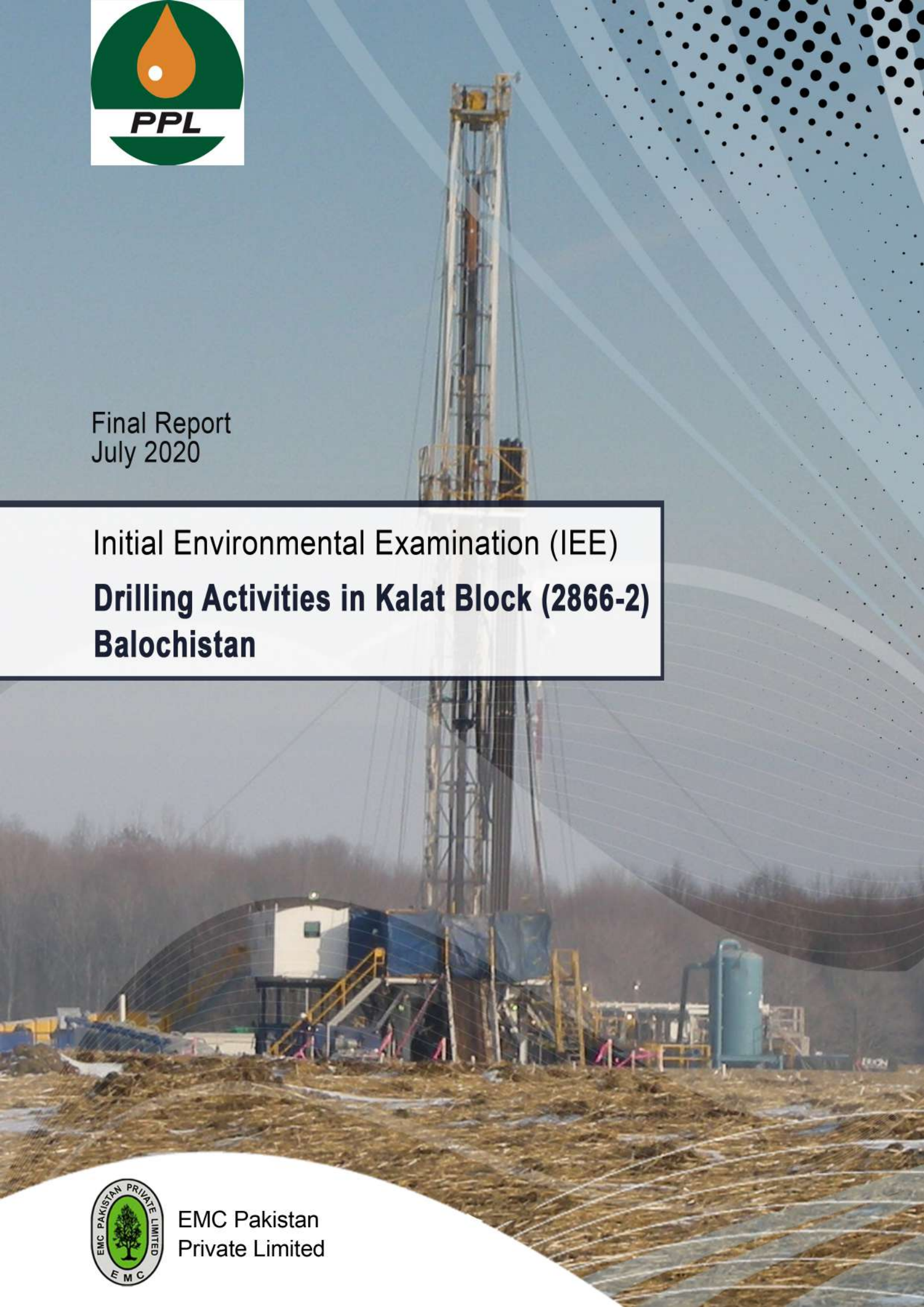

Final Report
July 2020

Initial Environmental Examination (IEE)

Drilling Activities in Kalat Block (2866-2) Balochistan

EMC Pakistan
Private Limited

Initial Environmental Examination (IEE)

Drilling Activities in Kalat Block 2866-2, Balochistan

Final Report

July, 2020

Ref. No. IEE/02/05/20

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ACRONYMS

IEE	Initial Environmental Examination
CC	Construction Contractor
HSE	Health Safety and Environment
COD	Chemical Oxygen Demand
BOD	Biochemical Oxygen Demand
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
GOP	Government of Pakistan
IFC	International Financial Corporation
IUCN	International Union for Conservation of Nature
LAA	Land Acquisition Act
NCS	National Conservation Strategy
NEAP	National Environmental Action Plan
NEQS	National Environmental Quality Standards
PPL	Pakistan Petroleum Limited
PLGO	Province Local Government Ordinance
E & P	Exploration and production
UNESCO	United Nations Educational Scientific& Cultural Organization
WHO	World Health Organization

EXECUTIVE SUMMARY

This document presents the findings of an Initial Environmental Examination (IEE) carried out by EMC Pakistan (Pvt.) Limited for the project "Drilling Activities in Kalat Block (2866-2), Balochistan" proposed by Pakistan Petroleum Limited (PPL) with an objective to explore the hydrocarbon reservoirs underlying the area. The proposed Wells are located in the mid of Kalat Block in Kalat district of Balochistan province.

Pakistan Petroleum Limited (PPL) is pioneer of the natural gas industry in the country, has been a frontline player in the energy sector since the mid-1950s. As a major supplier of natural gas, PPL today contributes over 20 percent of the country's total natural gas supplies besides producing crude oil, Natural Gas Liquid and Liquefied Petroleum Gas.

PPL plans to drill Wells in the middle of Kalat Block (Kalat Block has area of 1733 sq. km) which was granted by the Government of Pakistan for the extraction of oil and gas, located in District Kalat and Khuzdar, in non-protected and uninhibited area.

The main objectives of the exploratory drilling are as follows;

- To drill and evaluate hydrocarbons prospects safely without putting significant impact on the environment.
- To plan for the future production of oil and gas from the area.

Table ES-1: Details of the Exploratory Drilling Well in Kalat Block (2866-2)

Well Name	Latitude	Longitude
Kalat X-3	28°36'6.86"N,	66°36'28.20"E
Kalat X-4	28°37'57.62"N	66°37'10.57"E

Initial Environmental Examination (IEE) of the project has been carried out in compliance with the mandatory requirement of Section 15(1) of Balochistan Environmental Protection Act (BEPA), 2012 which requires that:

"No proponent of a project shall commence construction or operation unless he has filed with the Agency an initial environmental examination or environmental impact assessment, and has obtained from the Agency approval in respect thereof."

Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000, accordingly categorizes the proposed project in Schedule 1, requiring an Initial Environmental Examination.

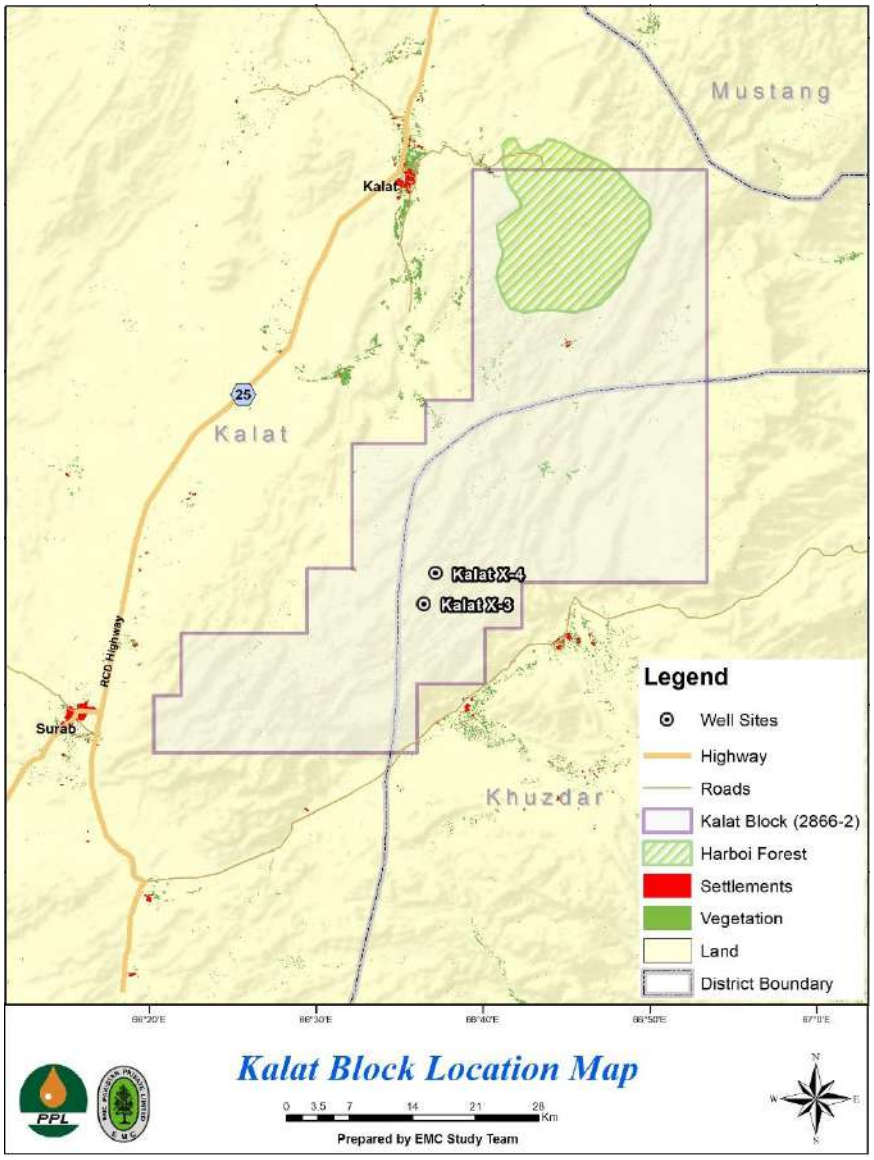

Figure ES-1: Location of Wells Kalat X-3, X-4 and Kalat Block (2866-2)

The schedule of drilling activities, from civil works to plugging and abandonment is expected to take about 12 to 13 months. The tentative duration of key activities is provided below:

Table ES-2: Expected Schedule of Drilling Activities	
Activities	Duration
Mobilization	15 days
Civil works	4-5 months
Drilling	4-5 months
Testing and demobilization	1-2 months

The potential environmental and socioeconomic impacts related to the proposed project have been identified through literature review, scrutinizing baseline data (both primary and secondary), professional opinions, experience, understanding of the proposed project activities, field observations and site surveys. The risks then identified have been addressed by recommendations of various mitigation measures to

reduce the severity of each impact. Assessment of the identified impacts was validated using the information obtained through site surveys. The experts engaged for the IEE study visited the project area to gather information on the environmental and social characteristics of the project area. The proponent shall oversee the entire activities with an objective to ensure environmental protection. The mitigation matrix for the drilling activities has been included in the section 5 of this report.

The EMP has been prepared in accordance to national and international environmental management guidelines that will be used as a contract document for the contractor(s) and their personnel during the project activities. Several aspects have been identified in this EMP to prevent or mitigate that environmental impact of proposed Drilling Activities of Well Kalat X-3 and X-4 in Kalat Block (2866-2).

The IEE concludes that the proposed activities will not lead to significant adverse environmental impacts and careful implementation of the EMP will ensure that potential impacts are managed and minimized and the project proponents meet all statutory requirements.

Table ES 2: Environmental Impacts & Characterization Matrix							
Landscape & Soil Erosion							
• Construction of proposed well site location, • Camp siting • Construction of access tracks.	Direct	Medium-term; depend on the availability of hydrocarbon reserves.	Local	Reversible	Possible	Medium	Low medium
Noise							
• Transportation of heavy machinery, materials, equipment & personnel. • Drilling operations.	Direct	Short to medium term	Local	Reversible	Possible	Minor	Low medium
Dust Emission							
• Dirt tracks by project related vehicles. • Earthworks and construction for campsite. • Combustion products (NOx, SO_2, PM, CO and VOC) from diesel generators used in the camps to generate electricity.	Direct	Medium term	Local	Reversible	Possible	Moderate	Low medium
Air Emissions							
• Exhaust emissions produced by generators. • Exhaust fumes from vehicles and construction machinery.	Direct	Short term	Local	Reversible	Low (unlikely) as mitigation measures will ensure that air pollution remains within acceptable limits.	Minor	Low

Table ES 2: Environmental Impacts & Characterization Matrix							
Water Abstraction							
• Water required for drilling operation and other project activities.	Direct	Medium- term; depend on the rainfall pattern and recharge regime of the deep aquifer.	Local	Reversible	Possible	Minor	Low Medium
Soil and Water Contamination							
• Domestic waste (sanitary and kitchen discharge). • Oil and grease from vehicles and machinery. • Sediments from altered land surfaces (campsite). • Stored fuel, oil and other chemicals.	Direct	Medium term (after implementation of mitigation measures)	Local	Reversible	Possible	Minor	Low Medium
Impacts on Wildlife							
• Improvement and construction of the access road. • Removal of vegetation only where required.	Direct	Short term to medium term	Local	Possible	Possible	Minor	Low Medium

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1.0 INTRODUCTION

Name of project: Initial Environmental Examination of Drilling activities in Kalat Block (2866-2).

Location of the project: District Kalat, Balochistan

Project proponent	IEE Consultant
Pakistan Petroleum Limited 4th floor, PIDC House, Dr. Zia Uddin Road, Phone:(+) 9221-111 568 568 Fax: (+) 92- 21-35680005 Email: info@ppl.com.pk	**EMC Pakistan Pvt Ltd** Office # 503, Anum Estate Building, Main Shahra-e-Faisal, Phone: +92-21-34311466, 34321532 Fax: +92-21-34311467 Email: mail@emc.com.pk

1.1 General

This document presents the findings of an Initial Environmental Examination (IEE) carried out by EMC Pakistan (Pvt.) Limited for the project "Drilling Activities in Kalat Block (2866-2) Balochistan", proposed by Pakistan Petroleum Limited (PPL). The proposed project is the drilling of exploratory Wells X-3 and X-4. The block lies in district Kalat and district Khuzdar and has area of approximately 1733 sq. km. However, wells are located in the southern portion of the block which is Kalat District, Balochistan. Therefore, this IEE includes environmental and social baseline of Kalat District and Balochistan Province.

