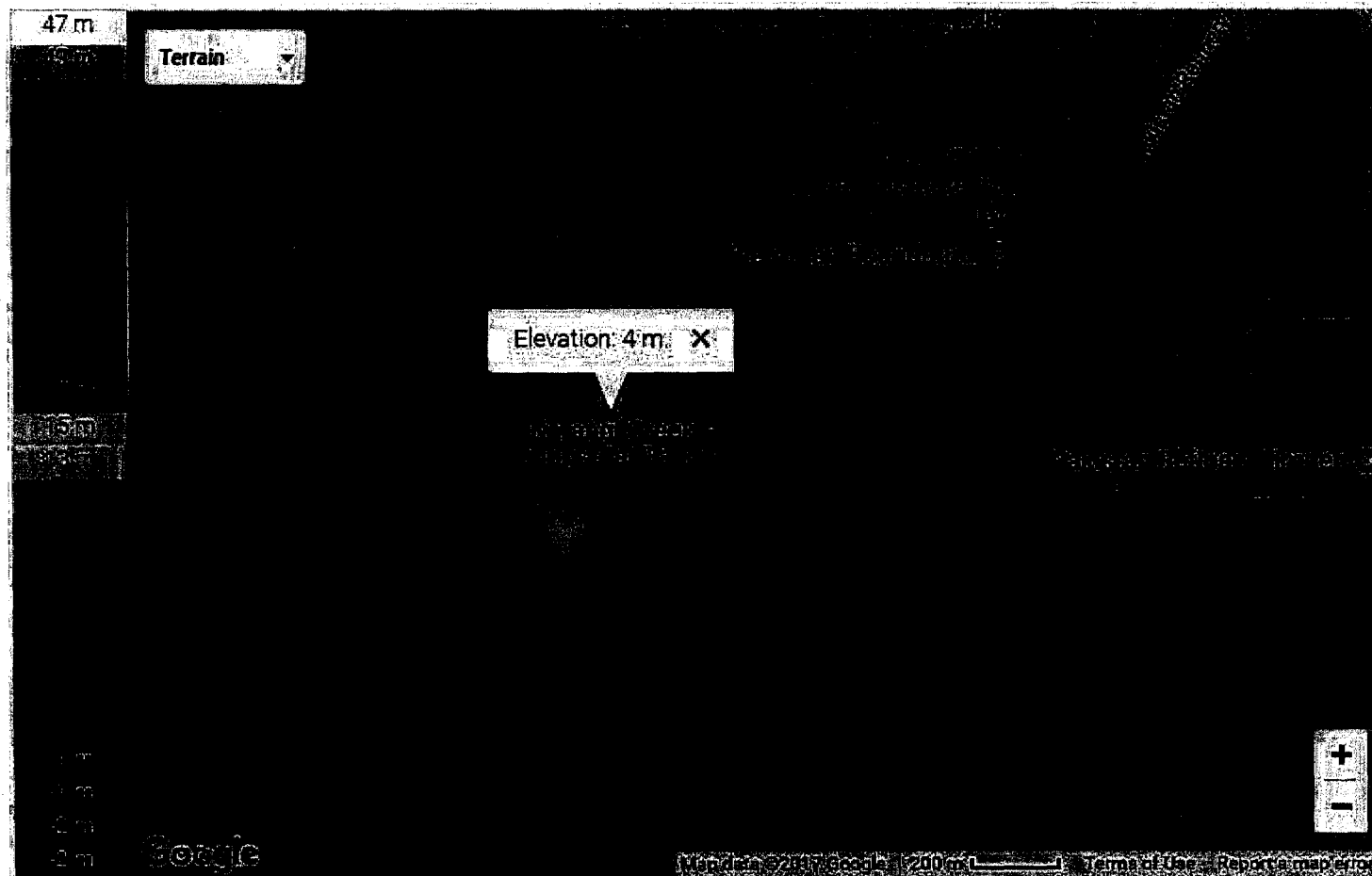
Exhibit 4. 1:Topographic Elevation Map of the Proposed Project Areas

Exhibit 4. 2: Graphical Representation of the Land Cover Pattern of the Proposed Project Area

Land Cover and Use Class	Area (Hectares)
Industrial and Commercial Areas	10,210
Built-up Residential Areas	11,938
Agricultural Areas	17,130
Saline Channels and Creeks (Intertidal)	53,765
Mangroves	35,546
Mudflat and Beaches	18,915
Total Study Area	147,504

4.3 GEOLOGY

Geology of the area under focus is underlain a lower Indus basin described as Indus river alluvial early Eocene*. Early deposition of sediments include silt, sand stone, conglomerate, limestone with low compact and cementing materials. As per stratigraphic description, Gazij and Manchar inclined two formations gently northeast to southeast in offshore. The coastal region is found to be of tertiary and post-tertiary origin. Blatter et al (1929) dates it as recent as Eocene.

The exposed geological material in the area is generally silty sand, sandy gravel and silty clay which is either product of in-situ weathering or deposited by the action of gravity and water. The rock formation of this area is from Nari Formation of Oligocene age and partially from Gaj Formation of Miocene age. The underlying rocks are mostly of marine origin, highly folded, faulted and fissured everywhere (*Sidra et al, 2010 Situation Analysis of Sindh Coast Issues and Options*).

4.4 SOIL CONDITION

The soil in the plains of Sindh is plastic clay that has been deposited by the Indus, Combined with water it develops into a rich mould and without water it degenerates into a soil of desert category. Nearly the entire Indus valley has soil which is extremely friable and easily disintegrated by the flow of water. Resultantly, the water always contains a large amount of suspended silt. The soils are generally secondary in nature deposited by the water or air in the area of the candidate sections. The soils in the vicinity are generally coarse textured extensively laden with gravels and pebbles. Due to scarcity of water and non-conductive conditions, the soils are rarely cultivated.

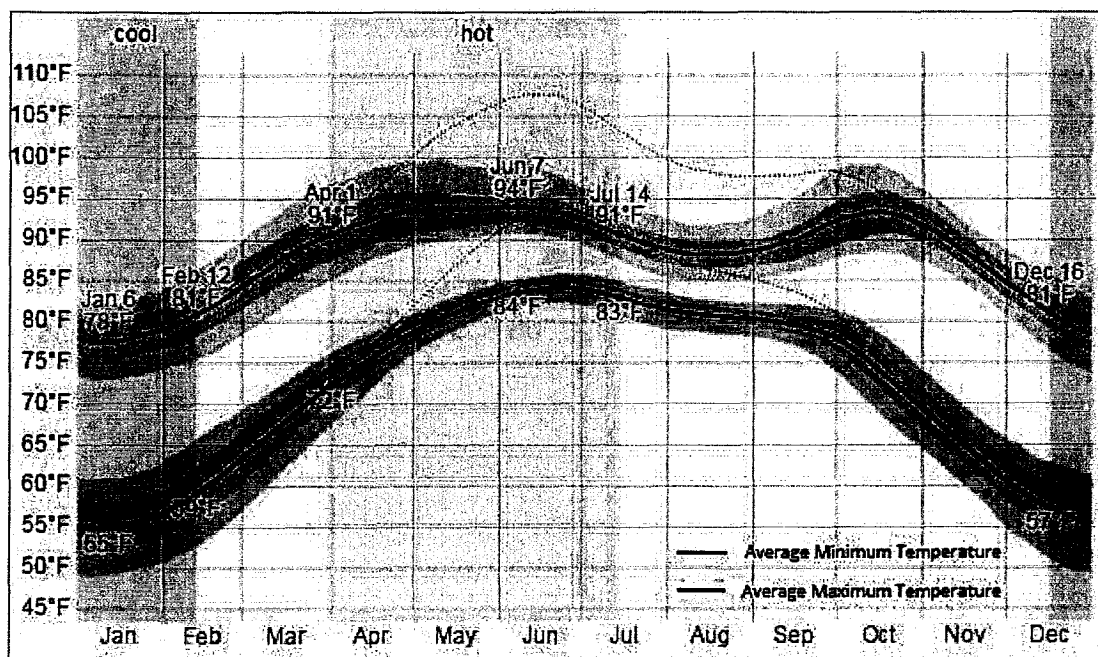
EOCENE

The Eocene Epoch, lasting from 56 to 33.9 million years ago, is a major division of the geologic timescale and the second epoch of the Paleogene Period in the Cenozoic Era

4.5 CLIMATE

The climate of Karachi is characterized as hot and dry during summer, and mild during winter with heavy, sporadic, rainfall during the monsoon. The summer monsoon prevails in the Proposed Project area from Mid-March to Mid-June characterized by very hot temperatures, dry conditions, moderate wind from the southwest and low humidity; high rainfall, high temperatures, high humidity characterize Monsoons from Mid-June to Mid-September, and high winds from the southwest. Although the temperatures are milder compared to summer but high humidity makes the heat oppressive; Post-monsoon summer that is from Mid-September to Mid-November is characterized by cessation of rains and reduction in wind speed. Temperature increases by couple of degrees and humid decreases by about 10%; and winters monsoon from Mid-November to Mid-March is characterized by moderate temperature, dry conditions, low humidity, and low winds from the north and northeast. The monsoon is characterized by a reversal in wind direction during the remaining months and heavy rainfall occurs over most part of the Indian Subcontinent. In Karachi over the course of the year, the temperature typically varies from 55°F to 94°F and is rarely below 49°F or above 100°F. Yearly mean maximum and minimum temperatures from January 1, 1980 to December 31, 2016 are presented below in **Exhibit 4.4**.

Exhibit 4. 3: Mean Maximum and Minimum Temperature of Karachi (January 1-1980 to December 31-2016)



Source: Weather Spark.com

4.6 RAINFALL

According to IPCC report, 2007 decrease in rainfall pattern has been observed along the coastal belt and arid plains of Pakistan, in upcoming years most part of Pakistan will experience dry humid conditions especially Sindh, Balochistan, Punjab and the central parts of Northern Areas will receive

less than 250 mm of rainfall in a year (PMD). The yearly average rainfall pattern of Karachi from January 1, 1980 to December 31, 2016 shows some seasonal variation in monthly rainfall.

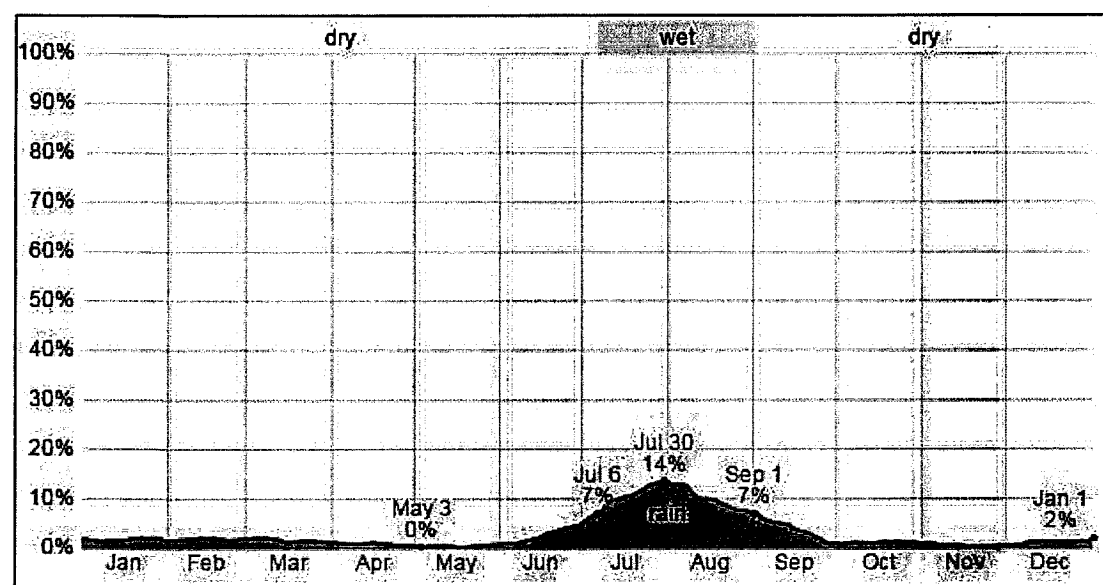
The *rainy period* of the year lasts for 3 months, from June 25 to September 15,. The most rain falls during the month of July. The *rainless period* of the year lasts for almost 9 months, from September 15 to June 25. The least rain falls around May.

The probability of precipitation and wet days observed at KIA varies throughout the year. The *wetter season* lasts 2 months, from July 6 to September 1. The chance of a wet day peaks at 14% on July 30.

The *drier season* lasts 10 months, from September 1 to July 6. The smallest chance of a wet day is 0% on May 3.