1.2 Need of Environmental Assessment

The Initial Environmental Examination (IEE) has been prepared in compliance with the requirement under section 15 of Balochistan Environmental Protection Act, 2012 and BEPA IEE/EIA Regulations 2012 for scheduled development projects. Compliance with the Provisions of BEPA Act 2012, Section 15 requires that: *"No proponent of a project shall commence construction or operation unless he has filed with the Agency an initial environmental examination or environmental impact assessment and has obtained from Agency approval in respect thereof."*

This Initial Environmental Examination (IEE) report presents the evaluation of environmental impacts of the drilling activities in Kalat Block 2866-2, Balochistan.

1.3 Pakistan Petroleum Limited-The Proponent

The pioneer of the natural gas industry in the country, Pakistan Petroleum Limited (PPL) has been a frontline player in the energy sector since the mid-1950s. As a major supplier of natural gas, PPL today contributes over 20 percent of the country's total natural gas supplies besides producing crude oil, Natural Gas Liquid and Liquefied Petroleum Gas.

The company's history can be traced back to the establishment of a public limited company in June 1950, with major shareholding by Burmah Oil Company (BOC) of the United

Kingdom for exploration, prospecting, development and production of oil and natural gas resources. In September 1997, BOC disinvested from the Exploration and Production (E&P) sector worldwide and sold its equity in PPL to the Government of Pakistan (GOP). Subsequently, the government reduced its holding through an initial public offer in June 2004, which was further decreased with the initiation of the Benazir Employees Stock Option Scheme (BESOS) in August 2009 when PPL employees were allotted 12 percent shares from the government's equity. More recently, GoP further disinvested its 5 percent shares, around 3.55 percent of the total paid-up capital, in PPL through Secondary Public Offering in 2014. Currently, the company's shareholding is divided between the government, which owns about 68 percent, PPL Employees Empowerment Trust that has approximately 7 percent — being shares transferred to employees under BESOS — and private investors, who hold nearly 25 percent.

PPL has acquired 100 percent shareholding of MND E&P Limited, a company incorporated in England and Wales. The name of the subsidiary has been changed to PPL Europe E&P Limited.

Vision

To maintain Pakistan Petroleum Limited's position as the premier producer of hydrocarbons in the country by exploiting conventional and unconventional oil and gas resources, resulting in value addition to shareholders' investment and the nation as a whole

Mission

To sustain long term growth by pursuing an aggressive hydrocarbons exploration and production optimization program in the most efficient manner through a team of professionals deploying latest technology, maintaining the highest standards of quality, health, safety & environment protection and addressing community development needs.

Corporate Social Responsibility

Pakistan Petroleum Limited (PPL)'s Corporate Social Responsibility (CSR) program dates back to the start of PPL's commercial operations in Sui in the 1950s when the company established a school for children of workers and local communities. Since then, CSR has been the centerpiece of PPL's corporate ethos.

In 2001, the PPL Welfare Trust (PPLWT) was founded to provide geographic and thematic diversity to the company's CSR program, which includes education, health, infrastructure development, socio-economic uplift of disadvantaged communities, particularly those living in and around its operating areas, and post-disaster rehabilitation.

Need analysis, scoping, planning and execution of CSR projects is carried out through strategic local partnerships. To ensure swift delivery, maximum on-ground impact and sustainability of its social investments, all interventions occur after due consultation and mutual agreement with stakeholders, including community representatives, local governments and non-governmental organizations.

Sui Model School	PPL Public Welfare Hospital
SOS Children Village	Relief Packages for flood affectees

As one of the leading corporate providers of social development and welfare services in some of the most remote swathes of the country, PPL has received Pakistan Corporate Philanthropy Award for 11 consecutive years from 2004 to 2014.

Quality, Health, Safety and Environment

Pakistan Petroleum Limited (PPL) strives to maintain international standards and best industry practices to ensure consistency in provision of safe energy from indigenous sources. The company recognizes that operational safety and health for staff and contractors, maintaining quality of processes and outputs and constricting the ecological footprint of operations promotes excellence and corporate responsibility.

Quality, Health, Safety and Environment (QHSE) function was established to provide integrated support for assurance and control of technical and administrative operations, works performance and asset integrity besides, inculcating safety awareness and adopting best operational practices in strict compliance with statutory Health, Safety and Environment standards.

For consistency in implementation of standard QHSE practices, staff capacity building sessions on emergency response, asset integrity and process safety are regularly held. Moreover, safety guidelines are provided to staff, contractors and guests visiting fields and office locations. QHSE practices and tools are integrated into the management and operational processes, including SAP audit management and quality modules, to obtain tangible benefits through efficient monitoring. On the conservation front, reporting to relevant provincial environmental protection agencies or EPAs is carried out through the

Self-Monitoring and Reporting Tool for compliance with the National Environmental Quality Standards. Initial Environment Examination and Environment Impact Assessment studies are mandatory prior to initiating new projects/ development work.

As a result, 13 fields and Departments are certified for ISO 14001 Environmental Management System (EMS) and ISO 9001 Quality Management System (QMS) and 14 for OHSAS 18001 Occupational Health and Safety Assessment Series (OHSAS).

In order to sustain and update compliances, all certified facilities and departments undergo regular internal and external surveillance audits, following which corrective measures are implemented for continual improvement in the system.

Employees from various technical departments are qualified lead auditors for ISO 9001 QMS, ISO 14001 EMS and OHSAS 18001 to assist in executing audits.

In recognition of its efforts to ensure operational health, safety and environmental conservation, PPL has received the Employers' Federation of Pakistan's prestigious Occupational Safety, Health and Environment Best Practices Awards in 2012 and 2014.

1.4 Project Location

The proposed Wells Kalat X-3 and Kalat X-4 are located in the south of Kalat Block (2866-2) in district Kalat, Balochistan. Location coordinates of Wells are given below.

Table 1.1: Coordinates of Well locations,

Well Name	Latitude	Longitude
Kalat X-3	28°36'6.86"N,	66°36'28.20"E
Kalat X-4	28°37'57.62"N	66°37'10.57"E

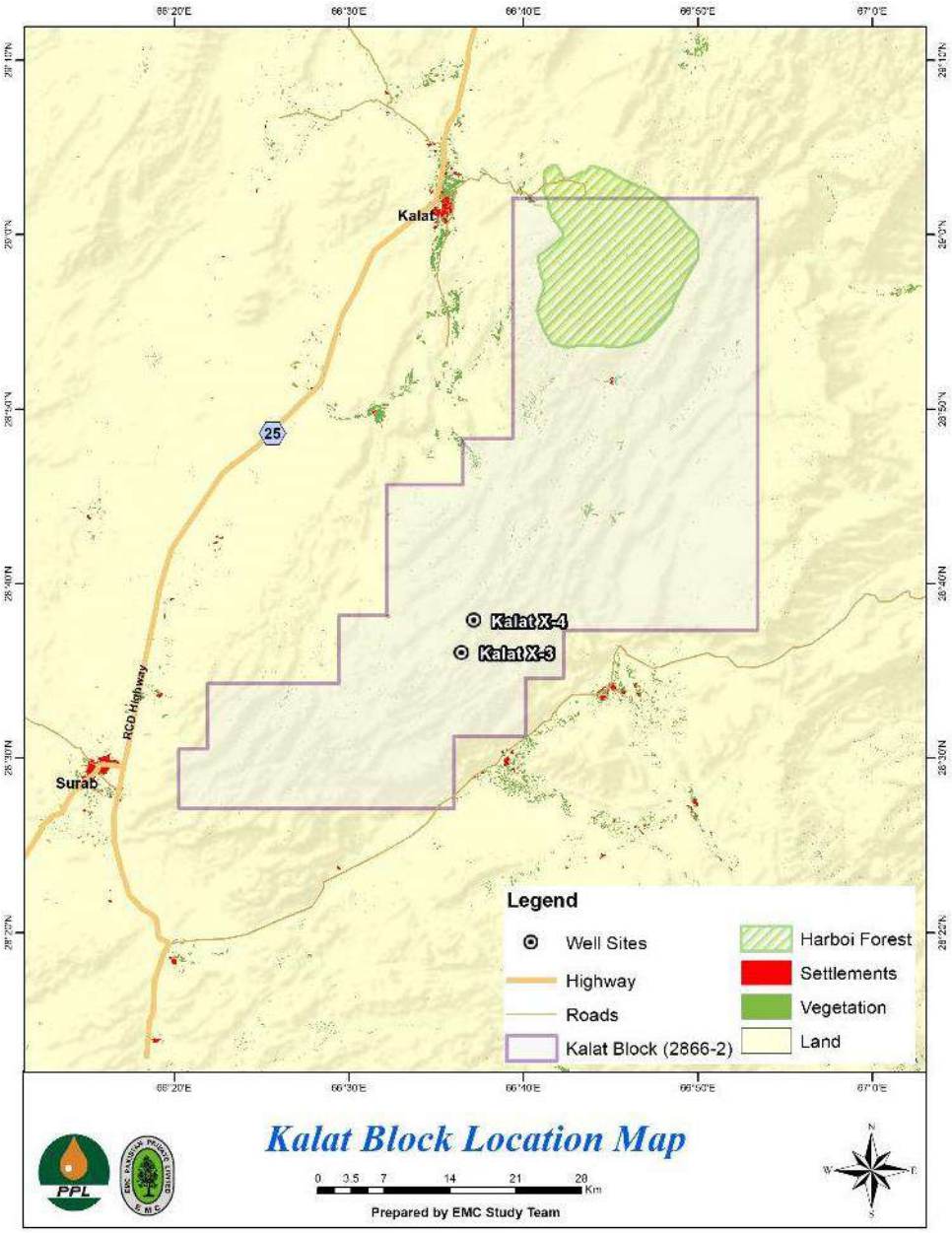

Fig. 1.1: Location map of Well X-3, X-4 and Kalat Block (2866-2)

1.5 Scope of IEE Study

Drilling activities can have negative impacts on the environment. The potential impacts occur mainly on the area in which such activities are being undertaken and includes crop damage, disturbance to local communities and wildlife, destruction of wildlife habitat, soil erosion, and water pollution etc. However, through the identification of impacts, and the development and implementation of mitigation measures, such potential environmental impacts can be avoided or reduced, making the project social and environmental friendly and economically feasible.

This IEE study aims to present the environmental report of the project "Drilling Activities in Kalat Block (2866-2)" to assess the impacts of its siting on the existing physical,

ecological and socioeconomic environment. The main rationale of the IEE study is to make sure that:

- Any major undesirable impacts on the environment (physical, ecological and socioeconomic) during drilling are identified;
- Negative impacts, if any are correctly addressed and satisfactory mitigation measures are suggested for inclusion in the proposed activities of the project;
- Environmental Management Plan (EMP) is provided for sustainable development and operation of the project;
- To submit the assessment report to Balochistan EPA;
- To acquire environmental approval from Balochistan Environmental Protection Agency.

This IEE report appropriately recognize the environmental aspects and screens the potential impacts to make sure that the effects of various activities on the proposed site have been carefully assessed and mitigation measures are properly planned & implemented to keep environmental impacts under acceptable limits.

1.6 Categorization of the project

On the basis of the categorization given in Schedules I and II of the Balochistan Environmental Protection Agency (Review of IEE and EIA) Regulations, 2012, the proposed project falls in Schedule I requiring an IEE as the project is categorized as:

B. Energy:

5. Oil and gas extraction projects including exploration, production, gathering systems, separation and storage.

1.7 Methodology for Initial Environmental Examination study

Various steps were undertaken in order to conduct, prepare and present this IEE report. Brief details of those steps are given below while their description is documented in the subsequent sections of this report.

1.7.1 Understanding the Proposed Project

This step required collection of information from PPL for the proposed project and understanding the activities to identify potential impacts.

1.7.2 Review of Legislation and Guidelines

National legislation, international agreements, environmental guidelines and best industry practices were reviewed to set environmental standards that PPL will be required to conform/adhere during the project activities.

1.7.3 Secondary Data Collection

All available published and unpublished information pertaining to physical, biological and socio-economic micro & macro environment was obtained and reviewed. It included

previous environmental studies and baselines conducted for drilling and production activities in Balochistan.

1.7.4 Field Data Collection

This study is based on the findings of the visits by the team. Team members visited the location and its neighborhood to perform reconnaissance survey and to gather primary baseline data with reference to environmental (physical & biological) and social aspects. Discussions were also held with the members of the community residing in the area to collect area-specific primary information along with their views and concerns regarding the project and its activities.

1.7.5 Baseline Studies

The environmental profile of the project area was established through secondary data as well as primary data (field surveys). The information was collected and compiled on environmentally important areas (Surface and Groundwater Resources, Existing and Proposed Roads, Local Communities, Agriculture, Public Services, and Sites of Archeological or Cultural Importance).

1.7.6 Impact Identification and Assessment

Potential impacts which may arise from project related activities were identified. These include effects on physical, biological, socio-economic, archaeological and cultural environment. Impacts were identified and assessed on the basis of field data, secondary data, expert opinions and monitoring results of previous oil and gas exploration projects in Pakistan.

1.7.7 Recommendations to Mitigate Impacts

Keeping in view the baseline data collected and impacts identified; mitigation measures have been recommended to eliminate, minimize or compensate for the potential environmental and social impacts on the zone of influence of the project. Mitigation measures recommended here are based on past experience, best industrial practices, legislative requirements and professional judgments.

1.7.8 Framework of Environmental Management Plan (EMP)

Environmental management plan (EMP) was developed for effective implementation of the recommended mitigation measures. EMP includes controls to minimize the identified impacts, and monitoring program to monitor residual impacts, if any, during the operation. The EMP has laid down procedures to be followed during the drilling and production operation and has identified roles and responsibilities for all concerned personnel during the operation, including post project reporting.

1.7.9 Documentation, Review and Conclusion

Documentation, Review and Conclusion are the final steps to complete the Initial Environmental Examination (IEE) study and compiles all work done in shape of this report.

Report writing started just after the commencement of Initial Environmental Examination. At the end of the study, the entire report is reviewed and then the conclusions and recommendations are framed in the light of the findings.

1.8 Structure of the IEE Report

The IEE report has been structured on the standard format, prescribed by the Federal EPA. The Report has been presented in the following sections:

Section 1: Provides an introduction and overview of the Project and the IEE process;

Section 2: Describes the proposed project and its associated activities in detail;

Section 3: Gives an overview of national & international policies and legislations along with guidelines relevant to the project;

Section 4: Provides description of the microenvironment and macro environment of the Project area; explaining its physical & biological environment, as well as the socio-economic conditions;

Section 5: It includes screening of potential environmental and socioeconomic impacts arising from PPL Project and incorporates the mitigation measures been devised. General and Project specific guidelines are used to assess the potential environmental impacts at various phases of the Project;

Section 6: Presents a comprehensive Environmental Management Plan (EMP) and Monitoring Program for the project;

Section 7: Summarizes the report and presents its conclusions.

The main text of the report is supported by a series of Annexures which provide supplementary information including respective sections of prominent national laws and guidelines.

1.9 IEE Study Team

This IEE report has been prepared by the team of EMC Pakistan (Pvt.) Limited which comprises of the following members mentioned in Table 1.2.

Table 1.2: Members of- IEE Study Team of EMC Pakistan (Pvt.) Limited

Sr. #	Name of Experts	Position in IEE Study Team
1.	Mr. Syed Nadeem Arif	Project Manager
2.	Mr. Ahmed Zohair Siddiqui	Environmental Engineer, Team Leader
3.	Ms. Samita Nadeem	Senior Environmental Engineer
4.	Mr. Abdul Rauf Siddiqui	Environmental Scientist
5.	Mr. Syed. M. Omer Arif	Environmental Engineer
6.	Mr. Rameez ul Islam	AutoCAD Expert
7.	Syeda Aliya Hasan	GIS Expert

2.0 DESCRIPTION OF PROJECT

2.1 The Project

PPL plans to drill two exploratory Wells, Kalat X-3 and Kalat X-4, in the Kalat Block (2866-2) which has been granted to PPL by the Government of Pakistan for the purpose of oil and gas exploration. Kalat Block (2866-2) covers an area of approximately 1733 sq. km and falls in District Kalat and Khuzdar of Balochistan. The exploratory Wells Kalat X-3 and X-4 are located in the southern portion of the block in Kalat district in Balochistan. The coordinates of the Wells are 28°36'6.86"N, 66°36'28.20"E and 28°37'57.62"N 66°37'10.57"E respectively.

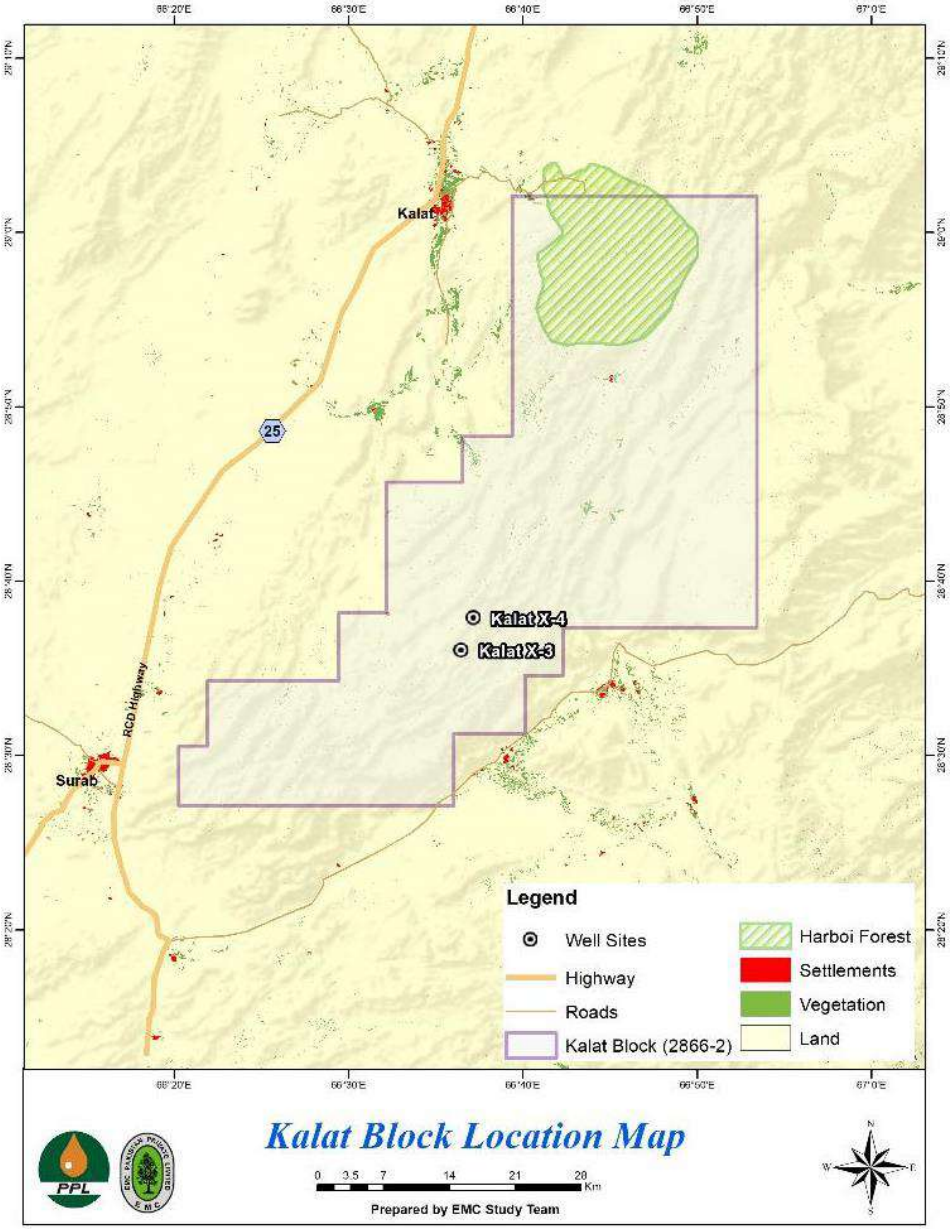

Figure 2.1: Location map of Wells Kalat X-3 & X-4 & Kalat Block

2.2 Scope of Work

The project involves activities associated with drilling of well for oil and gas exploration programs as described below;

- Land acquisition
- Construction of access road
- Development of well site and campsites
- Mobilization
- Drilling
- Well evaluation and Completion, restoration and rehabilitation
- Field Development

2.3 Drilling Operation

Based on the results of the seismic operation, one exploration well will be drilled. Activities for well will include construction of a well site, camp site, and an access track; drilling of the exploration well; possible well testing in case of a discovery; abandonment, completion or suspension of the well depending on the success or failure of the well and site restoration.

2.3.1 Schedule

The drilling operation of well, from civil works to plugging and abandonment is expected to take about 12 to 13 months. The tentative duration of key activities is provided below;

Table 2.1: Duration of Drilling phase activities

Activity	Duration
Mobilization	15 days
Drilling	4-5 months
Civil works	4-5 months
Testing and demobilization	1-2 month

2.3.2 Construction

In this phase of the operation a well site, rig camp and access track will be developed for the drilling of the exploration well. The construction contractor will develop its own camp for construction purposes. The camp will house a maximum of 40-50 people. The contractor will also hire local people for unskilled jobs. The construction works will take approximately 4-5 months. The power for the construction site will be acquired through a diesel generator of 50-80 KVA.

Well Site

The well site and rig camp site will cover an area of approximately 8-10 acres. Construction works to develop a well location will involve the following:

- Clearing, leveling and compaction;
- Construction of the drilling rig pad and cellar;
- Construction of septic tanks and soak pits;

- Construction of platform for fuel storage tank with sump and loading/ un-loading pads; and
- Installation of chain link fence around the well site

Rig Camp

The rig camp site will consist of portable cabins, kitchens, mess rooms, bathrooms, laundry area, etc. for which limited construction works including leveling, grading, filling and compaction will be required. Development of campsite includes, but not limited to the following;

- Leveling and compaction of area for the campsite;
- Provision of drainage works in and around the campsite;
- Laying and compaction of the gravel topping in the campsite;
- Construction of fuel storage tank with sump and loading/ un-loading pad;
- Provision of fence, access and emergency gates;
- Construction of septic tank and soak pits;
- Installation of security guard wooden cabins; and
- Installation of sewerage pipeline with manholes for the septic system;

Access track

Construction works to develop the access road includes, but not limited to the following;

- Cutting and filling;
- Leveling, grading and compaction of sub grade;
- Laying and gravel compaction;
- Construction of pipe culverts and Fjord crossing;
- Provision of earthen catch drains;
- Provision of pass points at every 1,000m; and
- Provision of milestones, road and safety signs.

An existing track will be used as much as possible to access the selected drilling location. Access tracks exists in the area, development of new tracks may be limited to 2-3 km. The access road will be upgraded / built to a standard that is suitable for movement of 40 ft. flatbed trucks. The road will be 5m wide and compacted with gravel.

Water required during construction will be obtained from either local wells, existing water wells installed by PPL in the block or new water well installed by PPL in the area of operation.

After completion of construction activities, all except for a few machineries, equipment and personnel required for maintenance of the access road will be demobilized form the area.

2.3.3 Rig Mobilization

Following the construction of the well site, camp site and access road, mobilization of the rig and related machinery and equipment will commence. Mobilization will involve the transportation of the following to designated drilling location;

- The drilling rig;
- Ancillary equipment such as power generators, mud pumps, mud tanks, shale shakers, cementing unit, drill pipe and collars;
- Porta-cabin style camp, complete with all catering, power generation, laundry and other facilities;
- Drilling and other necessary support personnel; and
- Drilling material such as casing and associated accessories, well heads, drill bits, drilling fluid chemicals, liner hanger equipment

The drilling rig will be transported to the site using 40 ft. long trailers. Depending on the type of rig, approximately 80 to 150 truckloads of equipment will be transported during mobilization. The rig will be assembled and erected over the well location.

2.3.4 Drilling

Drilling will be carried out using conventional equipment, techniques and practices for hydrocarbon exploration. A rotary drilling rig will be used in this operation the derrick will be mounted on a steel platform known as the rig floor. The rig floor will provide working area for the drilling operations and personnel. A hoisting drum called draw works will be mounted on the rig floor at the base of the derrick. A wire rope called the drilling line will pass from the draw works to the top of the derrick through a system of pulleys called the crown block and will be attached to a further system of pulleys known as the hook and block. The whole system of wire rope and pulleys will operate like a crane. A drill string made up of uniform lengths of hollow steel pipes will be suspended from the hooks. Suspended from the drill string will be the drill bit. The drill bit will drill through the formations by the combined effect of the weight of the drill collar and the rotary action provided to the bit by a rotary table mounted on the rig floor. Rotation of the drilling bit and string is achieved by means of powerful electric motors on the surface.

Based on the sections of the well, drill bits with diameter 32, 24, 17.5, 12.25, 8.5, and 6 inches are expected to be used. As drilling progresses in a given section of the well the length of the drill string will be increased by the addition of new lengths of pipes. Steel pipes known as casing will be lowered into the hole to line the sides of the well and prevent the hole from collapsing. At the end of drilling each section, these steel casings will be cemented into place by pumping cement into the space between the casing and the surrounding strata. The sections of the well will be drilled in this manner until the desired target depth is achieved.

A view of Well Casings	Drilling Bit

Fig. 2.2: Drilling equipment

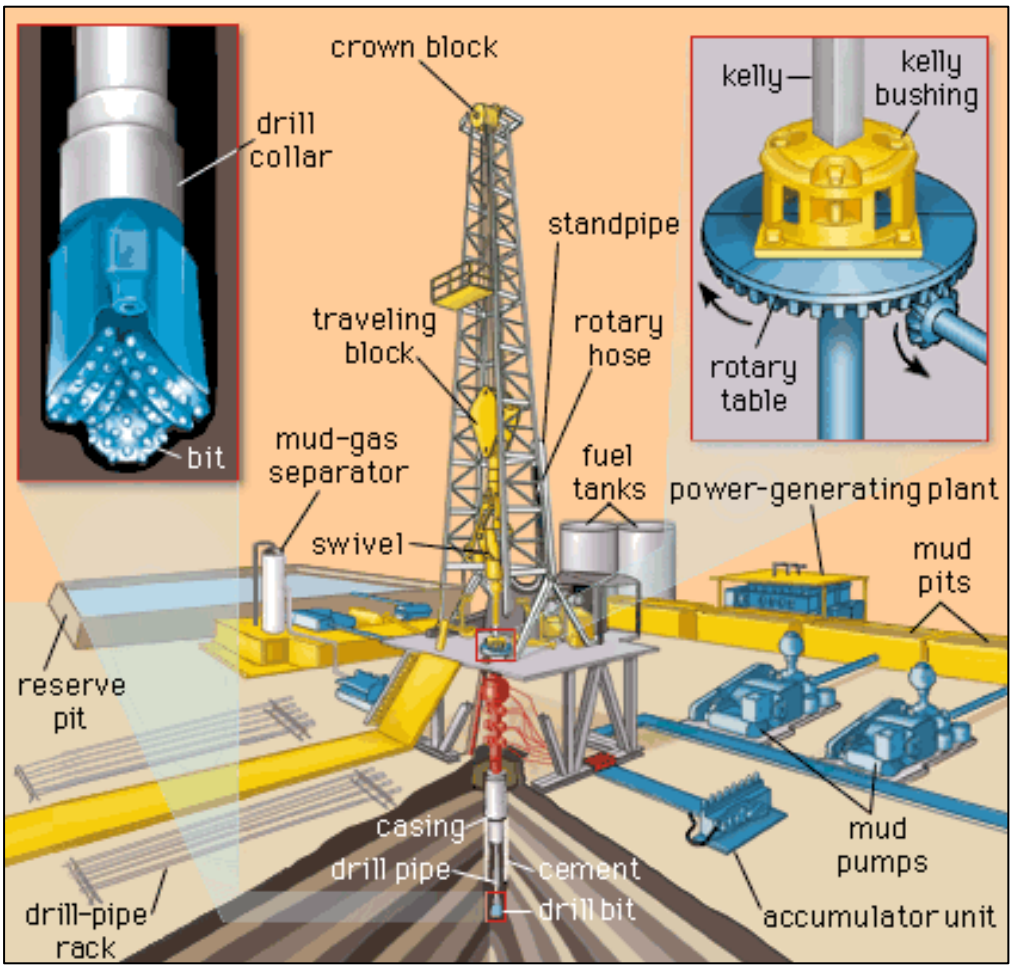

Fig. 2.3: Anatomy of a rotary drilling rig

2.3.5 Drilling Mud

A water based drilling mud will be used during the operation to serve the following functions:

- Flushing out drilled solids from the bottom of the hole and transfer to the surface;
- Lubrication and cooling of the drill bit and string;

- Deposition of an impermeable layer on the wall of the well-bore so as to seal the drilled formations; and
- Countering the natural formation pressures and preventing uncontrolled flow of fluid from the formations.