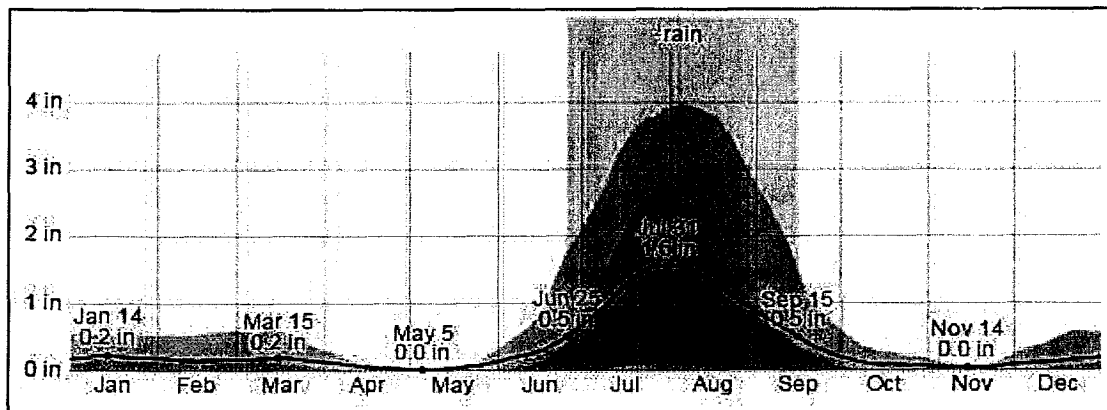
Based on the categorization of *rain alone*, *snow alone*, or a mixture of the two, the most common form of precipitation throughout the year is *rain alone*, with a peak probability of 14% on July 30. The mean monthly precipitation records for Karachi South District can be seen in **Exhibit 4.5**, while **Exhibit 4.6** mean monthly rainfall pattern of Karachi presented below.

Exhibit 4. 4:Maximum Precipitation (%) (January 1-1980 to December 31-2016)



Source: Weather Spark.com

Exhibit 4. 5:Average Monthly Rainfall (January 1-1980 to December 31-2016)



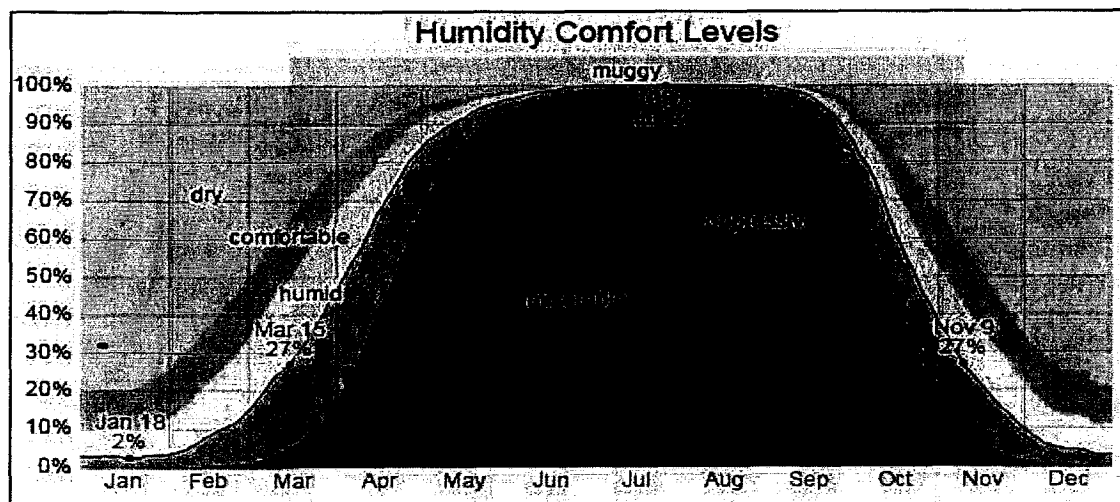
Source: Weather Spark.com

4.7 RELATIVE HUMIDITY

Karachi experiences *very significant* seasonal variation in the perceived humidity. The humidity comfort level is based on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between day and night, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

The *muggier period* of the year lasts for 8 months, from March 15 to November 9, during which time the comfort level is *muggy, oppressive, or miserable* at least 27% of the time. The *muggiest day* of the year is July 26, with muggy conditions 100% of the time. The *least muggy day* of the year is January 18, with muggy conditions 2% of the time. The mean monthly relative humidity for Karachi South district can be seen in Exhibit 4.7.

Exhibit 4. 6:Relative Humidity



Source: Weather Spark.com

4.8 WIND SPEED AND DIRECTION

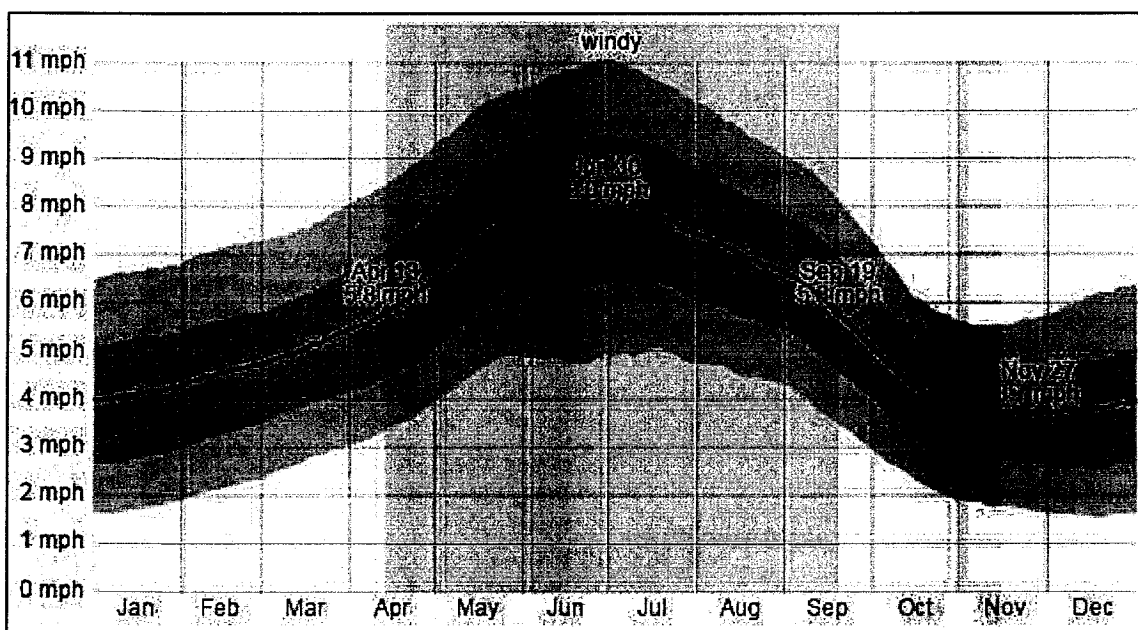
The proposed project area lies in a region where wind blows throughout the year with highest velocities. During summer, the direction of the wind is from south-west to west and during winter season the wind blows from north to northeast and it shifts southwest to west in the evening hours. The wind usually carries sand and salt with it resulting in severe corrosion and erosion. The wind direction and speed in between the two monsoon seasons, summer and winter are rather unsettled and large variations have been recorded in terms of speed and direction. The seasonal winds are dry and have a desiccating effect during May & June, in July and August the wind contains moisture.

The average hourly wind speed in Karachi experiences *significant* seasonal variation over the course of the year. The *windier* part of the year lasts for 5 months, from April 13 to September 19, with average wind speeds of more than 5.8 miles per hour. The *windiest* day of the year is June 30, with an average hourly wind speed of 8.0 miles per hour.

The *calmer* time of year lasts for 7 months, from September 19 to April 13. The *calmest* day of the year is November 27, with an average hourly wind speed of 3.7 miles per hour.

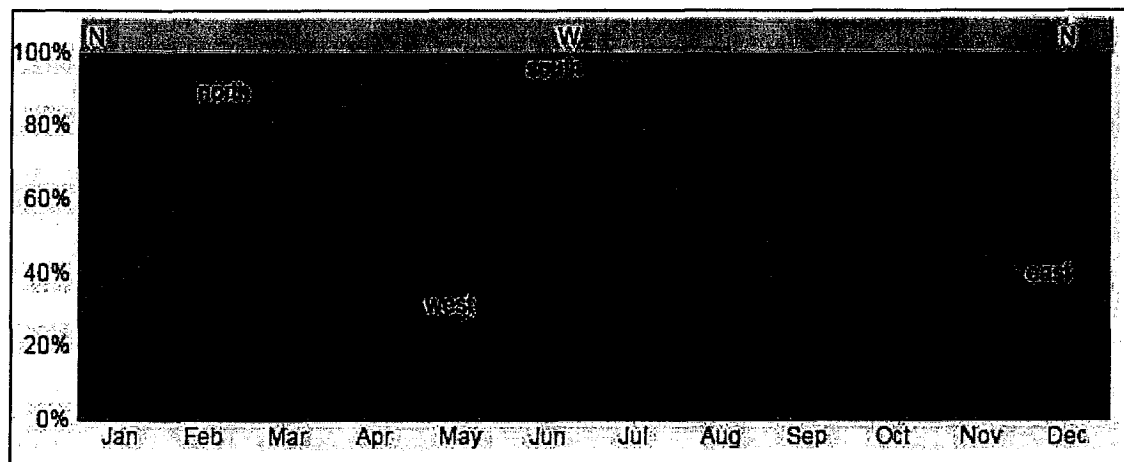
The predominant average hourly wind direction in Karachi varies throughout the year. The wind is most often from the west for 11 months, from January 13 to November 30, with a peak percentage of 92% on May 2. The wind is most often from the north for 1.5 months, from November 30 to January 13, with a peak percentage of 39% on December 8. Exhibit 4.8 and 4.9 shows the average wind speed and direction of wind in the proposed project area.

Exhibit 4. 7: Average Wind Speed (January 1-1980 to December 31-2016)



Source: Weather Spark.com

Exhibit 4. 8: Wind Direction over the Entire Year (January 1-1980 to December 31-2016)



Source: Weather Spark.com

4.9 AMBIENT AIR QUALITY& NOISE LEVEL

Air pollution has a direct impact on the health of humans and the environment. To assess the ambient air quality baseline components in the proposed project surrounding, the ambient air monitoring equipment was placed at different sample locations by team of Environmental Sampling and Monitoring (ESM). The ESM carried out ambient air monitoring on 27th August, 2018 at 5 different locations with the project surrounding to monitor the compliance status under SEQs. Ambient air quality and noise level sampling map and monitoring results can be seen in **Exhibit 4.10**, **Exhibit 4.11** and **Exhibit 4.12** respectively.

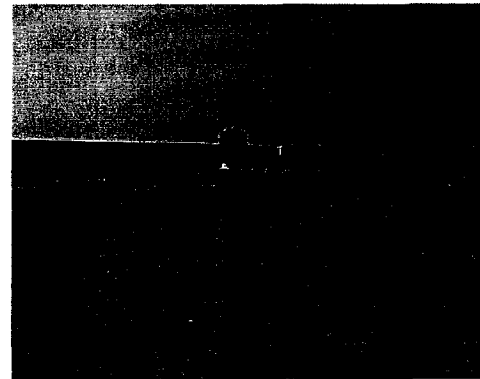


Exhibit 4. 9:Ambient Air Quality and Noise level Monitoring Results.

S.no	Parameters	Units	SEQs Limits	Concentration				
				Location-1	Location-2	Location-3	Location-4	Location-5
1	Carbon Monoxide (CO)	mg/m ³	10	<1	<1	<1	<1	<1
5	Particulate Matter (SPM)	ug/m ³	500	111	102	109	106	100
6	Particulate Matter (PM ₁₀)	ug/m ³	150	67	62	69	71	68
7	Particulate Matter (PM _{2.5})	µg/m ³	75	32	36	31	39	42
8	Noise	dB	80	56	55	59	60	62

4.10 WATER RESOURCES

This section details the water resources of the proposed project area. Both, surface and ground water resources have been summarized in this section of the report. Data was obtained through field observation, secondary sources and data collection (IEE field survey).

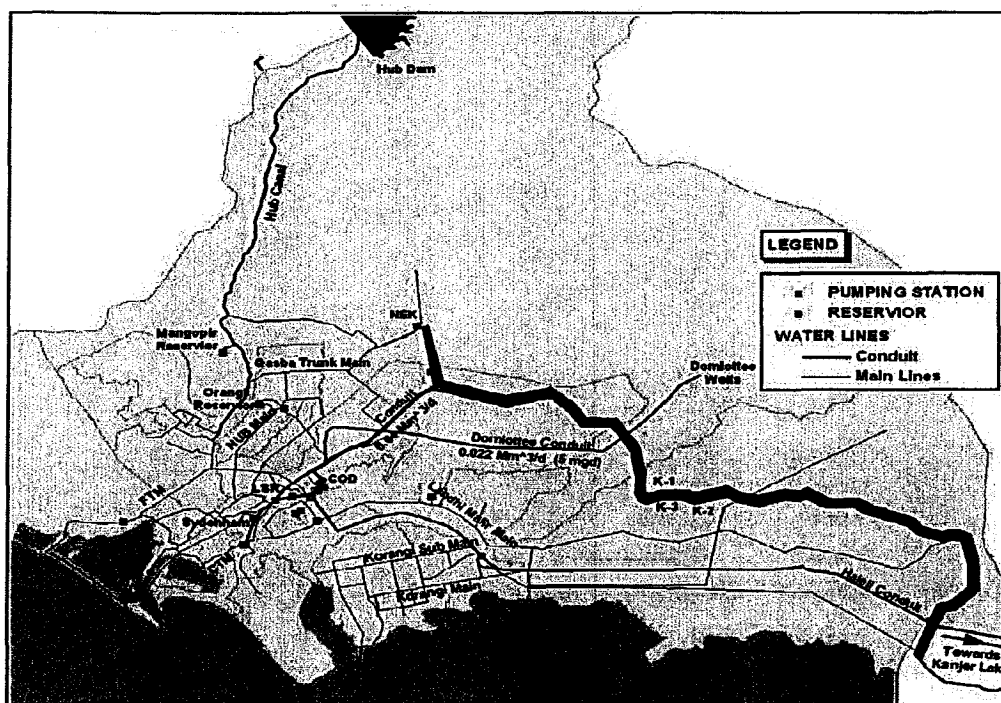
4.10.1 Surface Water Resources

There are no significant natural freshwater sources in the proposed project area. The Indus River is about 85 km to the east of Karachi city and the Hub River lies at a distance of 60 km to the north west of Karachi. A perennial stream that originates from Balochistan and marks the boundary between Karachi Division and Balochistan are the sources of fresh water in Karachi. The Lyari and Malir Rivers that passes through the city do not have any natural flow, except during the monsoons. The Lyari River falls in Kemari and Malir River falls in Gizri Creek. Malir River is ephemeral and is constituted from two major tributaries, i.e. Mol and Khadeji as well as some minor tributaries. Khadeji is a perennial stream that originates at Khadeji falls and gains flow as it travels across the Malir Basin. Port Qasim lies on the inactive and western extent of the Indus delta which is largely arid and swampy; the deltaic coastline associated with Indus Delta is dissected by 17 major creeks and numerous minor creeks. The major creeks of the Indus Delta within the study area include the Phitti, Khuddi and Khai Creeks. Minor creeks, within the study area includes Korangi, Gizri, Kadiro, Issaro, Gharo, Chann Waddo and Rakhal creek.

The Indus River had a river-dominated estuary but due to the increasing demand of fresh water and increasing number of dams and reservoirs the discharge of fresh water to the deltaic region became low which is critically affecting the growth of mangroves and the aquatic flora and fauna. However, the flow of fresh water increases during summer southwest monsoon season. In between 1940s and 1950s embankments were constructed on Haleji and Keenjhar lakes to divert freshwater from Indus River into these lakes and to feed the dry Gharo River. The diverted water again re-enters the intertidal delta within the study area at a distance of 17 kilometers. The water from the Keenjhar Lake is also used for canal-fed irrigation within the eastern side of study area.

The main source of freshwater into the intertidal deltaic creeks of the study area is rain and associated runoff during the summer monsoon. The rainwater drains the land in the north of the study area and joins the intertidal deltaic creeks along the Gharo River, Malir River, ephemeral drains such as Badalnullah, Ghaggarnullah, Latnullah, and Mahyonullah, as well as wastewater drains, particularly into Korangi Creek. The existing water supply network of Karachi is represented as **Exhibit 4.13**.

Exhibit 4. 10:Water supply network of Karachi city



Source: Karachi strategic development plan 2020

4.11 CHEMICAL AND MICRO BIOLOGICAL ANALYSIS OF WATER RESOURCES

Since the key component of the proposed project lies in KCIP, therefore the drinking water was collected from NIP facility and subjected to microbial and chemical analysis in the Lab. The laboratory results of drinking water are presented below in Exhibit 4.14 and Exhibit 4.15.

Exhibit 4. 11: Chemical analysis results of Drinking Water

S. No.	Parameters	Units	SSDWQ	Concentration	Method
1	pH	—	6.5-8.5	7.30	pH meter
2	Total Dissolved Solids	mg/l	1000	322	APHA 2540 C
3	Total Suspended Solids	mg/l	—		Hach Method 8006
4	Chloride	mg/l	250	8.5	APHA 4500 Cl C
5	Total Hardness*	mg/l	<500	134.2	APHA 2340 C
6	Fluoride*	mg/l	≤1.5	0.12	Hach Method 8029
7	Nitrate	mg/l	<50	0.7	Hach Method 8039
8	Nitrite	mg/l	<3	0.002	Hach Method 8507

S. No.	Parameters	Units	SSDWQ	Concentration	Method
9	Sulphate*	mg/l	250	26	Hach Method 8051
10	Bicarbonate	mg/l	–	34	APHA 2320 B
11	Residual Chlorine	mg/l	0.5	0.02	Hach Method 8021

Exhibit 4. 5: Microbial Analysis Results of Drinking Water

S. No.	Parameters	Recommended Value	Results
1	Total Colony Count	<500 cfu / ml	150cfu / ml
2	Total Coliform	0 cfu / 100 ml	3cfu / 100 ml
3	Faecal Coliform	0 cfu / 100 ml	0cfu / 100 ml
4	Faecal Streptococci	0 cfu / 100 ml	0cfu / 100 ml

**Recommended Values as per WHO guidelines for Drinking Water*

4.11.1 Groundwater Resources

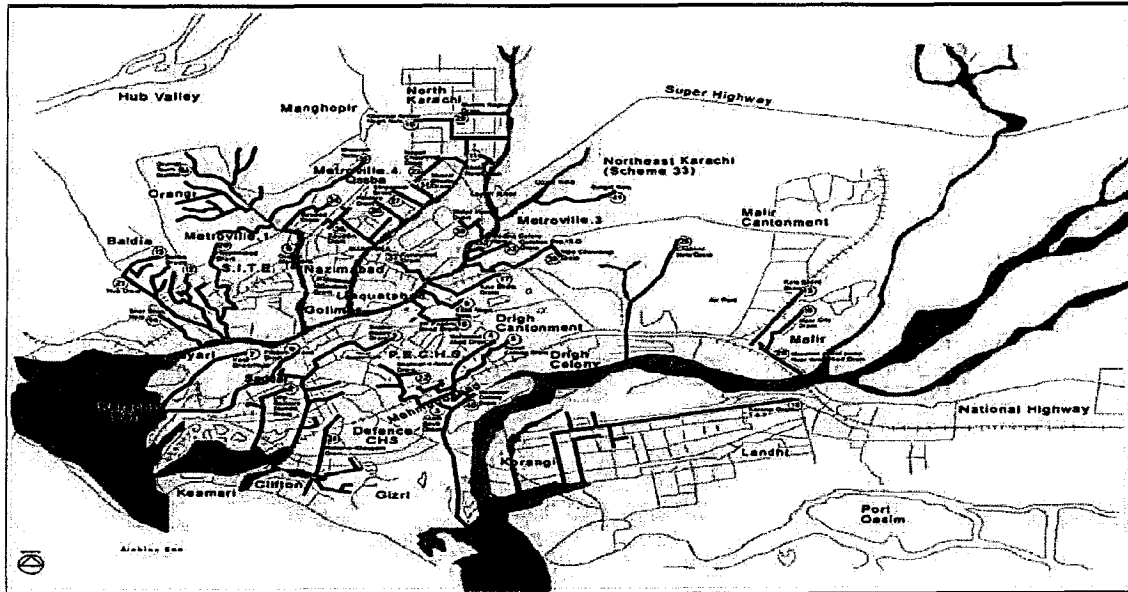
Groundwater resources in Karachi Division are limited. The aquifers close to the coastal belt are mostly saline and dry and this water cannot be used for drinking, domestic and agriculture purposes. Meanwhile the aquifers which lies near the vicinity of the Hub River belt are well developed and is a source of water for agriculture and other domestic purposes. Generally, the aquifers in the proposed project area are estimated to lie at depths of about 30ft to 40ft.

4.12 SURFACE WATER DRAINAGE

The drainage pattern of Karachi is dominated by dendritic. The surface drainage of Karachi City is divided in four parts based upon surface runoff and streams flow.

- ❖ Malir River Basin
- ❖ Lyari River Basin
- ❖ Budnai Basin
- ❖ Coastal Basin

The Malir River basin and the Lyari River basin are two main basins which contribute about 80 percent of the surface runoff. The Budnai basin and the coastal basin are minor basins. All basins collect surface runoff through hundreds of small and large channels which finally drain into sea. The drainage system of Karachi city is shown in **Exhibit 4.18**.

Exhibit 4. 12:Water Drainage System of Karachi

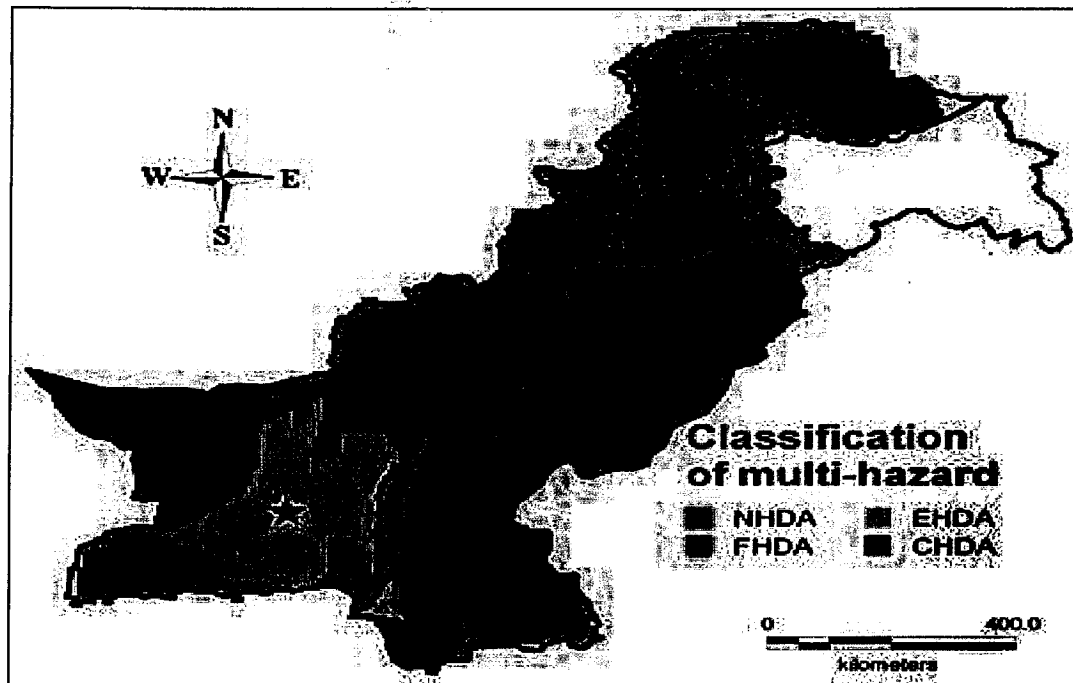
Source: Karachi strategic development plan 2020

4.13 DISASTER RISKS

The province of Sindh has historically suffered from both natural and human induced disasters. The high level of risk is mainly from floods/ heavy rains, cyclones in coastal area, sea intrusion, droughts, earthquakes, epidemics etc.

The multi-hazard map that takes into account various natural hazards identifies this area as earthquake dominant. Hence it verifies that the probability of occurrence of a specific natural hazard is correctly shown in the **Exhibit 4.19**.

Exhibit 4. 13:Classification of multi-hazard zoning map



NHDA : No Hazard Dominated Areas

EHDA:Earthquake Hazard Dominated Areas

FHDA : Flood Hazard Dominated Areas

CHDA : Combined Hazard Dominated Areas

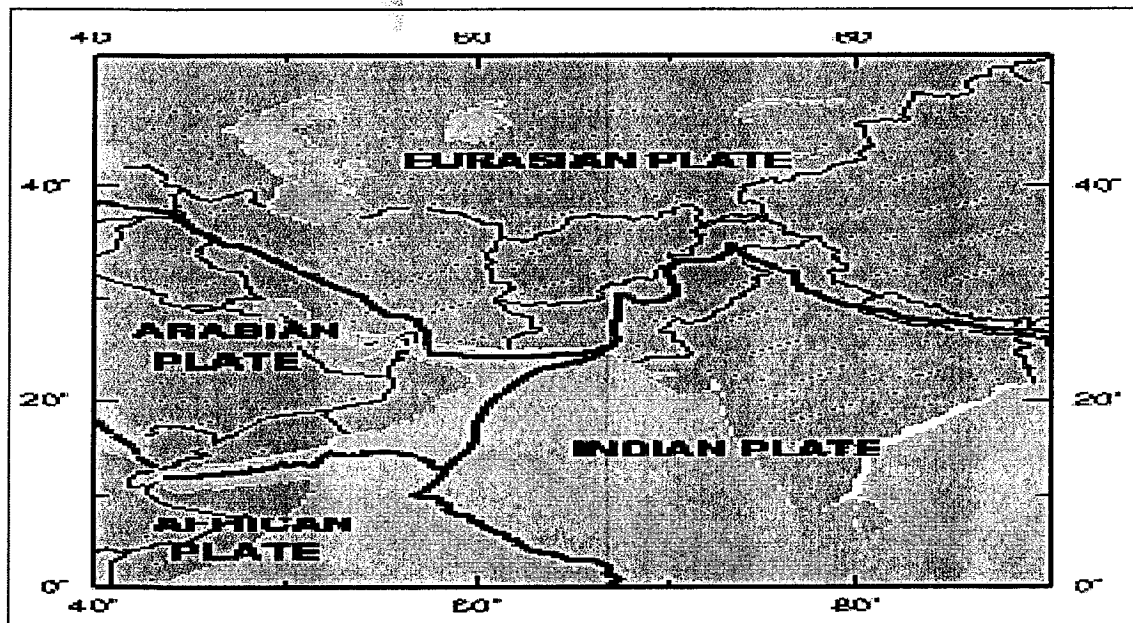
Source:
Siddique,
M.S.
and
Sch

warz, J. (2012): Multi-hazard approach to assess vulnerability of the building stock in Pakistan