The drilling mud will consist of slurry of formation cuttings suspended in liquid phase. Certain additives such as bentonite, barite and salts will be used for initial mud formulation and subsequent changes as required during the operation. The exact constituents and concentrations will be finalized before the drilling operation. The quantity of drilling mud used and the cuttings generated will depend upon the well geology, depth of the well, and other operating factors. After completion of drilling the cutting remaining in the waste pit will be allowed to dry out. The cutting will be then encapsulated within the liner and the waste pit will be backfilled leaving a topsoil cover over the pit.

Table 2.2: Constituents of a Water Based Drilling Mud

S No.	Chemicals
1	Barite
2	Bentonite
3	Carboxy Methyl Cellulose
4	Mud Thinner/Conditioner
5	Resinated Lignite
6	Non-Weighted Spotting Fluid
7	Weighted Spotting Fluid
8	EP Lube
9	Drilling Detergent
10	Caustic Soda
11	Potassium Chloride
12	Soda Ash

Table 2.3: Special additives and their functions in Water Based Drilling Fluid

S. No	Discharge Category	Exploration
1	Sodium Bicarbonate	Eliminate excess calcium ions due to cement contamination
2	Sodium Chloride	Minimize borehole washout in salt zone
3	Groundnut Shells, mica of cellethane	Minimize loss of drilling mud to formation
4	Cellulose polymer or starch	Counter thick, sticky filter cake, decrease filter loss to formation
5	Aluminum Stearate	Minimizing foaming
6	Vegetable oil lubricant	Reduce torque and drag on drill string

7	Pill of oil-based mud spotting fluid	Counter differential pressure sticking of drilling strings. Pill is placed down hole opposite contact zone of free pipe.

2.3.6 Coring and Well Logging

In the potential reservoir section, cores of rock will be taken from the borehole and a number of well logs are performed. Cores and well logs will be used to confirm geology of the structures being bored through and assess the accuracy of the seismic survey data interpretation done before drilling. Coring and well logging will also help identify possible hydrocarbon.

2.3.7 Well Evaluation

After having drilled to the specified depth, a number of logs for hydrocarbon bearing strata will be taken to accurately measure the pressure and fluid content of the zone. The main objectives of the logs will be to determine the fluid composition (gas, oil, or water), whether or not it will flow, and its pressure regime.

If test results show that oil/gas has been encountered, it becomes necessary to conduct further tests to determine whether it is feasible to develop the well. Tests are conducted to determine the gas composition and the reservoir's permeability.

Once the temporary or permanent valves are in place, it is ensured that the mud column is more than adequate to counteract any formation pressures that could be released. After that, a mechanical plug is used to plug off the area of the formation being tested, and tubing is run through the plug. A Blow out Preventer (BOP) is kept in place throughout the test. Once these steps have been taken, gas is allowed to flow to the surface, and is passed through a 3-phase separator that segregates the fluid into water, gas and oil (if present) or condensate. Metering devices and valves are used to estimate the gas production rate, after which the gas and associated condensate are flared, and water discharged into the mud pit.

2.3.8 Well Completion

If data collected from coring, logging and well testing shows that the well can be used as a producing well then a completion string together with a few items of subsurface equipment (such as a down hole plug) to enable production from the well will be installed just above the producing formation. The mud in the well will be displaced by completion fluid, which typically consist of potassium chloride brine, containing small volumes of chemicals designed to protect the well. These chemicals will include a corrosion inhibitor, an oxygen scavenger, biocide, and a chemical for pH control. The final design of the completion equipment will depend on the sub-surface geology.

2.3.9 Well Control & Blow out Preventer

In addition to careful monitoring and control of the mud system and the installation of casing in each section of the well, a surface wellhead consisting of a series of Blow out Preventers (BOPs) will be installed at the top of the casing. The function of the BOP is to

prevent uncontrolled flow from the well by positively closing in the well bore as and when required. The BOP is made up of a series of hydraulically operated rams, and is designed to withstand pressures well in excess of those expected to be encountered.

Figure 2.4: Blow out Preventer

2.3.10 Staffing & Supplies

The drilling rig will be operated by approximately 40-50 persons on the rig at any time. The manpower will operate in two shifts with continuous on the rig. Local people will be given priority for unskilled jobs. During the drilling program, the supplies, with the exception of casing, will be transported to the rig in smaller trucks. Casing will be carried to the rig in 40 ft. flatbed trucks. General supplies transported will include camp supplies (food, etc.), fuels, oils and chemicals, and equipment maintenance parts. Project personnel will travel to and from the rig in smaller vehicles, mostly four-wheel drive pickups. Water for rig and camp operation will be transported to the site from the suitable source. A maximum of 150,000 liters of water will be required per day for this purpose. Water required during construction of well site and during drilling is provided in Table 2.4.

Table 2.4: Summary of water usage during various project activities

Parameter	Rate
Domestic water usage	Approximately 200 liters per capita per day
Construction of well site	80,000[a] liters per day
Drilling Operation	150,000[b] liters per day

Notes:
a: The values are for total consumption of water for domestic and construction purposes. Usually construction and domestic activities takes up to 80% and 10% respectively of the total water consumption with the remaining amount of water being used for sprinkling purposes.
b: The values are for total consumption of water for domestic and drilling purposes. Usually drilling and domestic activities takes up to 60%, and 40% respectively of the total water consumption.

2.3.11 Demobilization and Site Restoration

After completion of the drilling and testing operations, the rig will be dismantled and demobilized off the site. The wellhead will remain in situ, but all other equipment and materials including empty drums used and unused chemicals, fuels and lubricants will be removed from the well site by their respective suppliers. After well evaluation, a decision on whether to abandon or further develop the well will be taken. If it is decided that the

well is to be abandoned, the site will be restored, as far as possible, to its original condition. All the concrete will be broken up and removed, the fencing will be removed, and the area levelled. All the broken concrete may be taken outside of the project area for disposal, reused for backfilling of pits or provided to locals for re-use. All waste products, solid and liquid will be disposed of in accordance with the requirements of the IEE. All pits will be backfilled. Drill cuttings will be disposed of within the lined cuttings pit at the well site. Drilling mud and other liquids will be allowed to evaporate inside the lined pit after which the pits will be backfilled. The access roads may be left intact if local people desire to use them. If not, they too will be restored and the land returned to its original use.

2.4 Noise, Air Emissions, Effluents and Solid Waste Generation

This sections provides the details of noise, air emissions, effluents and solid waste generated during various phases of project activities.

2.4.1 Noise

Noise is likely to be generated by the following construction and drilling activities:

a. Construction Phase

- Operations of generator at the construction base camp
- Movement of vehicles
- Construction works along access tracks and well site and rig camp

b. Drilling Phase

- Vehicular traffic on the access road;
- The operation of drilling rig at the well site; and
- The operation of diesel generators and other equipment at the well site and the camp.

Measured at a distance of 15 m, vehicular traffic is expected to generate 60 to 70 dBA of noise, the rig between 70 and 98 dB(A), and the diesel generators up to 82 dB(A). Since the generators will operate throughout night, appropriate noise reduction measures (such as construction of a brick wall around the generators) will be implemented, if required.

2.4.2 Emissions

Emissions produced during the drilling phase will consist of the following:

- Dust emissions during construction – these will be controlled by proper water sprinkling and good construction management
- Dust emissions from vehicular traffic on the roads – these will be controlled by avoiding off road travel, observing speed limits and track maintenance;
- Emissions from vehicles and generators – these will be controlled by proper maintenance (exhaust emissions from generators at the construction base camp, well site and rig camp will generally meet the NEQS);

- Emissions from flares and H_2S release during testing and any abnormal drilling operations – the effects of these emissions will be controlled by maintaining a safe distance from communities and adhering to company's emergency response plan in case of H_2S release.

The emissions produced by the diesel generators are listed in Table 2.5.

Table 2.5: Typical Emissions from 920 KW and 436KW Diesel Generator*

Generator 75% Load	**Capacity**	
	920 KW	**436 KW**
Fuel consumption	192 liters /hour	97 liters /hour
Sulphur Dioxide (SO_2) emission	3,169 g/h	1,601 g/h
Carbon monoxide (CO) emissions	2,666 g/h	1,347 g/h
Nitrogen oxides (NOx) emissions	6,024 g/h	3,551 g/h
Particulate matter emissions	314 g/h	159 g/h
Exhaust flow rate	64 Nm^3/min	32 Nm^3/min
Exhaust stack temperatures	448 ºC	555 ºC

** Fuel consumption and exhaust temperature based upon data sheet of Caterpillar Diesel Generator Model CAT 3512. Emissions calculated based on the emissions factors given in AP42 (USEPA1996).*

2.4.3 Effluents and Solid Waste

All efforts will be made to minimize the waste generated while the project is in progress. The main types of waste that will be generated are:

- Drill cuttings and mud;
- Formation fluids;
- Fuels, oils, and chemicals;
- Garage waste;
- Sewage;
- Camp waste; and
- Medical waste.

2.5 Waste Management

The main concept for waste management will be that the environmental impacts associated with the disposal of project-generated waste are within acceptable limits. Concrete pads will be built to collect wastewater from kitchens and washing areas. Wastewater will flow from the concrete pads into pits where it will be treated before being sprayed over the ground to compact the dust.

Solid waste will be segregated. Most of the garbage plastic, glass, and other non- combustible and recyclable waste will be segregated and supplied to vendors for recycling.. Anything potentially dangerous such as batteries and aerosols will be placed in a separate container, appropriately marked, and disposed of with the proper authority.

Medical waste will be bagged and binned in a separate container appropriately labeled. This waste will be incinerated at nearby available facility. A summary of waste management mechanism is presented in Table 2.6.

Table 2.6: List of Different Type of Waste and Disposal Options

Type of Waste	Description	Disposal Options
Food Waste (putrescible waste)	Animal, fruit or vegetable residues	▪ Food waste to be handed over to waste contractor
Packaging Waste	Paper, plastic, textiles, cardboard, rubber, wood, glass, tin cans, aluminum cans	▪ All Combustible material such as paper, plastic, textiles and non-combustible materials such as glass, tin and aluminum cans to be hauled away by contractor for recycling[(a)]
Medical Waste	Syringes, glass bottles, soiled bandages, expired drugs, dressings	▪ Syringe needles to be cut with cutter and sent for incineration ▪ Soiled bandages and dressings and needles to be sent for incineration ▪ Expired drugs to be taken by contractor for disposal
Workshop Waste	Used oil, ferrous/non-ferrous materials, batteries, oil contaminated top-soil	▪ Used oil, ferrous, non-ferrous materials to be provided to local gasoline stations for reuse ▪ Batteries to be hauled away by contractor for recycling
Demolition Waste	Dirt, concrete, plaster, plumbing, heating and electrical parts	▪ Dirt, concrete and plaster to be buried at site; and ▪ Plumbing, heating and electrical parts to be hauled away by contractor for recycling
Liquid Waste	Wastewater from kitchen and washing areas, sewerage	▪ Wastewater from kitchen and washing areas to be collected in pits before being sprayed over ground to compact dust; and ▪ Sewerage to be treated in a septic tank and soaking pit
Drilling waste	Drill cuttings, excess and spent drilling mud, rig wash water	Cuttings will be stored in a pit on the site. The waste mud will be discharged into a pit at site. The pit will be backfilled after the mud has dried
Well testing waste	Formation water	Stored in a lined pit at the well site. Further disposal by evaporation in the pit and backfilling of the pit after treatment of solid residue, if required.
Well completion	Completion fluid	Prior to disposal, waste fluids will be tested for NEQS. If they are found to conform to NEQS, the fluid will be used as a dust suppressant on the access track and at the well and campsites. If not, then PPL will evaluate other options of disposal, such as evaporation in sidelined pits.
Oil spills /soil contaminated by oil leakages or spills	Contaminated soil	▪ Soil contaminated by minor spills/ leakages (defined as leaks from vehicles, machinery, equipment or storage containers such that the area and depth or soil contaminated is less than 1 sq ft and 3 inches, respectively) will be handed over to a certified contractor for proper disposal. ▪ Moderate spills, defined as spills of a volume less than or equal to 200 liters, will be contained and controlled using shovels, sands, and native soil. The equipment and

Table 2.6: List of Different Type of Waste and Disposal Options

Type of Waste	Description	Disposal Options
		materials will be made available at camp sites and during the operation. The contaminated soil will be excavated and stored in a bonded area lined with an impermeable base. ▪ The contaminated soil will be handed over to a certified contractor for disposal. Major spill of volumes much greater than 200 liters will require the initiation of Emergency Response Procedures. These spills will be handled and will require proper treatment.

[a] *Appropriate monitoring measures will be adopted to ensure that the material is actually recycled*

3.0 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

This chapter highlights the applicable laws, regulations and guidelines with regard to the environmental and social considerations in connection to proposed exploration activities.

The principle law is the Balochistan Environmental Protection Act (PEPA), 2012 that has been implemented with the objective of "protection, conservation, rehabilitation and improvement of environment for the prevention and control of pollution, and promotion of sustainable development.

PPL shall ensure that the operation is conducted to conform to PPL's corporate commitment to the total integration of health safety and social responsibility to environmental excellence in all aspects of its operations to:

- Protect the environment, maintain sustainable development
- Execute all operations for disposal of all materials (hazardous and non-hazardous) safety and without causing any health, environment and safety risk
- Adopt appropriate industry and corporate standards where adequate law or regulations do not exist
- Discontinue any operation if the health, environment or safety is at risk
- Attain high level of preparedness to manage emergency situation.

PPL will adhere to its commitment in environmental policy, national legislation and relevant international conventions and will seek guidance from national and international guidelines. PPL shall also ensure that the key project management staff is aware of these legislations and guidelines.

3.1 National Environmental Policies

3.1.1 National Conservation Strategy

The National Conservation Strategy (NCS) is the primary policy document of the Government of Pakistan (GoP) on national environmental issues. The policy was approved by the Federal Cabinet in March 1992. The Strategy also attained recognition by the 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 mid-term review of the achievement 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 strategy (GoP, November 2000). The need therefore arose for a 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 National Environmental Action Plan was approved by the Pakistan Environmental Protection Council under the chairmanship of the President / Chief Executive of Pakistan in February 2001. NEAP also 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.