4.14 FAULTS, EARTHQUAKES AND SEISMIC HAZARD

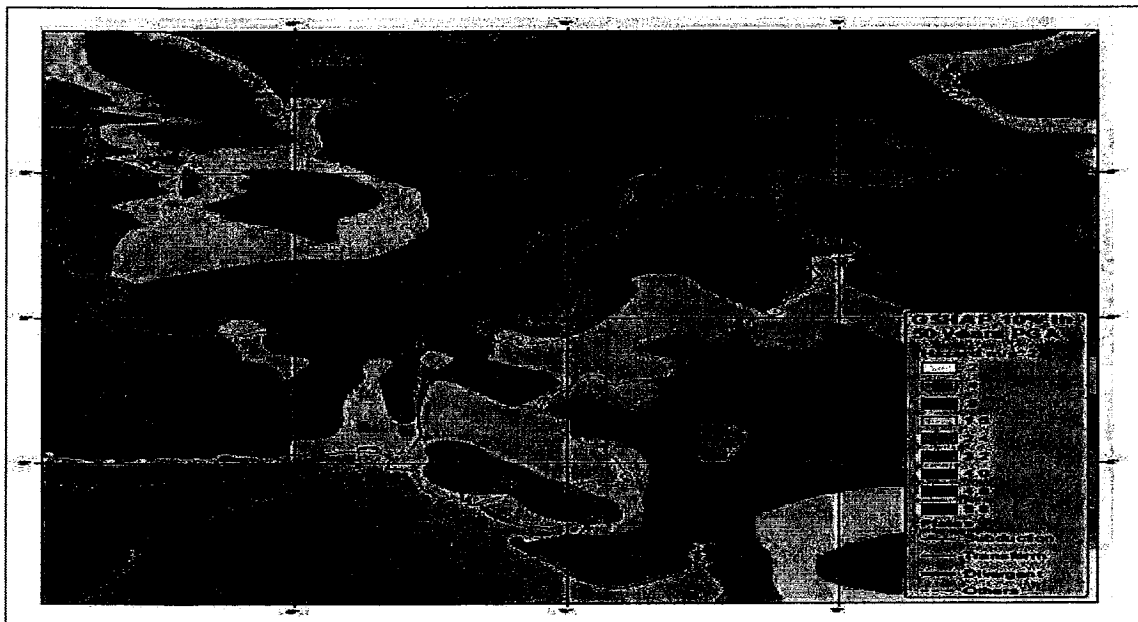
Being located close to the collision boundary of the Indian and Eurasian plates, Pakistan lies in a seismically active zone. Pakistan is located in the Indus-Tsangpo Suture Zone, which is roughly 200 km north of the Himalaya Front and is defined by an exposed ophiolite chain along its southern margin. This region has the highest rates of seismicity and largest earthquakes in the Himalaya region, caused mainly by movement on thrust faults. Seismic zone mapping of Pakistan has divided the country into four seismic zones ranging in term of major, moderate, minor and negligible zones with respect to ground acceleration values. Under this zoning Karachi Division has been identified on the edge of moderate to high hazard zone. This zone has minor to moderate damaging affect. The proposed Project Site KCIP is located adjacent to an active tectonic setting, and is approximately 190 km east of the triple continental junction between the Arabian, Eurasian and Indian plates. The tectonic map of Pakistan is presented in **Exhibit 4.20**Tectonics Map Pakistan

Exhibit 4. 14:Tectonics Map of Pakistan



The study area experiences an earthquake density of less than 1 Richter Scale per year. Earthquake epicenters, for magnitudes between 3.8 and 5.5 ML, have been recorded along the Pab fault, Hab fault, Ornach-Nal fault, smaller micro faults east of Karachi and in the offshore areas southwest of Port Qasim. Based on the Global Seismic Hazard Map Project (GSHAP), the peak ground acceleration (PGA) of 10 % in 50 years is 1.6 m/s^2 . **Exhibit 4.21** represents seismic hazard map of Pakistan.

Exhibit 4.21: Seismic Hazard Map of Pakistan



Source: United States Geological Survey (USGS), "Seismic Hazard Map of Pakistan" (based on GSHAP), accessed 15 September 2014, <http://earthquake.usgs.gov/earthquakes/world/pakistan/density.php>

4.14.1 Flooding

Urban flooding is caused by heavy rainfall overwhelming drainage capacity. Cities have been growing with alarming rate. This problem is important both in developed and under developed Cities like other mega cities of the world flooding has become a serious hazard in the mega cities of Pakistan. The meteorological data of rainfall and hydrological data of surface runoff reveal that occurrence of flood is not the new phenomenon in Karachi. The severe flood occurred in the city, the history of that events and its flow in Malir River were recorded which are shown in **Exhibit 4.24**.

Exhibit 4. 15:History of severe floods in Karachi

Year	Rainfall (mm)	Surface Runoff (000 cubic metres) in Malir River
1930	408.3	209166
1944	676.3	391997
1956	414.2	104164
1959	688.8	330385
1961	621.8	267201
1967	713.0	348451
1970	475.0	172800
1977	489.0	123708
1994	481.0	124178
2007	465.6	118710

Source: Pakistan Meteorological Department and WAPDA

4.14.2 Tsunamis

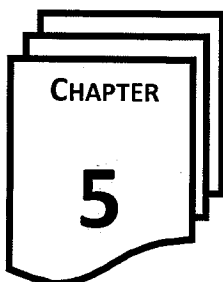
The coastal belt of Pakistan is located in an area of potential tsunami. While large tsunami genetic earthquakes have been relatively rare but there is potential for a tsunami associated with the Makran Subduction Zone (MSZ) or smaller localized tsunamis associated with several smaller thrust faults around Karachi.

Coastal areas of Karachi might experience the effect of Tsunamis as the coast line of Pakistan has had already experienced this natural hazard in the recent past. An earthquake of magnitude 8.3 generated a destructive tsunami wave in the Northern Arabian Sea and the Indian Ocean on 28th November, 1945, producing 12 m to 15 m high sea waves that killed at least 4,000 people in Pasni

and adjoining areas. The tsunami hit as far as Mumbai in India. Karachi, about 450 km from the epicenter, experienced 2 m high sea waves which affected harbor facilities. Hence, the occurrence of tsunami cannot be ruled out in future. The city of Karachi lie close to potential epicenters for large earthquakes and it demands attention of the local government to enhance the capacity for managing disastrous situation, for minimizing disaster risk and response in order to reduce losses from tsunami or other climatic events. The coastal belt of Pakistan is also highly vulnerable to cyclones and associated storm surges. It has been recorded that Fourteen cyclones events had occurred between 1971 and 2001 (NDRMFP, 2007)

4.14.3 Storms and Cyclones

Tropical cyclones also occur periodically in the coastal areas. These cyclones have high intensities. A total of 14 cyclones have been observed which reached the coastal areas of Pakistan since 1971 to 2001. The cyclone of 1999 in Thatta and Badin districts wiped out 73 settlements and killed 168 people and 11,000 cattle's. Nearly 0.6 million people were affected. It destroyed 1800 small and big boats and partially damaged 642 boats, causing a loss of Rs.380 million. Losses to infrastructure were estimated to be Rs.750 million. Climate change may increase the frequency and intensity of storms and could cause changes in their tracks. Although the frequency of cyclones along Pakistan coast belt is low but it can cause a huge damage when it occurs. Hence the possible occurrence of a future cyclone with severe consequences is quite rare but cannot be ruled out (NDRMFP, 2007).



CHAPTER 5

BIOLOGICAL ENVIRONMENT

5.1 GENERAL OUTLINE AND SCOPE

This section gives the detailed description of the ecological environmental conditions of the study area. The proposed project area under review was assessed for its potential impact on Biodiversity, and ecosystem in short term and long term. The data collection techniques are combination of both primary and secondary. Information was collected from field verifications and observations. Experts in the field of terrestrial ecology were engaged in the area of interest from GEMS. The floral and faunal diversity was determined by observations in and around for the area under focus. A hand-held GPS was used to document changes in the ecological assemblages. Data was also supplemented by secondary means, which included review of published literature and previous IEE/EIA studies, conducted in the proposed project surrounding areas. The base line data defines and elaborates the present ecological environmental quality and features of the proposed project surrounding.

5.2 GENERAL HABITATION OF AREA UNDER FOCUS

The proposed project is located in the jurisdiction of KorangiCreek Industrial Park (KCIP).

Exhibit 5.1: Summary of Biodiversity of the project area

Assemblages	Number of Species
Flora	05
Avifauna	09
Mammalian Fauna	04
Herpetofauna	03

5.3 TERRESTRIAL FLORA

5.3.1 Survey/Sampling Methodology for Terrestrial Flora

The area was surveyed by adopting a plot less methodology based on ocular observations was prepared for the proposed project area.

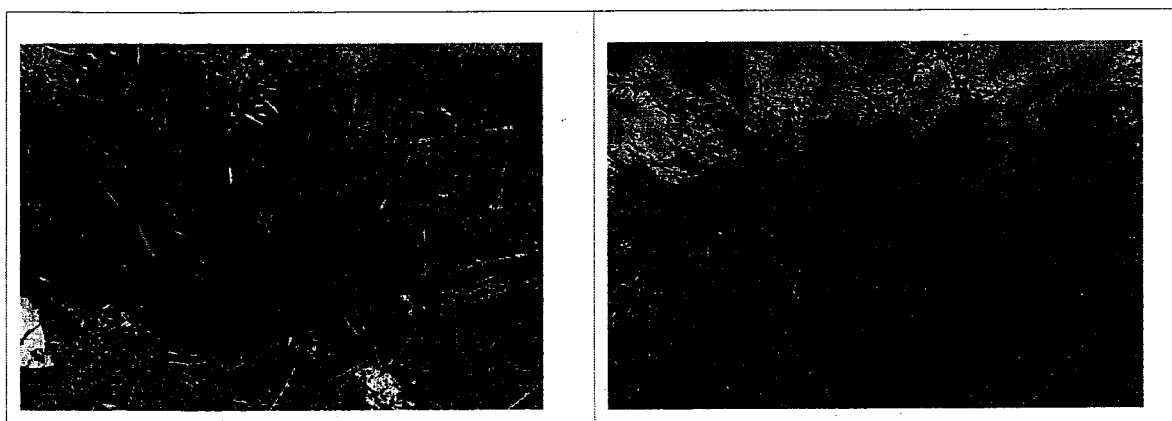
5.3.2 Brief Description

The vegetation is dominated mostly by shrubs; however variations in vegetation composition were observed with varying microhabitats. The associated life forms consisted halophytes belonging to family *Chenopodiaceae*. The other significantly represented members of the floristic list belonged to *Poaceae*, *Asteraceae* and *Zygophylliaceae*. The terrestrial habitat in the Study Area largely consists of arid and dry plain land. No species are present within the facility since it is an already acclaimed land of the proponent. Plant species reported from the surrounding area include Mesquite *Prosopis juliflora*, Indian Milkweed *Calotropis procera* and Caper Bush *Capparis deciduas* the most abundant among these, Mesquite *Prosopis juliflora* is an alien invasive species which is harvested by the locals and sold in the local timber market for fuel wood and construction of local huts. Locals graze their camels on *Mesquite Prosopis juliflora*. The general floristic list observed at the proposed project area is presented as **Exhibit 5.1**, while the pictorial profile of common floral species observed at proposed project area is represented as **Exhibit 5.2**.

Exhibit 5. 1: Floral Species Observed in Terrestrial Habitat of Proposed Project Area

S. No	Plant Species Names	Families Names	Conservation Status
1	<i>Acacia nilotica</i>	Mimosaceae	Not Listed
2	<i>Aerva javanica</i>	Amaranthaceae	Not Listed
3	<i>Azadirachta indica</i>	Meliaceae	Not Listed
4	<i>Atriplex stocksii</i> Boiss	Chenopodiaceae	Not Listed
5	<i>Aeluropus lagopoides</i> (L.) Trin. ex Thw	Poaceae	Not Listed
6	<i>Chloris barbata</i> Sw	Poaceae	Not Listed
7	<i>Calotropis procera</i>	Asclepiadaceae	Not Listed

Exhibit 5. 2: Pictorial Profile of Common Floral Species of the Project Area



*Calotropisprocera**Prosopisjuliflora*

5.3.3 Conservation Status

Based on information available in the EIA/IEE for project in KICP, and literature review, no threatened or endemic terrestrial plant species has been reported from the Study Area. In addition, their distribution is not limited to any specific site or habitat type, and is widespread. Moreover, the area under the control of National Industrial Parks Development and Management and declared as "Protected Forests".

5.4 TERRESTRIAL FAUNA

5.4.1 Survey/Sampling Methodology for Mammalian Fauna

Direct count method was adopted to identify total number of species during the ecological/baseline surveys.

5.4.1.1 Brief Description

Due to urban environment of the proposed project site and its surroundings, there are no proper habitats for breeding mammals to survive except cats, dogs or house mice. However, rodent species which have adopted such conditions are well established using hollow structures or even buildings as their nesting places. Presence of 5-10 mammal species were ascertained at the proposed project site and its surroundings which includes, five striped palm squirrel, house rat and house mouse are the common species of the area while small Indian grey mongoose is less common. **Exhibit 5.3** shows the species of mammals recorded in the proposed project area including their status and listing.