The Government of Pakistan and United National Development Program (UNDP) have jointly initiated an umbrella support program called the National Environmental Action Plan-Support Program signed in October 2001 and implemented in 2002. The development objective supported by NEAP-SP is environmental sustainability and poverty reduction in the context of economic growth. The objective of new policy has total 171 guidelines on sectorial and cross sectorial issues. The objectives of new policy include assurance of sustainable development and safeguard of natural wealth of country. The following are the approved Sectorial 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.

3.1.2 National Environmental Policy, 2005

The National Environmental Policy provides and overreaching framework for addressing the environmental issues facing Pakistan, particularly pollution of fresh water bodies and coastal waters, air pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, and loss of biodiversity, desertification, natural disasters and climate change.

It also gives direction for addressing the cross sectional issues as well as the underlying causes of environmental degradation and meeting international obligations.

The National Environmental Policy, while recognizing the goals and objectives of the National Conservation Strategy, National Environmental Action Plan and other existing environment related national policies, strategies and action plans, provide broad guidelines to the Federal Government, Provincial Governments, Federally Administrated, Territories

and Local Governments for addressing environmental concerns and ensuring effective management for their environmental resources.

The National Environmental Policy aims to protect, conserve and restore Pakistan's environment in order to improve the quality of life of the citizens through sustainable development.

3.1.3 National Sanitary Policy, September 2006

The primary focus of sanitation is the purpose of National Sanitary Policy for the safe disposal of excreta away from the dwelling units and work places by using sanitary latrine and includes creation of an open defection free environment along with the safe disposal of liquid and solid wastes; and the promotion of health and hygiene practices in the country.

The objectives of the policy are:

- To ensure an open defecation free environment; the safe disposal of liquid, solid, municipal, industrial and agricultural wastes; and the promotion of health and hygiene practices.
- To link and integrate sanitation programs with city and regional planning policies, health, environment, housing and education.
- To facilitate access of all citizens to basic level of services in sanitation including the installation of sanitary latrines in each house-hold, in rural and urban areas, schools, bus stations and important public places and also community latrines in densely populated areas.
- To promote Community Lead Total Sanitations (CLTS).
- To develop guidelines for the evolution of an effective institutional and financial framework.
- To enhance capacity building of government agencies and other stakeholders at all levels for better sanitation, particularly avoiding incidents of water borne diseases.
- To develop and implement strategies for integrated management of municipal, industrial, hazardous and hospital and clinical wastes of national, provincial and local levels, and
- To meet international/regional obligations effectively in line with the national aspirations.
- To change the attitude and behavior on the use of sanitation.
- To increase mass awareness on sanitation and community mobilization.

The proponent would provide best sanitary facilities to the workers and contractors at the project area.

3.1.4 National Drinking Water Policy

The National Drinking Water Policy provides a framework for addressing the key issues and challenges facing Pakistan in the provision of safe drinking water to the people. The

overall objectives of the policy are to provide guidelines that will allow consistency and conformity in the provision of the drinking water on sustainable basis, provide a financial framework within which the provision of water supply can be undertaken in a cost-effective, equitable and sustainable manner and gives key strategies that will help in enhancing access to safe drinking water supply.

Provision of safe drinking water is the constitutional responsibility of the provincial governments and the specific provision function has been developed to specially created agencies in cities and Town and Tehsil Municipal Administrations under the Local Government Ordinance 2001 and the devolution framework for ensuring access to safe drinking water.

Provision of Safe Drinking Water for the workers and visitors will be ensured at the proposed project site during the construction and operation phase.

3.1.5 The Biodiversity Action Plan

The key to protect the biological heritage of Pakistan lies in the involvement of local people and in the support provided by competent institutions for conservation and sustainable use. The Government of Pakistan has recognized the importance of these measures in the preparation of the National Conservation Strategy and in becoming a signatory to, and ratifying, the Convention on Biodiversity (CBD) in 1994. Developing the Biodiversity Action Plan for Pakistan, 2000 has been the most significant direct step towards addressing the biodiversity loss.

3.2 National Environmental Legislation & Guidelines

3.2.1 Pakistan Environmental Protection Act 1997

Before 18th amendment the Pakistan Environmental Protection Act, 1997 (PEPA) was the basic legislative tool empowering the government to frame regulations for the protection of the environment. After 18th amendment all provinces have constituted their own Environmental Acts and now PEPA is applicable only in federal territory.

3.2.2 Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2000

These regulations were prepared by PEPA. These regulations divide projects in different Schedules depending upon the severity of environmental impact of the project. The project would fall in Schedule I, if the project has lower environmental impacts and thus requiring an IEE. And, the project would fall in Schedule II, if the project has significant environmental impacts and thus requiring an EIA. But, all projects located in environmentally sensitive areas would require an EIA (section 22). Schedule III includes those projects which do not fall in Schedules I and II and do not require an EIA or IEE but require an environmental approval.

The project "Drilling Activities in Kalat Block (2866-2)" falls in Schedule I requiring an IEE as the project is categorized as:

B. Energy

5. Oil & gas extraction projects including exploration, production, gathering systems, separation and storage

These regulations are attached as **Annexure – II**.

The EIA/ IEE report submission and approval procedure is summarized below:

- Ten hardcopies of the EIA/ IEE and two soft copies will be submitted together with a review fee and form included as (Schedule IV of the EIA/ IEE Regulations (section 8).
- The EPA will conduct a preliminary scrutiny and reply within 10 days of the submittal of the report a) confirming completeness, or b) asking for additional information, if needed, or c) returning the report requiring additional studies, if necessary (section 9).
- In case of an EIA; if accepted, the EPA will set a date for public hearing and publish a notice in the print media. According to law, a minimum of 30-day notice is required for the public hearing (section 10).
- The EPA will review the EIA/IEE report and reply within (45 days in case of IEE and 90 days in case of EIA) of the submission of the IEE/EIA report. The agency may require additional information if it deems necessary (section 11).
- The approval granted at the end of the review process, is valid for three years to start construction (section 17).
- The agency keeps the rights of entry & inspection, monitoring and even cancellation of the project (section 18).
- Once the project construction is complete, the proponent is required to submit a request to EPA for confirmation of compliance. An environmental management plan for the operation phase is to accompany the request (section 19).
- The EPA is required to communicate its decision within 15 days of receipt of the request. The project can commence operation only after it has received approval from the EPA (section 20).

3.2.3 National Environmental Quality Standards (NEQS)[1]

The NEQS are uniform standards applicable to all kind of industrial and municipal effluents. Different Parameters are set showing permissible levels of pollutants in liquid effluents and gaseous emissions. These were first promulgated in 1993 and were last revised in 2000. To enforce NEQS, Government has been empowered to levy a pollution charge.

[1] *National Environmental Quality Standards, 10th February 2000, section 33 of the XXXIVS.R.O. 258-(1)/2000*

For liquid effluents, there are 32 parameters showing permissible level of pollutants before its discharge into sea, inland water & sewage. And, for gaseous emissions, there are 16 parameters.

The National Environmental Quality Standards for municipal and industrial liquid effluents, gaseous emissions, motor vehicle exhausts and noise are attached as **Annexure – III**.

The National Environmental Quality Standards for drinking water quality and noise (SRO 1062 (I)/2010 are also in force and its compliance is mandatory and are also attached as **Annexure III**.

3.2.4 Hazardous Substances Rules, 2003[2]

These Rules were notified in 2003 to stream line procedures for issuance of licenses to industries/ businesses that generate hazardous waste and devices them methods for the removal of hazardous wastes in an environmental friendly manner. The rules also specify procedures to be adopted for disposal of hazardous waste and identify two hundred and forty-two hazardous substances and synthetic chemicals.

3.2.5 The Forest Act 1927

The Act is applicable to all regions of Pakistan. It includes procedures for constituting and managing various types of forests, such as reversed forests and protected forests.

The Act empowers the provincial forest departments to declare any forest area as reserved or protected. It also defines the duties of forest related public servants, and penalties of any infringement of the rules.

The project is not a part of any protected or reserved forest, mentioned in Forest Act, 1927. Harboi Juniper forest is at a distance of 30 km in the north of the Wells.

[2] *Hazardous Substances Rules, 2003, faolex.fao.org/docs/pdf/pak64438.pdf*

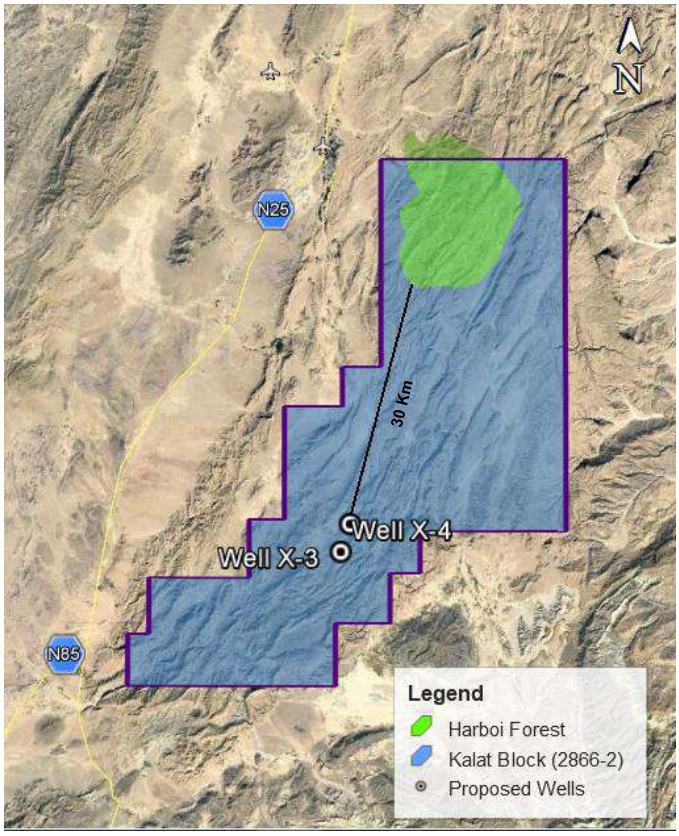

Figure 3.1: Location of Harboi forest and Well Sites.

3.2.6 Antiquities Act 1975

The protection of cultural resources in Pakistan is ensured by Antiquities Act of 1975. Antiquities have been defined in the Act as ancient products of human activity, historical sires, or sites of anthropological or cultural interest, national monuments etc.

The Act is designed to protect antiquities from destruction, theft, negligence, unlawful excavation, trade and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area which may contain articles of archeological significance.

The project area does not contain any sites notified as protected under this Act. However, if any artifacts and relics of historical, cultural or religious importance are discovered, then the Act requires to immediately inform the concern person.

3.2.7 Land Acquisition Act, 1894

The Land Acquisition Act (LAA) of 1894 amended from time to time has been de facto 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 of development projects. It comprises of 55 sections pertaining to areas notifications and surveys, acquisition, compensation and apportionment awards and disputes resolution, penalties and exemptions.

3.2.8 Pakistan Penal Code (1860)

The Pakistan Penal Code (1860) authorizes fines, imprisonment or both for voluntary corruption of fouling of public springs or reservoirs as to make them less for ordinary use.

3.2.9 The Pakistan Environmental Assessment Procedures 1997

The Pakistan Environmental Protection Agency prepared the Pakistan Environmental Assessment Procedures in 1997. The guidelines to the review process of EIA's have been given regulatory status in the Review of IEE and EIA Regulations 2000. The package of regulations prepared by PEPA includes:

- Policy and procedures for Filing, Review and Approval of Environmental Assessments;
- Guidelines for Preparation and Review of Environmental Reports;
- Guidelines for public Consultation;
- Guidelines for Sensitive and Critical Areas; and
- Sectorial Guidelines – Oil and Gas Exploration and Production.

The guidelines on policy and procedures define the policy context and the administrative procedures that will govern the environmental assessment process, from the project prefeasibility stage, to the approval of the environmental report. According to the procedures laid out in the policy guidelines, IEE's or EIA's are to be filed to the EPA of the province where the project is to be implemented. The Federal EPA has, however, been given the right to review any environmental report at any time and the power to revoke the decision of the Provincial EPA, if it deems this to be necessary.

Projects have been classified in the policy guidelines by expected degree of adverse environmental impacts. All projects proposed in environmentally sensitive areas (including Game Reserves and Wildlife Sanctuaries) require an EIA. After 18th Amendment, this act is not valid for provinces as they have passed their own environmental acts.

The Procedures required proponents to prepare terms of reference for the environmental assessment reports. They required all the studies should contain an assessment of the potential environmental impacts and the recommended mitigation measures.

The guidelines on public consultation deals with possible approaches to public consultation and techniques for designing and effective program of consultation that reaches out of all major stakeholders and ensure the incorporation of their concerns in any impact assessment study.

3.2.10 The Cutting of Trees (Prohibition) Act, 1992[3]

The Cutting of trees (prohibition) Act, 1992 mandates that no person shall, without prior written approval from authorized officer shall cut, fell or damage trees growing in:

[3] *The cutting of Trees(prohibition) Act, 1992, Act No. XVIII of 1992*

This does not apply to a tree growing on land occupied as the site of a town or village or in a dwelling-house.

Section 3: It prohibits any person, without prior approval, from cutting, felling or damaging any tree growing in first and second zones as mentioned above.

Section 4: It imposes penalty of fine which may extend to five thousand rupees for contravention relating to first zone and imposes penalty of fine which may extend to two thousand and five hundred rupees for contravention relating to second zone.

3.2.11 Canal and Drainage Act, 1873[4]

Canal and Drainage Act, 1873 prohibits the corruption or fouling of water canals (defined to include channels, tube wells, reservoirs and water courses) or obstruction of drainage.

3.2.12 Mines Act, 1923

This Act relates to the regulation, inspection and occupational health and safety aspects of mines. The above Act has stipulations with respect to working hours, occupational diseases, periodic medical checkups, employment of female and children, employment of medical and welfare officers etc. Various provisions of this Act are discussed as under:

Section 4: A Chief Inspector (CI) and inspectors of mines are appointed.

Section 6: The Chief Inspector and Inspectors of mines have powers to enforce this Act and they may enter, inspect and examine any mine for ventilation, bye-laws, safety (health & welfare of staff) and may take any material and substance for analyses.

Section 12: Mining Board shall have powers of Civil Court for the purpose of deciding or reporting any matter referred to it.

Section 14, 15 & 16: Related to management of mining operations and fixes duties and responsibilities of managers, owners and agents of mines.

Section 17 to 22: Related to provisions of health and safety. These provisions require conservancy, canteens, shelters, medical appliances, first aid rooms etc. CI or Inspectors may give notice to mines if they find that any matter, thing or practice in or connected with mine is dangerous to human life, health or safety etc. and need to be remedied. Mine management is required to report any accident, loss of life or influx of inflammable or noxious gases etc. to appropriate authorities.

Section 22 (A&B): Limits the time of work for any person in a mine to a maximum of six days a week and not more than forty-eight hours in any week and not more than eight hours in a day.

Section 23-C: Bans the appointment of woman in any part of mine below ground. For above ground work, woman shall not work from 7 pm to 6 am.

Section 26: Prohibits child labor in a mine.

[4] Canal and Drainage Act, 1873

Section 34 to 44: Imposes penalties on any person who violates any of the provisions of this Act such as obstructs work of CI or Inspectors, falsifies records, omits to furnish plans, contravenes provisions regarding employment of labor, notice of accidents or disobeys orders etc. with imprisonment or fine or both.

3.2.13 National Mineral Policy, 1995[5] and 2013[6]

Realizing the importance of minerals in the development of any country, the Government of Pakistan has formulated National Mineral Policy offering appropriate institutional arrangements, investment friendly regulatory regime and internationally competitive fiscal incentives. The main objectives from expansion of mineral sector activities are expansion of employment opportunities, sustainable development of mineral bearing area, expanded business opportunities, technology transfer and regional infrastructure development etc.

Under Constitution, minerals are a provincial subject except oil, gas and nuclear minerals and those occurring in special areas (FATA and NA). Provincial Governments are responsible for development and exploitation of minerals, which fall in their domain. The main sections of National Mineral Policy, 1995 are as mentioned under:

Section 4.3.2: A Mineral Investment Facilitation Authority (MIFA) will be setup in each province headed by Chief Minister and other members such as Minister for Mineral Development, Chief Secretary and Secretary Mineral Development Department etc. MIFA shall ensure regular monitoring and direction of mineral related activities, periodic review of the new regulatory regime and ensure adequate protection of environment etc.

Section 4.3.3: Each mineral rich province will establish a separate Department of Mineral Development under separate Secretary for development of mineral resources, consideration of applications and grant of license and leases, regulating and monitoring mining operations etc.

Section 4.4: Mineral Investment Facilitation Board (MIFB) headed by Prime Minister and members including Federal Minister for Petroleum & Natural resources, Governor NWFP, all CMs etc. for development of mineral resources not only on fiscal policies but also in international contacts with donor agencies and negotiation of mineral agreements.

Other Sections: Section 4.5 refers to Public Sector Mineral Corporations, Section 4.6 refers to Geological Survey of Pakistan (GSP), Section 4.7 refers to Geo-Data Centre of Pakistan (GDCP), Section 4.8.3 mentions about Reconnaissance License (RL), Section 4.8.4 refers to Exploration License (EL), Section 4.8.6 enumerates conditions for Mining Lease (ML), Section 4.8.7 covers environmental issues and protection of environment from mining activities etc.

Major sections of National Mineral Policy, 2013 related to the proposed project are as described below:

[5] National Mineral Policy 1995,
[6] National Mineral Policy 2013

Section 1: The main objective of National Mineral Policy, 2013 is to endeavor for increasing the economy, competitiveness, coordination & exploration, development & production of Pakistan's mineral resources and encouraging small scale mining.

Section 3: Mineral Investment Facilitation Authorities (MIFAs) are established at both Federal and Provincial level. A Licensing Division, the Provincial Directorates General of Mines & Minerals, exploration & Coordination Directorates, Exploration Promotion Divisions, the Directorates General of Mines and Minerals (which will provide interface with international investors; identify mineral prospects; compile, evaluate and disseminate geo-data etc.).

Section 4: A Mineral Investment Board (MIB) headed by Prime Minister (with all CMs as members) will be established as a consultative forum to encourage the flow of investments, assist Provincial Governments, recommend on fiscal and taxation policies etc.

Section 5: Geological Survey of Pakistan (GSP) is charged with the responsibility of availability of geological, geophysical and geochemical maps and reliable geo data and research.

Section 6: A Geo-data Centre of Pakistan (GDCP) will perform the functions such as managing and disseminating geo-data; creating a centralized digital map production and distribution facility; training; links with Provincial Departments etc.

Section 7: The Provincial Mineral Concession Rules, 2002 which flowed out of the 1995 National Mineral Policy, were a positive step towards modernizing the existing regulatory regime, providing for mineral titles, development and exploitation of any mineral deposits; eliminating discretionary powers, and ensuring simplicity and transparency; and updating the mining laws to deal with international mining practices in Pakistan such as open pit mining and working practices.

Companies will be expected to ensure that their mining operations are carried out in an environmentally acceptable and safe manner. The holder of a mineral title shall have certain exclusive rights for example the right to enter upon the licensed/leased area and to carry out reconnaissance etc. The Provincial Governments may enter into an agreement (Mineral Agreement) with an investor, with respect to certain matters relating to the carrying out of operations under license/lease. Any question or dispute shall be handled through dispute resolution mechanism. The award of mineral title would be made through a transparent process.

Section 8: Mining activities being carried out in Pakistan are mainly through small scale mining by sole proprietorships, association of persons (partnerships) and in certain cases by private limited liability companies. These would prepare their financial statements in accordance with International Financial Reporting Standards.

Section 9: Rate of royalty for minerals will be determined by respective governments from time to time.

Section 11: Development of Infrastructure in mineral bearing areas would be given due regard.

Section 17: Provincial Inspectorates of Mines will carry out the various functions such as enhancing health and safety, research and development.

Section 19: Miscellaneous Matters such as protection of Foreign Investment and insurance for mining operators.

Section 20: The respective Federal and Provincial Ministries/Departments will take all measures to give full effect to the provisions of this Policy.

3.2.14 The Explosives Act, 1884

This Act has been formed to regulate the manufacture, possession, use, sale, transport and importation of explosives. An explosive has been defined (Section 4(a) as the gunpowder, nitroglycerine, dynamite, gun-cotton, dinitro-toluene ,trinitro toluene, picric acid, dinitrophenol, trinitro resorcinol (styphnic acid), cyclotrimethylence trinitramine, penta erythritol tetranitrate, tetryl, nitroguanidine, lead azide, lead styphynate, blasting powders, fulminate of mercury or of other metals, diazo dinitro phenol, colored fires and any other substances, whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous, used or manufactured with a view to produce a practical effect by explosion, or a pyrotechnic effect.

Section 5: Government may make rules to regulate, prohibit, manufacture, possess, use, transport, import or export explosives or any specified class of explosives. The following matters may be provided for:

a) the authority by which licenses may be granted,
b) the fees to be charged,
c) The manner in which application for licenses must be and the matters to be specified in such applications etc.

Section 6: Government may from time to time, either absolutely or subject to conditions, prohibit manufacture, possess, transport, import and export etc. any explosive.

Section 7: Government may make rules consistent with this Act authorizing any officer to enter, inspect, seize and examine etc. any place, carriage etc. in which an explosive is being used or sold etc.

Section 8: Any explosion by fire that causes loss of human life, serious injury to person or property etc. must be reported by the occupier or master etc. to Secretary Home Department and to the nearest police station.

Section 9: District Magistrate shall, in cases attended by loss of human life, or in any other case, direct a Magistrate Subordinate to hold an inquiry.

Sections 10 to 14: These sections deal with forfeiture of explosives by court; distress of aircraft or vessel; punishment for abetment and attempts; power to arrest without warrant

persons committing dangerous offence; saving and power to exempt (to armed forces, person employed under the Government for enforcement of this Act or by notification etc.) respectively.

Section 19: Transportation of explosives by air shall be carried out in accordance with rules and regulations of International Civil Aviation Organization (ICAO), International Air Transport Association (IATA) and Civil Aviation Authority of Pakistan (CAA).

3.2.15 The Explosive Substances Act, 1908

The Explosive Substances Act, 1908 deals exclusively with the acts of explosions or intentions to cause explosions and gives detail of the punishments to be awarded to the non-complier.

This law regulates the possession and use of explosive substances, including materials for the manufacture of explosives as well as machinery, tools and materials that can be used to cause an explosion (Section 2). Causing an explosion is punishable with a maximum sentence of life in prison, whether or not the event causes any injury to persons or damage to property (Section 3). The same maximum penalty applies to making or possessing explosives with intent to cause an explosion (Section 4). Although the law does not specify conditions under which it is legal to possess explosive materials, possession of such substances for a purpose that is not "lawful" is an offence (Section 5), implying that some form of regulatory mechanism is to be put in place. Powers under this Act have been delegated to provincial governments, which may restrict or allow the courts to proceed with the trial of suspected offenders (Section 7).

3.2.16 The Petroleum Act, 1934

This Act deals with the import, transport, storage, production, refining and blending of the petroleum products (chapter 1: Control over petroleum). Chapter 3 of this Act tells about the general penalties for the offenses under this Act, reports of accidents with petroleum and inquiries into serious accidents with petroleum. This Act specifies the nature and condition of pipelines in which the petroleum may be transported and the forms and conditions of licensing for the transport and storage of petroleum products.

3.2.17 Petroleum Policy, 2001

Pakistan has developed a comprehensive petroleum policy in 1997 to promote petroleum business in the country. This policy elaborates the importance and view of Pakistan with regards to exploration, production, refining, marketing and distribution of petroleum products in Pakistan as well as procedural/ regulatory measures, economic terms, infrastructure development, environment and safety control, energy conservation, contingency plan, etc. Relevance of this document in conjunction to IEE is the subsection 3.2 (Energy conservation, Environment and safety Control) as well as sub section 3.4 (contingency plan). Clauses B & C of sub section 3.2 focuses on applicability of the environmental and safety regulations and to provide safety hazards at oil/ gas fields and other oil/ gas installations.

3.3 Provincial Environmental Legislation and Guidelines

3.3.1 Balochistan Environmental Protection Act, 2012

As a result of the 18th amendment to constitution of Pakistan, the Baluchistan Environmental Protection Act, 2012 (amended) is now the principal provincial legislation in Baluchistan for the:

1. Protection, conservation, rehabilitation and improvement of the environment,
2. Prevention and control of pollution, and
3. Sustainable development.

Baluchistan Environmental Protection Act, 2012 is (currently) the basic legislative tool empowering the Government of Baluchistan to frame regulations for protection of the environment in the province of Baluchistan.

The Act is broadly applicable to air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. Penalties have been prescribed for those who contravene the provisions of the Act. Powers of the Baluchistan Environmental Protection Agency (BEPA) have been considerably enhanced under this legislation and they have been given the power to conduct inquiries into possible breaches of environmental laws either of their own accord, or upon registration of a complaint.

Under Section 15 of Act, "No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination with the Government Agency designated by Baluchistan Environmental Protection Agency, as the case may be, or, where the project is likely to cause an adverse environmental effects an environmental impact assessment, and has obtained from the Government Agency approval in respect thereof".

It is attached in **Annexure-I** in this IEE report.

3.3.2 Baluchistan Local Government Ordinance, 2001

Under Clause 48 of the 6th Schedule of this Ordinance, the local governments are empowered to restrict any project causing pollution to air, water or land. They may also initiate schemes for improving the environment vide this legislation. The local government offices at union council level are given the authority through this law, to monitor any polluting activity and issue instructions to the responsible person for undertaking pollution prevention measures. PPL QHSE will be responsible to ensure that the proposed drilling activities of Kalat X-3 and X-4 Wells in Kalat Block (2866-2) are undertaken in accordance with the environmental management requirements and recommendations given in this IEE as well as the NOC which will be issued for this project.

3.3.3 Baluchistan Local Government Act, 2014

The Act was enforced to provide for the constitution and continuance of Local Government Institutions in Baluchistan, and to consolidate law relating to the Local Government and to provide for the matters connected therewith and ancillary thereto. Article 32 requires the State

to encourage Local Government Institutions composed of elected representatives of the areas concerned and having special representation of peasants, workers and women. The Constitution requires the provincial government to decentralize the government administration under Article 140-A so as to facilitate expeditious disposal of its business to meet the convenience and requirements of the public.

Section 7: This section provides for the Constitution of Local Councils i.e. there shall be a Union Council for each Union; a District Council for each District; a Municipal Committee for each Municipality; a Municipal Corporation for each City; and a Metropolitan Corporation for the Capital City.

Section 10: This section provides for Composition of Local Councils consisting of different members in these councils such as general members, non-Muslim members, members from workers and women etc. There shall also be chairmen elected from amongst the members. The number of these members would vary such as general members may be seven to fifteen in union councils and thirty to fifty for a municipal corporation.

Sections 13 to 62: These sections describe detailed process of conducting local government elections including election of chairmen etc.

Sections 63 to 68: These sections provide for executive powers of local government and manner of conduct of business. The executive authority shall be exercised by chairmen or the mayor as the case may be. The business shall be disposed at its meeting.

Sections 69: This section provides for local council service.

Section 70: This section provides for Baluchistan Local Government Board.

Sections 78 to 85: These sections state that local councils may undertake any or all of the functions mentioned in fifth schedule.

Section 86: This section states that Development Plans in local councils shall be prepared on specified sectorial pro-forma mentioning name and location of project, cost, objectives and justification etc.

Section 96 to 106: These sections provide for local fund and public account for every council, budgets, application of funds, account and audits etc.

Sections 107 to 111: These sections provide for ownership of property, use and disposal of property etc.

Section 112 to 119: These sections provide for rules related to local council taxation.

Section 120 to 122: These sections provide for constitution of local grant committee headed by Minister Finance with Secretaries of Finance, P&D etc. for award of grant to local councils.

Remaining sections relate to supervision of local councils, divisional co-ordination committee and inter council matters, offences and penalties and appointment of whole time Magistrates etc.

Fifth Schedule (Section 78): Under 5th Schedule of this Act, the Urban Councils are required to undertake preparation and implementation of schemes for the prevention of the pollution of air, water, land gases, dust or other substances exhausted or emitted by automobiles, engines, factories, brick or lime kilns, crushing machines for grains, stone, salt or other materials and such other sources of air pollution. In continuation to this, the urban councils are responsible to keep a check on activities within its jurisdiction to ensure that the same does not result in contamination or pollution of the natural ambient environment.