Exhibit 5.3: Mammalian fauna Observed at Project Area

S.No	Common Name	Scientific Name	Occurrence					Listing	
			Common	Abundant	L. Common	Rare	SWPO	Red list	Appendix/ CITES
1	Five striped palm squirrel	<i>Funambuluspennantii</i>	x						
2	House mouse	<i>Mus musculus</i>	x						
3	House rat	<i>Rattusrattus</i>	x						
4	Indian grey mongoose	<i>Herpestesedwardsi</i>			x				III
5	Indian bush rat	<i>Golundaelliotti</i>			x				

5.4.1.2 Conservation Status

Based on information available in the EIA/IEE for project in the area, and literature review, none of the species has been reported from the Study Area as protected, threatened or included in the CITES appendices except the Indian grey mongoose which is listed on CITES Appendix III by India. This species is found in numerous protected areas. Populations are not quantitatively monitored in any country; but the species remains widely and commonly seen in human-dominated areas, indicating a lack of significant ongoing threats and no need for conservation action¹.

5.4.2 Survey/Sampling Methodology for Herpetofauna

The area was surveyed by active examining during the day with the ocular observations. The sampling sites were actively searched for all types of reptiles with a focus on their microhabitats.

5.4.2.1 Brief Description

The specimens were identified with the help of the most recent keys available in literature (Khan, 2006). A low abundance and diversity of the reptiles species has been observed and reported in the study area with small mammals such as rodents, squirrels etc. A total 5 species were recorded during field visit. Most of the reptiles observed were seen associated with vegetation. The most commonly observed reptile species of the study area was the Sindh Gecko *Crossobamonorientalis*. **Exhibit 5.4** represents the species of reptiles recorded in the proposed project area including their status and listing.

Exhibit 5. 4: List of Reptiles observed at Proposed Project Area

S.No	Common Name	Scientific Name	Occurrence					Listing	
			Common	Abundant	L. Common	Rare	SWPO	Red list	Appendix / CITES
1.	Garden lizard	<i>Calotes versicolor</i>	x						
2.	Glossy –bellied Racer	<i>Coluberventromaculatus</i>	x						
3.	Indian spiny tailed lizard	<i>Uromastyxhardwickii</i>	x						
4.	Saw Scaled Viper	<i>Echiscarinatus</i>	x						
5.	Sindh Gecko	<i>Crossobamonorientalis</i>	x						

¹ <http://www.iucnredlist.org/details/41611/0>

5.4.2.2 Conservation Status

Based on information available in the EIA/IEE for projects at the project site, and literature review, none of the species has been reported from the study area as protected, threatened or included in the CITES appendices and IUCN Red List 2014.

5.4.3 Survey/Sampling Methodology for Endemic Birds

To estimate avifaunal diversity of the proposed project area individual count technique was used by using binocular spotting technique during field surveys and the identified species were immediately recorded and reported accordingly.

5.4.3.1 Brief Description

Both water and land birds have been reported from the project site. Most of these birds are omnivores while others scavenge on marine crabs and dead fish. It is important to note that due to seasonal variation all the reported avifaunal species of the project area were not sighted during the field surveys therefore additional support from previous EIA/IEE studies was taken in this regard. The avian species, which are quite abundant and common in the project area, include Indian Roller, Green Bee Eater, Indian Myna, Jungle babbler. A detailed list of identified avifaunal species is presented as Exhibit 5.5.

Exhibit 5. 5: List of Avifaunal Species observed at Proposed Project Area

S. No	English Name	Scientific Name
1	Blue Rock Pigeon	<i>Columbia livia</i>
2	Black Drongo	<i>Dicrurus macrocecercus</i>
3	Black Tailed Godwit	<i>Limosalimosa</i>
4	Black Winged Stilt	<i>Himantopus himantopus</i>
5	Black-bellied Plover	<i>Pluvialis squatarola</i>
6	Common babbler	<i>Turdoides caudatus</i>
7	Hoopoe	<i>Upupa epops</i>
8	House Sparrow	<i>Passer domesticus</i>
9	Indian Ring dove	<i>Streptopelia decaocto</i>
10	Indian Myna	<i>Acridothera tristis</i>
11	Indian Roller	<i>Coracias benghalensis</i>

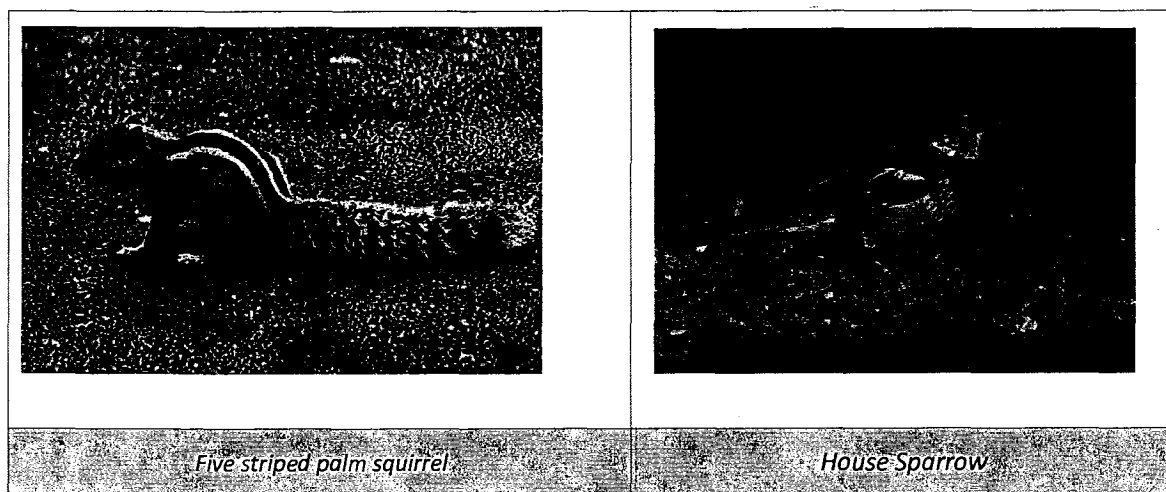
S. No	English Name	Scientific Name
12	Pariah Kite	<i>Milvus migrans</i>
13	Red wattled Lapwing	<i>Vanellus indicus</i>
14	Rose ringed parakeet	<i>Psittacula krameri</i>
15	Sind-tailed Bee-eater	<i>Merops orientalis</i>
16	Sindh House Crow	<i>Corvus splendens</i>

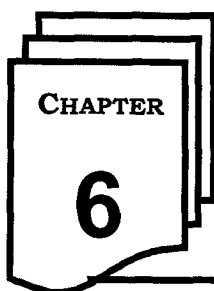
5.4.3.2 Conservation Status

Based on information available in the EIA/IEE for projects in KCIP, and literature review none of the species are protected under the Sindh Wildlife Protection Ordinance (SWPO) and IUCN Red List 2006 as Near Threatened (NT).

The pictorial profile of terrestrial fauna observed at proposed project area is represented as **Exhibit 5.6**.

Exhibit 5. 6: Terrestrial Fauna of the Proposed Project Area





SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

5.1 GENERAL OUTLINE AND SCOPE

A team comprising a sociologist and environmental assessment specialist carried out the study of socio economic and cultural environment within the project area. The approach and methodology during data gathering was a combination of qualitative and quantitative techniques. The data collection addresses the primary requirements of an Initial Environmental Examination (IEE), incorporating the Pakistan Environmental Assessment Procedures 1997.

A Participatory Rural Assessment was combined with the extensive qualitative data collection of socio-economic and cultural data through short structured questionnaires and focus group interviews with communities including men and key male informants in project surrounding areas within 5 km radius of project vicinity. The relevant and accurate information was obtained with efficiently in terms of time and area coverage by rapid cycles of interaction among team members, communities and area elders. The specific tools used for collection of data includes, direct observation, short questionnaire, focus groups and semi-structured interviews. A brief of socioeconomic features of the project area is given in **Exhibit 6.1** in the end of this chapter.

6.1.1 PROJECT LOCATION AND ADMINISTRATIVE SETUP

The proposed power Plant will be installed Plot # WH-01-20-A7-A8,in Korangi Creek Industrial Park (KCIP), the National Industrial Parks (NIP), a subsidiary of PIDC, launched the Korangi Creek Industrial Park (KCIP) project in the Korangi Creek cantonment in 2010.Now it's been developing the world-class industrial park that offered a one-window operation. This industrial park was envisioned to have all the basic amenities/ utilities at the doorstep to facilitate establishment of industrial units.

The detail of supporting infrastructure can be seen in Exhibit 6.1

Location	Sector 38, Korangi Industrial Area, Karachi, Sindh	
S.NO	Supporting Infrastructure	Description
01	Industrial Clusters	Low Density Zone: Light Engineering, Food Processing, Consumer Food & Pharmaceutical Products, Garments / Value added Textiles, Packaging & Printing

		<p>& Warehousing/Logistics (G + 4 Allowed) 0.5 to 1 Acre</p> <p>High Density Zone: Commercial and Business Centers, Information Technology, Gems & Jewelry (G + 19 Allowed) from 0.5 Acre</p>
02	Connectivity	<ul style="list-style-type: none"> Karachi Sea Port 22 km I.I. Chundrigar Road 13 km Quaid-E-Azam International Airport 20 km Super Highway 30 km National Highway 34 km
03	Special Economic Zone Benefits	<p>SEZs will have exemption from custom duties and taxes for all capital goods imported into Pakistan</p> <p>Exemption from all taxes on income accruable in relation to the development and operations of the SEZ for a period of ten years.</p>
04	Water Supply	Karachi Water and Sewerage Board (KWSB)
05	Power Supply	Captive Power Plant
06	Telecommunication System	Telephone Lines with Broadband wireless internet connectivity
07	Gas Supply	Sui Southern Gas Company (SSGC)
08	Roads	Major and minor arterial roads, Utility corridors and sidewalks, Green belts and median for street lighting
09	Other Features	Effluent Treatment Plant, Solid Waste Management, Transport Hub, Weigh Bridge, Vocational Training Center, One Stop Service
10	Services Building	Banks, Insurance Offices, Post Office, Auditorium, Exhibition Hall, Food Court, Emergency Medicare Facility, Recreational Center etc.
11	Security	Secured Boundary Wall with controlled entry and exit with internal patrolling

12	Present Status	Fully functioning administrative and site office, Boundary wall completed Water distribution network with underground and overhead reservoirs, pumping station and generator house completed, Underground sewerage network completed, Laying of electrical distribution network and sub-stations is in progress
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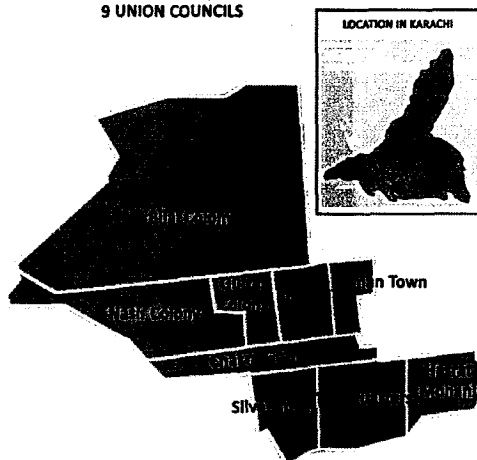
(Source: National Industrial Parks Development & Management)

6.1.2 Korangi Industrial Area

Korangi Industrial Area consists of medium and large size industries. The industrial area houses many industries like Textile, Steel, Pharmaceutical, Automobile, Chemical, Engineering and Flour Mills. The total number of industries in Korangi Industrial Area is approximately 4000.

Korangi Town is one of the 18 towns of the City District Government. Proposed p Site falls in UC (5), in Korangi town. It is a town in the eastern parts of Karachi, Pakistan, south of the Malir River. Karachi division is divided into five districts, Karachi West, Karachi East, Karachi South, Karachi Central and Malir. Karachi East, Karachi South and Karachi Central are entirely urban areas, where as Malir and Karachi west have both urban and rural populations.

KORANGI TOWN, KARACHI
9 UNION COUNCILS



6.1.3 Korangi Town

Korangi Town is bordered by Faisal Cantonment and Shah Faisal Town to the north, Bin Qasim and Landhi to the east and south, Korangi Cantonment to the southwest and Jamshed Town to the west across the Malir River. According to census 2017 total population of District Korangi is 2457019. In Total population males are 1284015, female are 1172737 and Shemale / Transgender are 267. Average annual growth rate is 2.41 from 1998 to 2017. The population of Korangi Town was estimated to be about 550,000 at the 1998 census.

6.1.4 Entry and Exit Points

The major entry and exit road into the project area is the Korangi creek road. One can easily get local public transport (Bus, Mini Bus etc) and taxis to any part of Karachi.

6.1.5 DEMOGRAPHIC AND WELL BEING INDICATORS

6.1.6 Demographics

Karachi is one of the world's most populated cities, spread over 3,530 square kilometers. The city credits its growth to the mixed populations of economic and political migrants and refugees from different national, provincial, linguistic and religious origins that largely came to settle here permanently. Similarly, in this area migrants from all over the country have settled dating several years back. In total four areas were visited in the vicinity of Akhtar Textile Industries Pvt, Limited (2 Km radius). Most of the target areas were densely populated. People living in these areas have migrated from their original areas in search of employment and have been settled here permanently.

6.1.7 Networking and Communication

The major and prominent place of the area is Korangi Crossing which is link to Korangi Creek road and Landhiroad. These road channelized to DHA, Landhi, Korangifish harbourand Port Qasim city.All the target areas have close and regular links to these Chowrangi for business, health facilities and transportation. Small shops were also available inside the localities of the target area. All the areas have metallic roads and were linked to Korangi Industrial Area but in somewhere broken condition.

Most of the people in this area use their own or public transport to access Brookes Chowrangi. There are various modes of transportation available in the target area. There are buses, wagons, rickshaws, taxis etc available for travel inside the city. A reasonable number of bicycles and motorcycles were also visible in the project area. The use of mobile phones and internet for communication is very much common in the area.

6.1.8 Leadership Dynamics

Any strong system of leadership was not observed in the project area. Most of the areas have mix population, so there is not any common leadership available. Every sect has their own leader. The minor conflicts are resolved at Mohalla level by some senior, respectful person, however if the conflict is big and complex, the community approach UC secretary or "Punchayat Committee". Sometimes the conflicts are reported to Police.

6.1.9 Spiritual Leadership

Majority of people (70%) belong to Sunni sect of Islam and around 30% were reported to belong with Shia sect of Islam. Some people of this area visit Dargahs in Sindh and Punjab, but not regularly. Some of them also visit the shrine of Abdullah Shah Ghazi in Karachi. There are a few shrines also observed in the different colonies. However the mosques were available in almost every colony. People contact Darul-Alum or mosque molvi in case of some clarification or getting advice on any religious matter e.g. marriages, zakat, business, interest related financial mattersetc.

6.2 LIVELIHOOD

The livelihood of the people in project area mainly depends on labor in nearby industries, Jobs and small business. The residents of, Allah Wala Town, Darussalam Society and Bhattai colony are involved in jobs, labour ship in nearby industries and to some extent small business like running hotels and shops related activities. Most of people are engaged in casual labor on daily wages basis. Some others work in factories and shops. Some people of this area have their own small business i.e. shops etc. A few people in the project area were found extremely poor and they earn their living by collecting valuables from the waste dumps.



Sui Gas is available in the area and all families use this facility for cooking purpose. Electricity is also available and basic electric items i.e. Fan, Tube lights, TV, Washing Machine are available in most of the houses of the area. Some people also have expensive electric items e.g. Fridge, AC available in their homes.

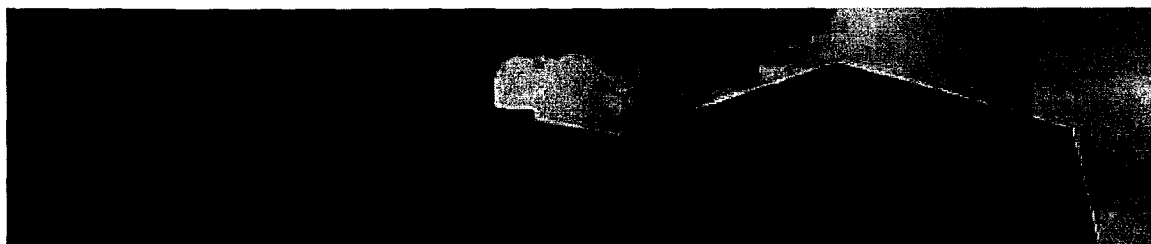
6.3 DRINKING WATER

The source of drinking water in the project area is through water supply but its supply is inadequate. Some people use underground water which is found to be brackish in nature and completely unfit for drinking purpose. Several people are buying the water on daily or weekly basis. One jerry cane costs Rs. 30 to 50, whereas water tanker having the capacity of 1500 to 2000 gallons costs Rs.2500 to 3000. Some household boil drinking water before drinking and some purchase filtered/mineral water.

6.4 EDUCATION

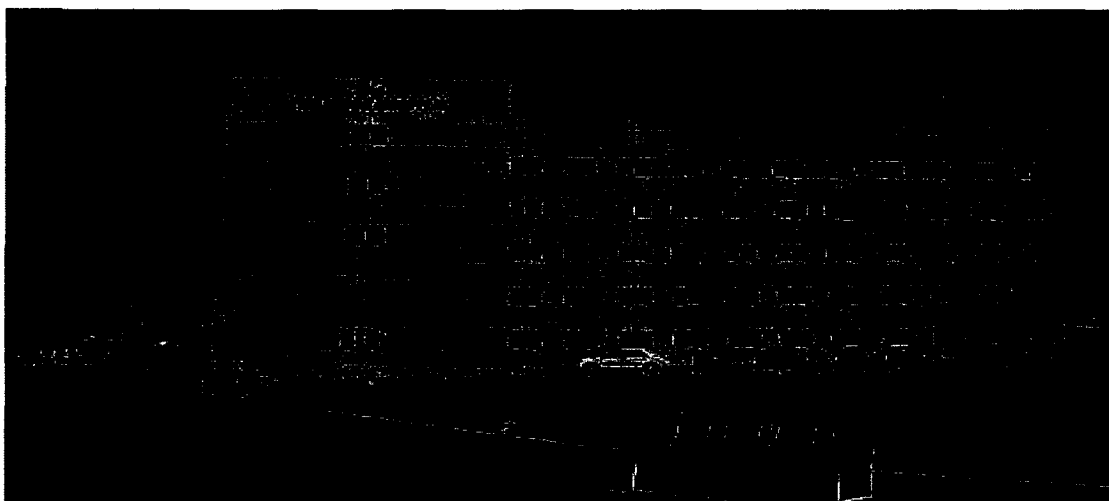
Educational facilities are available in the areas covered due to commercialization of education and active role of private sector. Private organizations have all taken part in providing educational facilities. The various type of schools e.g. government, and private were reported in the target areas. However few elite class higher educational facilities are also located near the project locality, including the College of Business Management Karachi as well as United Medical and Dental College.

6.5 HEALTH & SANITATION



Likewise education institutions, the health facilities provided by the government are also of lower quality in the project area. However it was noted that different health units were located in the project area. About 8 to 10 private clinics are also present within the project vicinity. People visit Indus Hospital, Bilquees Hospital, Fazal-E-Illahi Hospital, Sindh Government Hospital Korangi No. 5, Sindh Government Hospital (Baber Market) and Jinnah Hospital in case of some serious problem. The major health problems of the area are TB, Malaria, Fever and water borne diseases including Hepatitis, Diarrhea, Gastroenteritis, and Fever.

The sanitation conditions are not satisfactory. There is no proper sewerage system; hence most of the houses have open channel "Nallahs" in facing. Neither government nor industries or community based organizations are paying any serious attention towards it. These areas have become a source of several diseases.



6.6 NON GOVERNMENTAL ORGANIZATIONS (NGOS)

The emergence of a vibrant civil society in Sindh can be gauged by the increasing visibility of such organizations and their impact. The expanding advocacy role of NGOs has been recognized by the state. As intermediaries, NGOs have established channels of communication and cooperation between communities on one hand, on the other hand, government institutions and funding of any major NGO was not found in the project area. However there were nominal



social welfare associations at community level working for the welfare of people on small scale.

6.7 CULTURE

Even though people of this area originally belong to various parts of the country, but they have adopted the urban culture of Karachi. The everyday lifestyle of Karachi differs substantially from that of other Pakistani towns. The culture of Karachi is characterized by the blending of Middle Eastern, South Asian and Western influences. There is considerable diversity in culture, and this diversity has produced unique cultural amalgam of its own type. Karachi also hosts the largest middle class stratum of the country. People of this area also practice their original cultural norms.

The increasing cost of living and the availability of employment in the big cities of Pakistan have contributed to a mass exodus of Pushtuns from the rural areas into the cities. There are said to be over 2 million Pushtuns in Karachi alone. Central to identity as a Pushtun is adherence to the male centered code of conduct, the pushtonwali. Women are restricted to private, family compounds in much of the Pathan families, most of the pushtun men working in Karachi leave their wives and daughters at home in the village. But there is a large number of Pathan who has been migrated to Karachi along with their families.

6.8 GENDER ASPECT OF THE PROJECT AREA

Data regarding gender aspect of socio economic study was collected by interviewing local females in Allah Wala Town, Darussalam Society and Bhattai colony. A questionnaire was filled by Focus Group Discussions (FDGs) to collect information with regard to demographic and economic indicators and individual interviews were carried out in different places e.g. Houses, College, Schools, and Clinics etc.

6.8.1 Daily Routine of Women

In Karachi, life is a blend of busy working style. For this project colonies of the surrounding to proposed site were visited. These areas are populated with different cultural communities of the country. During survey it was noted that the women of the project area are very hard working and practical. They normally look after all the household chores from dawn to dusk including making breakfast, cleanliness of home, dish washing, washing the clothes and looking after children and livestock.

Some females also involve in income generation activities e.g.

- Factory Worker.
- Beautician.
- Maids and Teachers etc.

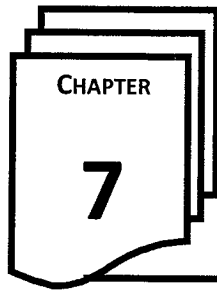
Most of the women in the project area are mainly associated with stitching and embroidery for their source of living.

6.9 PUBLIC CONSULTATION

Locals of the project area were also consulted in order to consider their viewpoints regarding the proposed project, short interviews were made so as to extract positive as well as negative reviews regarding the proposed project. However it was noted that majority of the people had positive comments regarding establishment of proposed projects as this will provide new horizon for employment opportunities as there are number of skilled but jobless people in the area.

Exhibit 6.1: Socioeconomic features of the project area.

Well Being Indicator	Korangi Town
GPS Coordinates	24°47' 52.49" N 67° 06' 23.13" E
Major Communities	Urdu-speaking, Pakhtoon, Sindhi, Baloch
No. of Houses	182168 approx.
Population (2014)	1,093,008 approx.
Livelihood	Transport, Labor, Millers, Shop keepers
Electricity	Available
Fueling Source	Available
Major Institutions	Iqra University, IoBM
Literacy Rate	Low
Drinking Water	Tankers system, groundwater, KWSB
Major Health Problems	Malaria, GIT, hepatitis and Lungs Diseases
Health Facilities	Fair
Major Hospitals	Indus Hospital, Korangi Eye Hospital, Jinnah Medical College Hospital
Major Needs	Govt. hospitals. Modern Schools, Safe Drinking Water, Continuous Electricity, Solid Waste and Wastewater Management System
Major Markets	Imtiyaz Supermarket
Transport	Public and Private Transport, Motorcycles, Rickshaws



ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

7.1 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the potential environmental and social impacts of the proposed activities, predicts the magnitude of the impact, assesses its significance and recommends mitigation measures to minimize adverse environmental impacts. The discussion starts with a description of the methodology used for the impact assessment. Discussion of the environmental and socioeconomic impact is then organized in the following manner:

- Impacts associated with construction phase
- Impacts associated with operational phase

7.2 IMPACT ASSESSMENT METHODOLOGY

Potential impacts from the proposed project activities were identified by review of the project activities, study of surrounding environment, review of literature, review of previous similar studies and expert judgment. Once potential impacts have been identified, the assessment of each potential impact follows these steps:

7.3 ENVIRONMENTAL IMPACTS ASSOCIATED WITH CONSTRUCTION AND OPERATIONAL PHASE

7.4 Land Use and Soil

Potential Issues

The proposed site for Construction of new building will not involve any mega impact on land as fabricated steel structure will be installed for developing building for facility for this few meter of land needed to be excavated for developing foundation ; therefore no potential issues were identified. However the impact may arise by leaching of oils& other lubricants etc to the soil, it should be noted that such kind of impact will only arise in case of spills or leakages of such lubricants and soil may get contaminated. Moreover, excavation activities for laying of foundations of building structure may result in soil erosion. During operational phase may not be adverse impacts on soil as facility doesn't include oil and diesel storage tanks.

Existing Conditions

The existing conditions are already discussed in Chapter 4.

Criteria for Determining Significance

There are no standards in Pakistan for maintaining the physical, chemical, or biological properties of soil. An adverse impact on the land will be interpreted if the land as a result of the project activities becomes unsuitable for the purpose for which it was originally intended.

Impact Analysis

The most significant impact will be the changes in the soil structure and degradation of soil quality as a result of erosion and compaction. Moderate amount of soil will be eroded during excavation and laying of foundations. However, cumulatively it is expected that there will be no significant impact on soil. The soil quality will be primarily checked by the contractors and civil works will be done accordingly. Quality of soil may be adversely impacted in case of accidental spill or leakages of oils and or other lubricants.

On the other hand it is important to note, that the impact is only associated with construction phase which may include: excavation, accidental spillage of oils and other lubricants or chemicals used during construction phase

Mitigation Measures

- The construction activities will be planned to minimize disturbances to soil;
- Only limited area should be excavated which is required for laying foundation
- All possible chemicals, lubricants, adhesives, paints etc must be stored at an impermeable area where leakage or leaching in soil is completely ruled out;
- Use of such liquids will be monitored and recorded on site;
- Movement of heavy vehicles, which are expected to carry heavy machinery for proposed construction sites will be restricted to marked pathways only and unnecessary movements will be avoided to reduce soil disturbance;
- Regular inspections will be carried out to detect leakages in construction vehicles, equipment, and storage tanks;
- Appropriate arrangements, including shovels, plastic bags and absorbent materials, will be available near fuel and oil storage areas;
- Contaminated soil will be removed and properly disposed after treatment such as incineration or soil remediation technique etc.

7.4.1 Air Quality

The conditions that may alter air quality on temporary basis will only be limited to the construction phase; this may include dispersion of soil during excavation and compaction activity and gaseous emission from vehicles and machineries. Dust and gaseous emission during civil works are usually anticipated due to extensive nature of construction activities which include vehicular and material movements.

- **Particulate matter**

Dust emissions will cause Particulate matter to disperse in the environment. This may occur due to excavation activities, vehicular movement on unpaved areas and improper piling or stacking of raw materials.