The proponent of the proposed project will comply with all the clauses of Baluchistan Local Government Act 2014 related to the proposed project.

3.3.4 Baluchistan Wildlife (Protection, Preservation, Conservation and Management) Act, 2014

The Baluchistan Wildlife (Protection, Preservation, Conservation, and Management) Act, 2014 caters to the protection of wildlife resources in the province. Besides ensuring an environment conducive for their rearing and livelihood, the Act also regulates hunting, poaching, possession, and trade in birds and animals. Government can notify and amend lists of protected ecosystems, national parks, wildlife sanctuaries, safari parks, and game reserves.

1. Ban on hunting of protected animals unless permitted otherwise in accordance with the requirements of the Act.
2. Prohibition of any activity (residence, cultivation, land use that could damage vegetation, hunting, killing or capturing of any wild animal etc.), inside a wildlife sanctuary or National Park.
3. Prohibition of any activity (hunting and shooting etc. of a wild animal) in the game reserve, except under a special permit.
4. Penalties for those who contravene the provisions of the law.

The latest Act, 2014 was passed by the Baluchistan Assembly to seek measures by the provincial government to curb poaching of endangered wildlife species. According to the Act, no person will possess and use any wild animal for fighting or baiting with other wild animal of the same or other species or with any other kind of animal. No one should put, keep or carry in a cage or enclosure any wild animal which is not big enough for its movement and comfortable living, transport or handling. The Act mentions a game animal may be hunted only with a valid license or permit, as the case may be, subject to restrictions and no person will hunt any game animal in the privately-owned areas. It further mentions that a person should not keep any wild animal, dead or alive or its parts unless the person is in possession of a valid certificate of lawful possession granted in respect thereof by the authorized officer. According to the law, a person will not import or attempt to import into province any animal of an indigenous or exotic species, or any trophy, meat or derivative thereof, except under an import permit granted under this Act.

PPL shall implement a "No hunting, no trapping" policy for protection of wildlife existing in the project area. Land clearing for drilling will be undertaken by adopting "soft start" approach in order to slowly move away the animals inhabiting the project area. Burrows, dens and other habitats of animals will not be destroyed during project activities. Besides these, additional

measures such as fencing of activity area, containment of waste materials etc. will also be adopted to prevent any possible harm to the wildlife.

3.4 National Legislation on Oil and Gas Exploration and Production

3.4.1 The Regulation of Mines and Oilfields and Mineral Development (Government Control) (Amendment) Act, 1976

The Regulations of Mines and Oilfields and Mineral Development (Government Control) Act, 1948 and the Pakistan Petroleum (Production) Rules, 1949 and Pakistan Petroleum (Exploration and Production) Rules, 1986 empowers the Ministry of Petroleum to oversee the petroleum exploration, development and production operations.

3.4.2 The Model Petroleum Concession Agreement, 2009

As for safety, the Model Petroleum Concession Agreement (2009) implementing the 1986 Exploration and Production Rules, specifically required observance of the 1974 Safety regulations. The penalties imposed in the 1986 Exploration and Production Rules allow the Director General Petroleum Concession to revoke a license if the rules are not satisfied by the operator. The Mines and Oil Field Act also specifies penalties including imposition of fines and/or imprisonment.

3.4.3 The Pakistan Petroleum (Exploration and Production) Rules, 2013

In exercise of the powers conferred by section 2 of the Regulation of Mines and Oil fields and Mineral Development (Government Control) Act, 1948 (Amended 1976), the Federal Government is pleased to make the following rules, namely: **The Pakistan Petroleum (Exploration and Production) Rules, 2013.**

The section 58 of the rule states "A holder of petroleum right shall undertake to execute all operations in a proper, prudent and diligent manner, in accordance with good international oilfield practices and shall not unreasonably obstruct or interfere with other activities such as navigation, fisheries and agriculture. All reasonable precautions shall be taken to prevent pollution or damage to the environment and surroundings.

3.4.4 Petroleum Exploration and Production Policy, 2012

The purpose of this Petroleum Exploration and Production policy 2012 (Policy) is to establish the policies procedures, tax and pricing regime in respect of petroleum exploration and production (E&P) sector.

The principal objectives of this Policy are:

- To accelerate E&P activities in Pakistan with a view to achieve maximum self – sufficiency in energy by increasing oil and gas production.
- To promote direct foreign investment in Pakistan by increasing the competitiveness of its terms of investment in the upstream sector.

- To promote the involvement of Pakistani oil and gas companies in the country's upstream investment opportunities.
- To train the Pakistani professionals in E&P sector to international standards and create favorable conditions for their retaining within the country.
- To promote increased E&P activity in the onshore frontier areas by providing globally competitive incentives.
- To enable a more proactive management of resources though establishment of a strengthened Directorate General of Petroleum Concessions (DGPC) and providing the necessary control and procedures to enhance the effective management of Pakistan's petroleum reserves.
- To ensure the energy secure of the country by enhancing domestic exploration.
- To decrease reliance on imported energy by providing additional incentives to exploration and production companies for enhancing indigenous production.
- To undertake exploitation of oil and gas resources in a socially, economically and environmentally sustainable and responsible manner.

3.4.5 The Oil and Gas (Safety in Drilling and Production) Regulations, 1974

The 1974 Safety Regulations requires operators to send to the Chief Inspector of Mines, Ministry of Labor and Manpower information on safety issues including provisions of protective equipment and identification of safety personnel and emergency measures, designation of safety personnel including Warfare and Safety Officer, and accident reporting.

The regulation identifies and explains issues that should be taken into consideration by the proponent for a project involving exploration or production of oil and gas.

3.4.6 Sectoral Guidelines for Environmental Reports – Oil and Gas Exploration and Production

These guidelines identify and explain issues that should be addressed for a proposal involving exploration for, or production of, oil and gas. It is important to focus on key issues for specific proposals. The matters identified in this guideline should provide guidance for the preparation and assessment of most exploration and production proposals. It is intended that Companies involved in Oil and Gas Exploration and Production will self-regulate and undertake monitoring to meet or exceed the provisions of the Package and these sectorial guidelines; the Responsible Authority reserves the right to spot check field operations from time to time.

"Drilling Activities in Kalat Block 2866-2, Baluchistan" project, based on its low severity, falls under the Schedule-I for the classification of industrial units for liquid effluents in **Category "A" (20) Oil and Gas Production** under reporting procedures for SMART rules. Quarterly environmental monitoring reports on priority parameters will be sent to the relevant authorities as per the requirements of IEE approval.

3.5 International Treaties and Guidelines

3.5.1 World Bank Guidelines on Environment

The principal World Bank publications that contain environmental guidelines as listed below:

- Environmental Assessment-Occupational Policy 4.0.1. Washington, DC, USA. World Bank 1999
- Environmental Assessment Sourcebook, Volume I: Policies, Procedures, and Cross-Sectorial Issues. World Bank Technical Paper Number 139, Environmental Department, the World Bank, 1991.
- Environmental Assessment Sourcebook, Volume III: Guidelines on Environmental Assessment of Energy and Industry Projects: World Bank Technical Paper No. 154, Environment Department, the World Bank, 1991.
- Pollution Prevention and Abatement Handbook: Towards Cleaner Production, Environmental Department, the World Bank, United National Industrial Development Organization and the United National Environmental Program, 1998.

The first two publications listed here provide general guidelines for the conduction of an EIA, and address the EIA practitioner themselves as well as project designers. While the Sourcebook in particular has been designed with Bank projects in mind and is especially relevant for the impact assessment of large scale infrastructure projects, it contains a wealth of information which is useful to environmentalists and project proponents.

The Sourcebook identifies a number of areas or concern, which should be addressed during impact assessment. It sets out guidelines for the determination of impacts, provides a checklist of tools to identify possible mitigation measures. Possible development project impact on wild lands, wetlands, forests etc. are also identifies and mitigation measures suggested. The Sourcebook also highlights concerns in social impact assessment, and emphasis the need to incorporate socio-economic issues in EIA exercise.

The Sourcebook dealing with the assessment of industry and energy projects is more specific. It contains a section on onshore development of Oil & Gas and identifies the potential environmental impacts of Exploration & Production activities. These include surface disturbance from the building of access roads in undisturbed areas, disturbance from explosive charges and possible damage to cultural resources. Possible socio-cultural issues that may arise as a result of an influx of non-locals are also identified in the Sourcebook.

The Pollution Hand Book provides general waste management policies with specific techniques for the prevention of air and water pollution. Projects guidelines are presented for major pollutants as well as typical emissions from industry sector including oil and gas.

The EHS guidelines published by IFC are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects.

They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimizing and controlling EHS impacts during construction and operation phase of a project or facility.

The World Bank Guidelines for noise are provided in Table 3.1 and 3.2.

Table 3.1: World Bank Guidelines for Noise Levels [a]

No.	Receptor	Day (07:00-22:00)	Night (22:00-07:00)
1.	Residential, institutional educational	55	45
2.	Industrial, commercial	70	70

Source: Pollution Prevention and Abatement Handbook World Bank Group (1998)
Notes: [a] Maximum allowable log equivalent (hourly measurements) in dB(A)

Table 3.2: WHO Guideline Values for Community Noise in Specific Environments

Specific Environment	$LA_{eq.}$ (dB)	Averaging Time (hours)	LA_{max}, Fast (dB)
Outdoor living area	55	16	-
Dwelling (indoors)	35	16	-
School classrooms (indoors)	35	During Class	-
Hospital, ward rooms, night time (indoors)	30	8	40
Industrial, commercial, shopping and traffic areas (indoors and outdoors)	70	24	110

3.5.2 IUCN Red List

The Red List is published by IUCN and includes those species that are under potential threat of extinction. These species have been categorized as:

- **Endangered:** species that are observed to be facing a very high risk of extinction in the wild in the near future, reduction of 50% or more either in the last 10 years or over the last three generations, survive only in small numbers, or have very small populations.
- **Vulnerable in Decline:** species that are observed to be facing a risk of extinction in the wild, having apparent reduction of 20% or more in the last 10 years or three generations.
- **Vulnerable:** species that are observed to be facing a high risk of extinction in the wild, but not necessarily experiencing recent reduction in population size.
- **Lower Risk:** species that are observed to be facing a risk of extinction that is lesser in extent that for any of the above categories.
- **Data Deficient:** species that may be at risk of extinction in the wild but at the present time there is insufficient information available to make a firm decision about its status.

3.5.3 The Convention on Biological Diversity

The Convention on Biological Diversity was adopted during the Earth Summit of 1992 at Rio de Janeiro. The Convention requires parties to develop national plans for the conservation and sustainable use of biodiversity, and to integrate these plans into national

development programs and policies. Parties are also required to identify components of biodiversity that are important for conservation, and to develop systems to monitor the use of such components with a view to promoting their sustainable use.

3.5.4 The Convention of Conservation of Migratory Species of Wild Animals, 1979

The Convention on the conservation of Migratory Species of Wild Animals (CMS), 1979, requires countries to take action to avoid endangering migratory species. The term "migratory species refer to the species of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries. These parties are also required to promote or co-operate with other countries in matters of research on migratory species.

The Convention contains two appendices. Appendix I contain the list of migratory species that are endangered according to the best scientific evidence available. For these, species the member states to the Convention are required endeavor to:

- Conserve and restore their habitats
- Prohibit their hunting, fishing and capturing, harassing and deliberate killing.
- Remove obstacles and minimize activities that seriously hinder their mitigation.
- Control other factors that might endanger them, including control of introduced exotic species.

The migratory species, or group of species, that have an unfavorable conservation status as well as those that would benefit significantly from the international co-operation that could be achieved through intergovernmental agreements.

3.5.5 Convention on International Trade in Endangered Species of Wildlife Fauna and Flora

The Convention came into effect on 03 March 1973 in Washington. In all 130 countries are signatory to this Convention with Pakistan signing the convention in 1976. The Convention requires the signatories to impose strict regulation (including penalization, confiscation of the specimen etc.) regarding trade of all species threatened with extinction or that may become so, in order not to endanger further their survival.

The Convention contains three appendices. Appendix I include all species threatened with extinction which are or may be affected by trade. The Convention requires that trade in these species should be subject to strict regulation. Appendix II includes species that are not necessarily threatened presently but may become so unless trade in specimens of these species is subject to strict regulation. Appendix III includes species which any contracting party identifies as subject to regulations in trade and requires other parties to co-operate in this matter.

3.6 Pakistan Petroleum Exploration and Production Companies Association (PPEPCA)

PPEPCA is an association of private sector companies and semi-autonomous departments concerned with exploration and production of Oil & Gas. It provides a forum for such companies to discuss issues, formulate common strategies and convey concerns and demands the government and other stakeholders in the Oil & Gas business.

PPEPCA has also been particularly effective in collecting and disseminating information in current trends in exploration and production to its members, and has been instrumental in informing members of changes in government policy and in formulating a response to such policy changes.

4.0 ENVIRONMENTAL AND SOCIAL BASELINE

4.1 General

Kalat Block (2866-2) has been awarded to PPL by the Government of Pakistan for the purpose of oil and gas exploration. PPL plans to drill two (02) exploratory Wells, Kalat X-3 and X-4, which is at the south of the Kalat Block. Although, Kalat Block falls in two districts of Balochistan province i.e. Kalat and Khuzdar, the Wells KalatX-3 and X-4 are located in district Kalat. Therefore, this IEE study focus on the impacts of drilling activities on the physical, biological and socioeconomic environment of district Kalat only.

The physical, biological and socioeconomic environment of the project is described with respect to watershed, air shed, geology, soil characteristics and seismicity. The air shed describes the climatic conditions and quality of the air, the water shed describes the water quality of surface and ground water. The terrestrial environment is described by its geology, geomorphology, wild life habitat, vegetation and soil characteristics in terms of stability and seismicity. Description of the socioeconomic environment includes details of the area's population and households, education, health, gender issues, water supply, agriculture, transport and communications, and occupations and income.

4.1.1 The Aim of Baseline Study

This section provides a comprehensive profile of the surrounding environment of the Wells Kalat X-3 and X-4 situated in the South of Kalat Block (2866-2) in district Kalat of Balochistan province. The study will cover the physical, biological and socio-economic micro and macro environment of the Well location prior to the commencement of various activities related to Well drilling operations.

This categorization would aid in understanding the prevalent macro and micro environment of this project and would enable assessment of possible environmental impacts that may arise as a result of the activities associated with the project. It would also assist the design team in defining the mitigation measures that would be required to minimize if not eliminate the negative impacts which are pointed out in this study.