- **Other Emissions:**

The loaders & lifters that are expected to be used in construction phase may result in gaseous emissions to air if not tuned or maintained properly. No extra Generator will be use during any phase; electricity will be used from self-generation capacity generators.

Existing Conditions

The existing ambient air quality has been discussed in **Chapter-4**.

Criteria for Determining Significance

There will be no long term significant impact on air quality. Since the proposed project does not included heavy construction activity and civil works will be completed within a limited time scale, as readymade steel building will be mounted on project site. In both construction and operational phase, a significant effect on the environment will be interpreted if there is an increase in visible dust or emissions beyond the boundaries of the proposed project site due to activities undertaken at site

Impact Analysis

Potential issues of particulate matter emission may arise from dust emission by Vehicle and machinery movement, excavation activity and compaction of land during construction phase. However during operation phase the generator will be the only source of gaseous emission.

Mitigation Measures

- Installation of proper exhaust systems and fans will be ensured prior to paint activities in order to reduce the exposure probability of VOCs in the ambient environment; this would also reduce the severity of health effects.
- Machineries involved in power generation should be tuned so VOCs maintained

- It should be ensured that all the vehicles, machineries and or generators that may be used in future will be properly tuned in order to reduce the probability of other emissions.
- Emission reduction techniques should be employed on a regular basis.
- Sprinkling of water on unpaved areas will be done so that less dust emissions are emanated from vehicular movement.
- Speed limits must be kept at minimum.

Residual Impacts

The effects of the VOCs and particulate matter nuisance are temporary with no long lasting impact expected after the completion of proposed project.

Monitoring Requirements

- Periodic monitoring of stack emissions from the generators will be carried out and recorded to ensure continued compliance with SEQS.

7.4.2 Noise Level

Depending on the construction equipment used and its distance from the receptors, the commuters travelling on the road and the nearby industries may exposed to intermittent and variable noise levels however the chances of locals getting exposed to noise is quite low since the project activities would only be limited within premises..

In general, human sound perception is such that a change in sound level of 3dB is just noticeable, a change of 5dB is clearly noticeable, and a change of 10dB is perceived as a doubling or halving of sound level.

Potential Issues

No potential issues are comprehended. However, noise levels during construction works might be elevated which may affect the workers themselves. Therefore, care must be taken during the works.

Existing Conditions

Furthermore, it is located in KCIP area where large spaces are provided between industries and no immediate communities exist which may be impacted from the noise.

Criteria for Determining Significance

The World Bank for noise guidelines requires that the sound level in industrial and commercial areas should not exceed 70dB (A). An alternate criterion is the World Health Organization (WHO) guidelines. The maximum noise level is important when there are distinct events to the noise. SEQS

levels for industrial zones vary 85 dB according to time of day. As far as SEQs limits for the time of night is vary 65 dB.

Impact Analysis

The cumulative effect of the baseline noise scenario that may be exhibited from project activities was only limited within the enclosed boundary. Moreover, during the operational phase the workers may get exposed to escalated levels of noise while working within the site.

Mitigation

The following mitigation measures are recommended in order not to further exceeding the noise due to construction activities:

- Use noise-abating devices wherever needed and practicable.
- Immobile machinery which may generate noise should be placed in enclosed rooms.
- It should be ensured that noise generating from one unit will be prevented by means of suitable noise absorbers such as UPVC doors (Unplasticized polyvinyl chloride) which reduces noise up to 75 dB (A)
- Vehicles must be tuned and maintained to reduce their noise levels.
- Civil works must be planned such that all works are in a sequence and no cumulative effect is formed which may escalate noise levels altogether.

Residual Impacts

If proper mitigation measures are followed the noise from the construction and operational activities is expected to be within the allowable, SEQs therefore no residual impacts are expected.

Monitoring Requirements

Periodic monitoring of noise level will be carried out and recorded to ensure continued compliance with SEQs.

7.4.3 Water sourcing

Water during the construction activity will be required for the concrete mixing and for wetting the fresh concrete structures etc. at the construction site as well as water sprinkling for dust suppression. The use of water for construction may affect water availability for other users if water is not taken from existing factory water supply. Moreover the leakages, spillages and improper handling of oil, lubricants and other solid hazardous waste may have adverse impact on underground water. To minimize these impacts following mitigation measures should be followed. However during the operational phase water may be used in electricity production processes.

Potential Issues

The use of water during construction phase will be limited to batching of construction material, sprinkling on materials and unpaved areas as well as for domestic use such as, cleaning, sweeping, ablution, and/or drinking purposes. The potential issue that may arise is unsustainable use of water on the other hand seepage of oil and lubricants from proposed project sites may result in ground water contamination.

Existing Conditions

The existing water resources of the proposed site and its surroundings have been discussed in Chapter-4.

Criteria for Determining Significance

An adverse impact on the water resources will be interpreted if it is established that the water use during constructions inflicts shortage in supply of KWSB& Tanker supply to the area.

Impact Analysis

The water requirement for the construction phase will not affect the water availability for other water users as most of the water will be taken from existing water supply and Ground water will augment its water supply to the area to cater for the water requirements of the project. Moreover adherence to the below mentioned mitigation measures will further ensure efficient use of water.

Mitigation

Following mitigation measures will be incorporated to minimize any impacts.

- A complete record of water consumption during construction and operational phase will be maintained;
- Water conservation program will be initiated to prevent wastage of water;
- The water supply lines will be checked and repaired for leaks in order to reduce wastage of water;
- Ensure that water efficient sanitary fittings are used throughout the development e.g. low flush toilets, efficient cleaning showers etc.
- Ensure that contractor will follow OGRA (NFPA 30) guidelines for construction of oil storage tanks to prevent any seepages or leakages.

Residual Impacts

Residual impacts are foreseen to be negligible / low in this case if recommended mitigation measures are adhered with.

Monitoring Requirements

- Water consumption during the construction and operational activities will be monitored and recorded.

7.4.4 Traffic***Potential Issues***

It is expected that traffic load will remain unaffected, during construction and operational phase as the project activities will be limited within the existing terminal premises.

Existing Conditions

The traffic is mainly comprised of cars, buses heavy trucks and tankers. The traffic flow is more or less uniform during the peak hours of the day for instance from 9:00am to 9:00pm. However there is a significant reduction in traffic at night with a minimum traffic flow occurring during the hours of 3:00am to 7:00am.

Criteria for Determining Significance

A significant impact will be interpreted if the additional operational phase traffic results in traffic congestion and becomes a hassle for the existing road users. But it is the industrial park of Karachi as traffic should be managed accordingly.

Impact Analysis

During the construction and operation phase the workers and laborers will use the following road networks, main Korangi Industrial Area (KIA) Karachi.

Mitigation Measures

The following mitigation measures will be incorporated to prevent traffic congestion:

- It should be ensured that employees park their vehicles within the parking area designated for parking within the industry to reduce the probability of traffic congestion and disturbance to the neighbouring industries.
- Designate construction vehicles to follow pathways and proper parking plans during complete construction phase.

Residual Impacts

Implementation of the proposed mitigation measures is not likely to leave any residual impact.

7.4.5 Wastewater Generation

Potential Issues

There will be almost no waste water associated with construction activities and operational phase. In addition to that no waste water will be produced during construction phase as there is no involvement of water use at any stage of construction. However waste water will be generated during operational process making sludge form & domestic activities only, including sewage water which is usually drained into sewage lines directly.

Criteria for Determining Significance

A significant impact on the environment will be interpreted if the wastewater discharged is not in compliance with the SEQS for municipal effluent if discharged offsite. Or improper discharge onsite causes odour nuisance, and health hazard.

Impact Analysis

The source of wastewater will include toilets, power plant process & washrooms. The collected sewage generally consisting of sanitary & Sludge wastewater will be routed to a municipal drain/sewerage system.

Mitigation Measures

The following mitigation measures will be taken:

- Wastewater generated should be routed to industrial park waste water treatment plant.
- Proper channel and pipeline must be used for drainage of waste water.
- Takes action if the generated waste water is not met the SEQS limits, then needs to install WWTP or ETP.

Residual Impacts

Implementation of the proposed mitigation measures is not likely to leave any significant residual impacts.

Monitoring Requirements

Monitoring is required in this case the generated waste water are heavy pollution load in water bodies.

7.4.6 Solid Waste Generation and Management

a. Solid Waste Generation and Management during Construction Phase

Potential Issues

The construction phase of the proposed project is expected to generate wastes including; packing waste; scrap, excess construction materials and debris, empty containers and drums, used lubricating oils, Sludge, and chemicals etc. Besides being an eyesore, the waste can also pose a health hazard; pollute soil, surface and ground water if disposed of improperly.

Criteria for Determining Significance

A significant impact will be interpreted if the waste management is not carried out properly during installation and operational phase; which may effect to health of workers, pollution of soil, surface or groundwater:

- Excessive wastes are generated, recyclable waste is not recycled, waste are scattered, handling of wastes results in contamination, and wastes are improperly disposed of causing pollution.

Impact Analysis

Majority of the construction material to be used and waste generated as a result of construction activity will be inherently less reactive and chemically inert under normal conditions however, its handling and storage may pose adverse impacts of minor nature which could easily be controlled by employing the recommended mitigation measures in this report.

Waste from construction and associated activities by all the project contractors will be properly managed by proposed controls discussed in the following section.

Mitigation Measures

A waste management plan will be developed before the start of the construction activities. Key elements of the waste management system will be the following:

- Separate bins will be placed for different type of wastes - plastic, paper, metal, glass, wood, and cotton;
- Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling;
- No waste will be dumped at any location outside the proposed site boundary;
- All hazardous waste will be separated from other wastes. Hazardous wastes will be stored in designated areas with restricted access and proper marking. Hazardous wastes will be disposed of through approved waste contractors;
- Surplus construction materials including partially filled chemical and paint containers will be returned to suppliers. Inert construction wastes will be sold as scrap to contractors;

- Record all waste generated during the construction period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register;
- Training will be provided to personnel for identification, segregation, and management of waste.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from waste is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

The monitoring measures will include:

- The proposed construction site will be periodically inspected to verify that no project related waste is scattered in these areas.
- Waste management inspection will be undertaken on a regular basis of on-site waste management and of waste disposal contractors to ensure that the waste management procedures are being followed.

b. Solid Waste Generation and Management during Operational Phase.

Potential Issues

The solid waste generated during operational phase will be hazardous in nature.

Criteria for Determining Significance

A significant impact will be interpreted if the waste management is not carried out properly; which may affect the health of employees, pollution of soil, surface or groundwater, excessive wastes are generated, recyclable waste are not recycled, waste are scattered and not segregated, handling of wastes results in contamination, and wastes are improperly disposed off causing pollution.

Impact Analysis

The solid waste generated can again be categorized as hazardous. The former type will mainly consist of

- Waste generally comprising of Sludge, Luboil, Exhausted Gas, chemical bags, metal sheets, empty chemical drums and cans etc. This waste should be segregated at source.

The non-hazardous waste would mainly consist of:

- Packaging materials, plastic wrappers etc.
- The type of non-hazardous waste will be transported to specialized facilities/waste contractor for recycling.

Mitigation Measures

- Waste generation will be minimized by adopting waste management strategy of reduce, reuses and recycle.
- A waste management plan will be prepared, implemented and monitored for the safe collection, storage and disposal of solid waste.
- Records of all waste generated will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register.
- Training will be provided to personnel for identification, segregation, and management of waste.
- All inert and non-hazardous wastes will be disposed to the existing tipping sites within or outside of the city limits.
- Waste storage areas should be located within the facility and sized to the quantities of waste generated.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from waste is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

Waste management inspections will be undertaken on a regular basis of on-site waste management and of waste disposal contractors to ensure that the waste management procedures are being followed.

7.4.7 Disturbance to Wildlife

As the proposed project site is present in an already urban developed area with minimal presence of wild life, therefore no significant impacts are envisaged on the wildlife during the construction and operational phase.

7.4.8 Socio-economic Impacts

a. Employment and Business

The proposed development will create employment during its construction and operational phase. During construction of proposed project, about 50 to 100 people are expected to be employed. The

proposed development will create employment opportunities for some 20 professionals and other supporting staff.

Most of the workforce will consist of local people. The generation of employment is likely to be another major beneficial impact arising from the proposed project during both construction.

b. Cultural Resources

There are no protected or otherwise cultural or archaeological sites within the premises of the proposed project site and hence no impact of the proposed project will occur on cultural or archaeological resources.

Mitigation Measures

- Designated parking areas will be provided for different type of project vehicles within and around are project site;
- Employment preference will be given to the locals;
- Local contractors will be given preference for hiring equipment and machinery during construction/ operation;
- Ensure maximum quantity of water to be treated in order to lessen its burden on the existing sewerage system;
- Locals, surrounding businesses, city government are kept on the same page during all stages of the development of the project;
- A complaint register will be maintained on site during construction and operation to record complaints of the nearby residents.
- It must be ensured that there is proper arrangement of reaching upto the top level in case of fire and extinguishing it.

7.4.9 Health and Safety

Potential Issues

The construction Phase and operational phase expected the major or minor incident in the depot premises. In addition for the operational phase fire hazard, dispersion of volatile substance in ambient environment as well.

Criteria for Determining Significance

A significant impact will be interpreted if the procedure and training is not given to employee properly; which may affect the Safety of employees. Prior to any site works, the proponent and contractor will develop a construction and operation management and waste management plan.

Such plans will be reviewed and approved by the proponent, and their implementation will be monitored by third party consultants and relevant authorities.

Impact Analysis

During construction activities the worker safety affected when the heavy machineries work on the project site. Employee's health issues related to suffocation, headache, irritation & respiratory disorders due the contamination of ambient environment. The contractor will ensure that activities at the site will not cause damage to lives and properties by implementing the following measures to ensure the health and safety of workers and the public.

Mitigation Measures

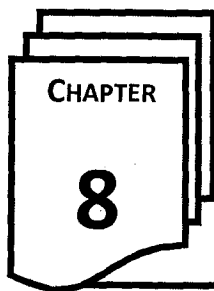
- Only skilled workers will be allowed to work during construction and operation activities.
- Activity areas will be fenced to avoid accidents and will be properly drained to avoid ponding of water that could harbor mosquitoes and other disease vectors,
- A proper fire safety system should be installed.
- Basic medical facilities and appropriate safety gear will be provided to workers.

Residual Impacts

Proper implementation of the mitigation measures will ensure that the residual impact from any accident to risk is minimal. Monitoring and inspection will be undertaken to ensure compliance and minimize any residual impact.

Monitoring Requirements

Safety inspections will be undertaken on a regular basis of on-site. Ensure the health & safety procedure. Fire precaution and extinguisher are up to date and randomly monitor, Safety guideline & procedures are being followed by the employee to save work practice.



ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

8.1 GENERAL OUTLINE AND SCOPE

The potential environmental impacts during the construction and operation phase proposed project on various environmental components of project surrounding such as social, biological and physical environment were predicted in the course of this IEE study. This IEE has also identified mitigation measures to minimize the environmental impacts of the proposed project, keeping these effects within acceptable limits.

The Environmental Management and Monitoring Plan (EMMP) has been designed to address how the proposed measures will be implemented. It defines the responsibilities of the project developer and contractor; develops a system of checks and balances; proposes actions that are to be taken by each role player; and lays down the required documentation, communication, and monitoring procedures.

8.2 PURPOSE AND OBJECTIVES

The purpose of this EMMP is not only to address the expected environmental impacts of the proposed project, but also to enhance project benefits and to introduce standards of good practice to be adopted for the proposed project.

The primary objectives of the EMMP are to:

- ❖ Facilitate the implementation of the mitigation measures that are identified in this IEE;
- ❖ Define the responsibilities of the project proponent and contractor and to provide a means for effective communication of environmental issues between them;
- ❖ Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures.
- ❖ An integrated Environment Management System play important role in sustainable industrial development if their Environment Management and Monitoring Plan is more effective and economically beneficial covering all activities of the industry and give proper implementable guidelines.

8.3 APPROACH

An integrated Environment Management System play important role in sustainable industrial development if their Environment Management Plan is more effective and economically beneficial covering all activities of the industry and give proper implementable guidelines. The EMMP prepared

specifically for the activities of the proposed project for construction and operation which has been presented in **Exhibit 8.1.**

Exhibit 8.1: Environmental Management Plan

Construction Phase			
Topography and Land Use Pattern	<ul style="list-style-type: none"> - Accidental spillage of oils and other lubricants or chemicals and leachate discharge from concrete mixing may impact the soil. 	<ul style="list-style-type: none"> - Proper site leveling will be ensured and will be restricted to the designated boundaries - Ensure that excavation and other earth works will be limited to proposed construction area; no extra area will be excavated or degraded. - A construction activity must be planned to minimize the disturbance to soil. - Concrete mixing or other liquid activities must be done on impermeable floor to prevent the contamination to soil and ground water - Regular inspections will be carried out to detect leakages in construction vehicles, equipment. - Ensure that lubricants and oils will be stored properly, having impermeable floors to reduce the probability of leaching of these lubricants into the soil. 	Contractor
Site Aesthetics	<ul style="list-style-type: none"> - Scattered construction material and residue may affect the site aesthetics. 	<ul style="list-style-type: none"> - Construction waste and residue will be stored at a designated area till its final disposal. Residual waste from construction will not be allowed to be disposed at open land and outside the storage area. - Proper housekeeping is to be ensured during project activities. 	Contractor/PSPL

		<ul style="list-style-type: none"> - The proponent will maintain an inventory of waste produced and disposal. - A designated area should be allocated for storage of construction material, residue and waste with separate storage areas. 	
Biological Environment	<ul style="list-style-type: none"> - Cutting of trees may result in ; - Ecological disturbance - Loss of habitats for birds 	<ul style="list-style-type: none"> - Ensure that no extra trees are cut or cleared during construction or mobilization of machineries. - Green belt should be provided and maintained - Re-plantation of trees is recommended by ratio of 1:5 for young trees and 1:10 for mature trees. - 	Contractor/PSPL
Air Quality	<ul style="list-style-type: none"> - Elevated levels of air pollution may result in following impacts: - Respiratory diseases and other health impacts. 	<ul style="list-style-type: none"> - Water spray will be used to control dust generation caused by earth disturbance activities and materials used during construction works, as well as the transit of heavy equipment - All the dusty material should be sprayed with water prior to loading unloading and transfer to control. - Ensure the timely maintenance and Use of standard construction equipment and vehicles; - Scheduled maintenance of equipment and vehicles including engine tuning in order to reduce the probability of other emissions. - The accumulation of loose material in areas susceptible to strong wind currents for long periods of time will not be allowed - Aplan must be devised to make daily inspections to assure the implementation of preventive measures to control 	Contractor/PSPL

		<p>fugitive dust. Compliance with these measures will be confirmed at end of each work week.</p> <ul style="list-style-type: none"> - The vehicle speeds on graded roads will be limited in order to minimize dust emissions. - Cordon of the construction sites to reduce the probability of fugitive emissions. 	
Noise Levels	<ul style="list-style-type: none"> - Elevated levels of noise may result in following impacts: - Headaches, - Hearing loss in severe conditions, Anxiety, - Accumulation of stress hormones and hypertension. 	<ul style="list-style-type: none"> - Use noise-abating devices wherever needed and practicable. - Construction equipment/machineries will be provided with suitable noise dampening systems to minimize noise at source; - The construction activities will be scheduled / planned in such a way to compliance with SEPA guideline 85 dB during daytime and 75 dB during night time. - Ensure that workers involved in construction activities provided with appropriate PPEs in order to reduce exposure of noise 	Contractor/PSPL
Water Sourcing and Quality	<ul style="list-style-type: none"> - The leakages, spillages and improper handling of oil, lubricants and other liquid waste may impact the underground water. 	<ul style="list-style-type: none"> - A complete record of water consumption during construction will be maintained; - Water conservation programme will be initiated to prevent wastage of water; - The water supply lines will be checked and repaired for leaks in order to reduce wastage of water; - Ensure that water efficient sanitary fittings are used throughout the development. 	Contractor/PSPL

Traffic and Transport	<ul style="list-style-type: none"> - The impact may arise due to increased load on existing roads networks Chances of accident exist in case of mismanagement. 	<ul style="list-style-type: none"> - Proper traffic system should be devised according to the number of vehicle and its movement in site to reduce the probability of traffic congestion - Proper parking area must be allocated for parking of vehicles. - Adequate warning signs in both directions will be provided at the approaches to road crossings 	Contractor/PSPL
Health & Safety	<ul style="list-style-type: none"> - Untrained workers may cause harm to themselves as well as others and lead to accidents - Improper Construction activities may include many risks and hazards that may lead to severe injuries 	<ul style="list-style-type: none"> - Basic medical facilities, first aid facilities and appropriate safety gear will be provided to workers - Emergency response training should be given to employees and evacuation drills should be scheduled and conducted - Emergency response plan emergency evacuation plan, Emergency fire drill and firefighting plan must be developed - Unauthorized personnel will not be allowed to access the proposed project site without permission and safety permits. - Workers should be facilitated by providing appropriate work specific PPE's; - Use of signage must be implemented. - Detailed risk assessment will be carried out. 	Contractor/PSPL
Solid Waste Disposal	<ul style="list-style-type: none"> - Poor practice solid waste management may result in leachates formation which may contaminate ground 	<ul style="list-style-type: none"> - Grey water and residue from construction activity should be reused i.e. site levelling. - Hazardous and chemicals must be disposed off by SEPA certified contractor 	Contractor/PSPL

	<p>water, produce nuisance & adverse aesthetic view</p> <ul style="list-style-type: none"> - Environmental pollution and health hazard due to disease causing vector 	<ul style="list-style-type: none"> - Separate bins will be placed for different type of wastes. - Recyclable material will be separated at source. The recyclable waste will be sold to waste contractors for recycling; - No waste will be dumped at any location outside the proposed site boundary; - All hazardous waste such as paint will be separated from other wastes. - Surplus construction materials including partially filled chemical and paint containers will be returned to suppliers. - Record of all wastes generated during the construction period will be maintained. 	
Air Quality	-	-	
Noise Levels	<ul style="list-style-type: none"> - Elevated levels of noise may result in following impacts - Headaches - Hearing loss in severe conditions, Anxiety, - Accumulation of stress hormones and hypertension. 	<ul style="list-style-type: none"> - Use noise-abating devices wherever needed and practicable. - Ensure that workers involved in operation of metal recycling process and machinery works are provided with appropriate PPEs in order to reduce exposure of noise. - Operation of multiple high noise equipment will be avoided to the extent feasible to prevent high noise activities during night times. 	PSPL
Water Quality	<ul style="list-style-type: none"> - Wastage and misuse of water may impact the water availability. 	<ul style="list-style-type: none"> - A complete record of water consumption during operational phase will be maintained; - Water conservation programme will be initiated to prevent wastage of water; 	PSPL

		<ul style="list-style-type: none"> - The water supply lines will be checked and repaired for leaks in order to reduce wastage of water; - Ensure that water efficient sanitary fittings are used throughout the development e.g. low flush toilets, efficient cleaning showers etc. 	
Health & Safety	<ul style="list-style-type: none"> - Improper protocol for health and safety may cause serious injuries and incident - Health hazards due to the exposure of high noise level in the operational area 	<ul style="list-style-type: none"> - Detailed risk assessment will be carried out. - Provision of first aid facilities for workers at site for meeting the emergency needs of workers; - Emergency evacuation plan emergency response plan emergency drill plan emergency firefighting plan must be implemented - Emergency response training should be given to employees and evacuation drills should be scheduled and conducted - Workers should be facilitated by providing appropriate PPE's; which is standard for metal recycling facility - OSHA standard of health and safety for metal recycling facility must be developed and implemented 	PSPL
Solid Waste Disposal	<ul style="list-style-type: none"> - Unattended and improper storage of solid waste can create unaesthetic and unhygienic condition of the site 	<ul style="list-style-type: none"> - Dumping of solid waste will be prohibited around the facilities. - Hazardous and chemicals must be disposed off by SEPA certified contractor. - Ensure the implementation of solid waste management plan for recyclable and non-recyclable waste, - Record of all wastes generated during the operational period will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking 	PSPL

		Register;	
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Exhibit 8.2: Environmental Monitoring Plan

Aspect	Impact	Mitigation	Monitoring Parameters	Location	Parameters	Frequency of Monitoring	Responsibility
Air	Chronic health affects Reduced visibility on roads	Sprinkling of water Tuning of construction vehicles & machines Dust masks for labor	Particulate Matter CO SOx NOx	generator and vehicles	Exhaust emission Dust Ambient air quality	Monthly for emissions and daily for dust	PSPL Contractor
Noise	Stress Hypertension Hearing loss Headache	Avoid working at night Schedule the work plan to reduce the elevated noise level as per SEPA guideline i.e.80 dB during day time &65 dB during night time. PPEs	Noise level	7.5m away from source	Noise Level Meter	Continuous	Contractor PSPL

Land and soil	Soil erosion/ degradation	Water sprinkling, stone pitching, reusing native excavated soil	Surface topography	Project site	Visual assessment Photographic evidences	From beginning till completion of project	Contractor PSPL
Vegetation	No cutting of trees is involved	Avoid unnecessary cutting of trees In case of cutting of trees, one plant should be replaced by 6 plants	No of trees cleared or cut Ensure re- plantation by 1:10 for mature plant & 1:5 for immature plant	Project vicinity and access route	Visual assessment Photographic evidences	From beginning till operational phase	PSPL
Water	Wastage and misuse of water Contamination of water Leachates	Avoid un necessary use of water Prevent leakages Treatment of Waste Water	Water supply and use	Project site	Visual assessment Record log of water usage	From beginning till the end of project	PSPL Contractor
Social Environment	Difference of opinion between contractor laborers and permanent employees	Specify time scale for construction activities Trainings of all personnel including contractor, laborers and permanent	Regular training sessions and tool box meetings	Project site	Review of training schedule	Daily	PSPL

		employees involved in the project Maintain the complaint register and take actions of serious concern of stakeholder					
Roads and networks	Traffic congestion	Signs & symbols are being followed Movement of vehicles is under safe construction practices	Signs and detours are being followed	Project Site	Visual Observations	Weekly	Contractor
Health and safety	Lack of awareness to visitors about safety may lead to accidents Incompetent and untrained workers might cause harm to themselves and others Construction works may include many	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work It is recommended to develop and implement the plan of health and safety, emergency	Safety precautions Use of PPEs	On all project sites	Tool box talk Risk assessment Record of PPEs, incidents, accidents and hazards	Daily	Contractor PSPL

	risks and hazards that may lead to injuries or even death	evacuation and fire drills should be performed. Appropriate PPEs must be provided					
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