4.1.2 Methodology

The baseline data collected in this section is based on primary and secondary sources. Primary data obtained from field visits, site surveys and assessed the existing environmental conditions on site by EMC experts. The secondary data based on the literature review of past studies, research conducted in the areas, electronic and print media information, maps prepared by the Geological survey of Pakistan and Soil survey of Pakistan, District Census Reports (DCRs) and other information in districts and archives of the experts.

4.2 Physical Environment

4.2.1 Geographical location

District Kalat has an area of 13,851 square kilometers and is part of Kalat Division of Balochistan Province. District Kalat has three Tehsils namely Kalat, Surab and Mangochar and two sub tehsils viz. Johan and Gazg. District head quarter, Kalat, is situated 160 km South from Quetta city. District Kharan is situated in the West of District Kalat, District Washuk is in the Southwest, District Khuzdar is in the South and Southeast, District Mastung is in the Northwest and District Kachhi is in the East-Northeast of District Kalat. District Khuzdar is surrounded by District Jhal Magsi, Qamber Shahdadkot and Dadu in the East, District Kachhi in the Northeast, District Kalat in the West-Northwest, District Washuk in the West, District Awaran in the South-Southwest and District Lasbela in the South.

The proposed location of Well Kalat X-3 and X-4 is at the south of Kalat Block in Tehsil Kalat, District Kalat, Balochistan. The Wells are 2.0 km west from District Khuzdar boundary.

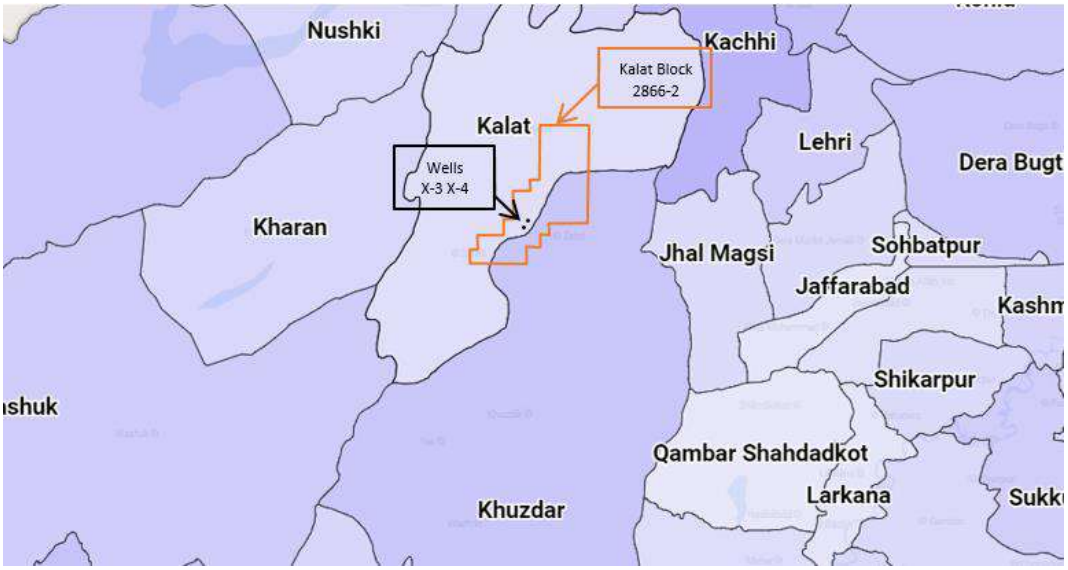

Figure 4.1: Location Map of Well Kalat X-3 and X-4

4.2.2 Topography

The Geographically, the district is mountainous and consists of a series of parallel mountain ranges running in north-west. Some valleys are of considerable elevation varying from 1,525 to 1,982 meters above sea level. The main valleys in the area are of Mangochar and Chappar in the western part of district.

The boundary with Khuzdar runs along the southern slopes of the Gurgina pass including the southern spurs of Sarum lib north-west of Gazg, and then across Tahlagan valley into Tharboi lib. The KohKlloes and Jalois of Lop valley are included in the district. There is only one river in the district called Moro, which passes through *Tehsil* Johan towards District Mastung.

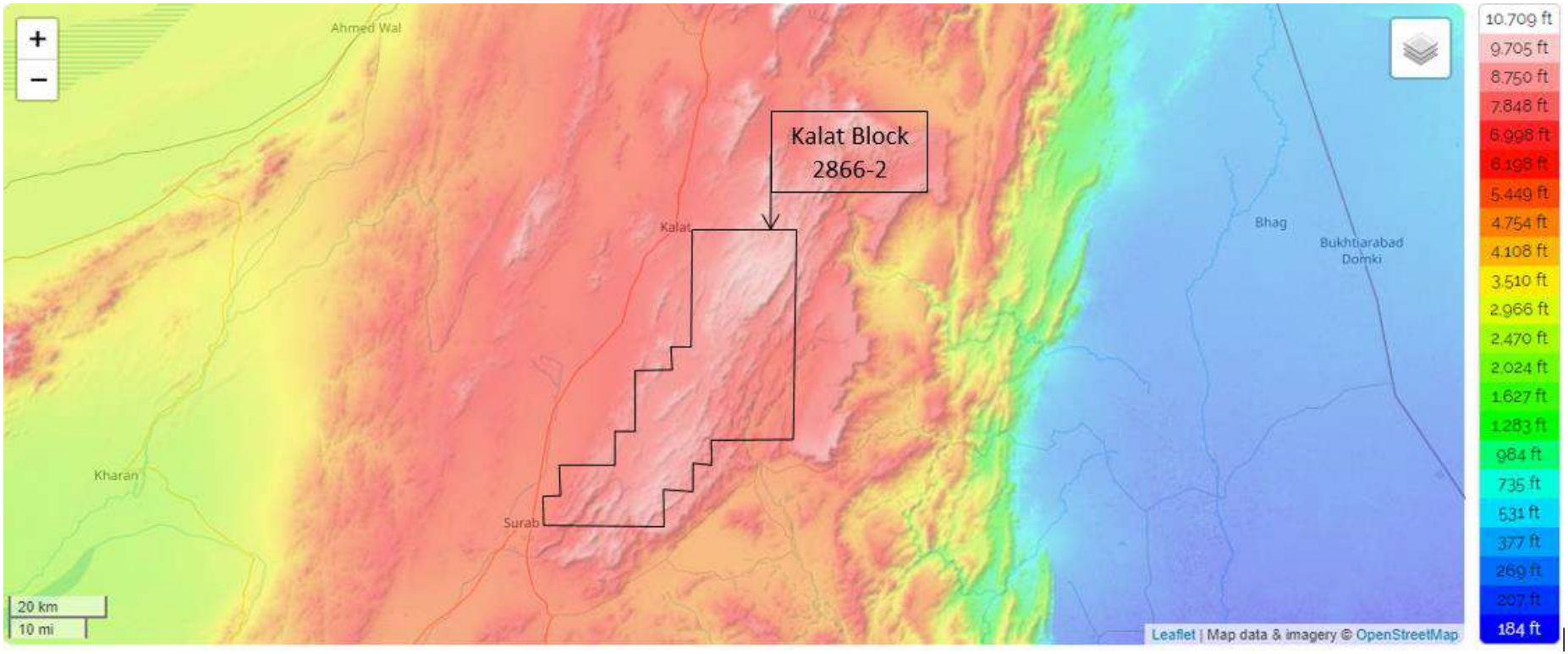

Figure 4.2: Topographic relief map of project area (Source:en-gb.topographic-map.com/maps)

4.2.3 Tectonic and Seismicity

The Indian subcontinent has been colliding with the Eurasian subcontinent over the last 30-40 million years. During this period, continental lithosphere longer than 2000 km has been shortened into the massive mountain ranges and elevated plateaus of central Asia (e.g., Molnar and Topponier, 1975; Bollinger et al., 2004). The earthquake activity as shown in map and second figure demonstrates how the earthquakes concentrate along the plate margins. Even though the Himalayan region is huge and contains large parts that are remote and sparsely populated we still have some overview of the seismicity there for the last 500 years, even with indications of an earthquake deficit at present (Ambraseys and Bilham, 2003; Bilham and Ambraseys, 2005; Feldl and Bilham, 2006). As a result of the continent-to-continent collision in the Himalayas, the highest mountains in the world have been created, still being uplifted more rapidly than any other mountain chain.

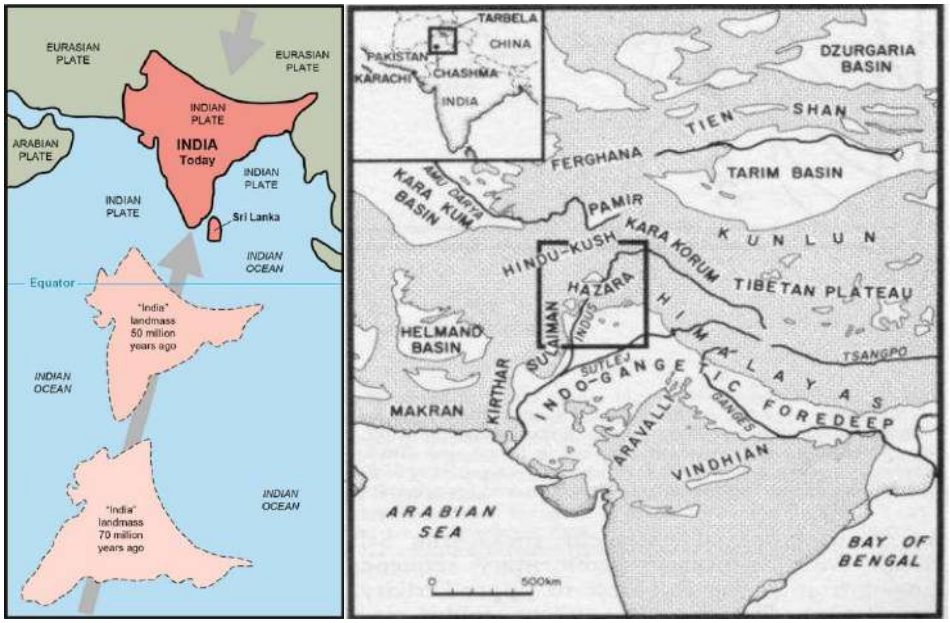

Figure 4.8: The Indian plate colliding with the Eurasian plate

Some of the greater mountain structures resulting from the collision can be summarized as follows:

- The Himalayas have been formed in the central part.
- The Arakan-Yoma Mountains of Burma.
- The Naga Hills of Assam towards the east.
- To the west, the Baluchistan arc manifested by the Kirthar and Sulaiman ranges delineate the continent-continent collision zone.
- The rising mountain ranges of the Tien-Shan Mountains in central Asia.
- The Karakoram Mountains in Pakistan.
- The Hindu Kush Mountains formed at the junction of the Baluchistan arc.
- The Karakorum Mountains and the Pamir ranges (Desio, 1965).

Figure 4.9 below shows the regional seismicity and the fault in the Arabian Sea which has generated earthquakes including the 1945 earthquake which generated a tsunami.

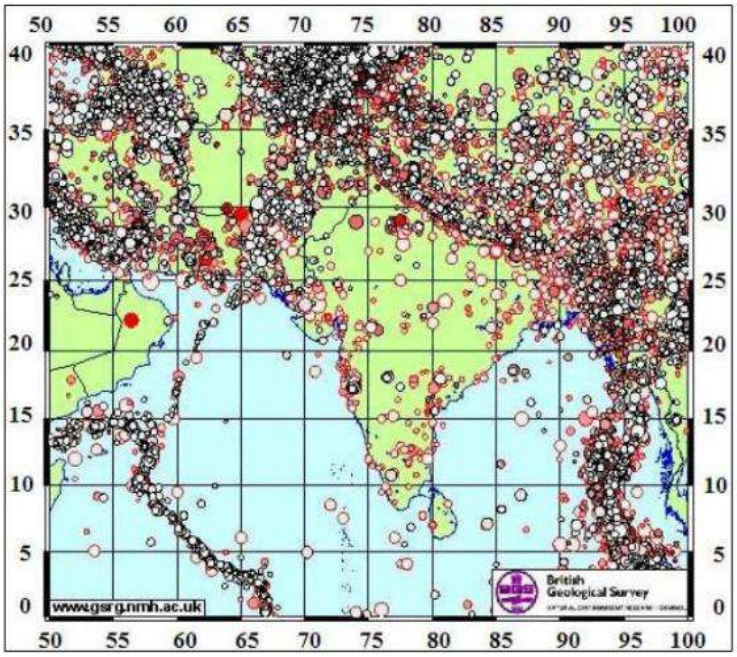

Figure 4.9: The regional seismicity of Southern Asia (above magnitude 3.0) according to the British Geological Survey (BGS)

Notably Hindu Kush, Pamir and Karakorum, are characterized by deep and concentrated seismicity through which significant seismic energy is released every year. Seismically, Hindu Kush and Pamir is one of the most active regions in the world (Nowroozi, 1971). The Himalayas and the Baluchistan Arc are the southernmost frontal parts of this collision zone which extends northward through Afghanistan and Tibet into China and Central Asia. The Chaman fault meets with the Herat fault and in the Pamir region these structures bend eastward and split into the Karakoram and the Altayan Tagh fault systems. The under thrusting of the Indian shield beneath the Himalayas and transverse ranges of the Balochistan arc was clearly recognized from fault plane solutions. (Molnar et al., 1973; Shirikovaa, 1974; Tandon and Shirokova, 1975). Left-lateral strike slip motion on the north-south striking Chaman fault has been postulated on the basis of geologic evidence (Wellman, 1966) and this is partly supported by the focal mechanism solution. The Sulaiman and the Khirthar ranges of Pakistan are aligned in a north-south direction forming the Balochistan Arc.

The NW-SE trending mountains of Kashmir, which form the western part of the Himalaya Arc, bend sharply to the south near Nanga Parbat (Meltzer et al., 2001) forming the western Himalayan syntaxis (often called the Hazara syntax). From there, the NE-SW trend of the Balochistan arc is generally maintained along the Sulaiman-Kirthar ranges for about 1000 km, before taking another sharp bend towards the west, after which a general east-west trend is maintained along the Makran ranges and the mountains of Southern Iran. The Makran ranges of Iran and Pakistan have been described as an active arc system by Farhoudi and Karig (1977).

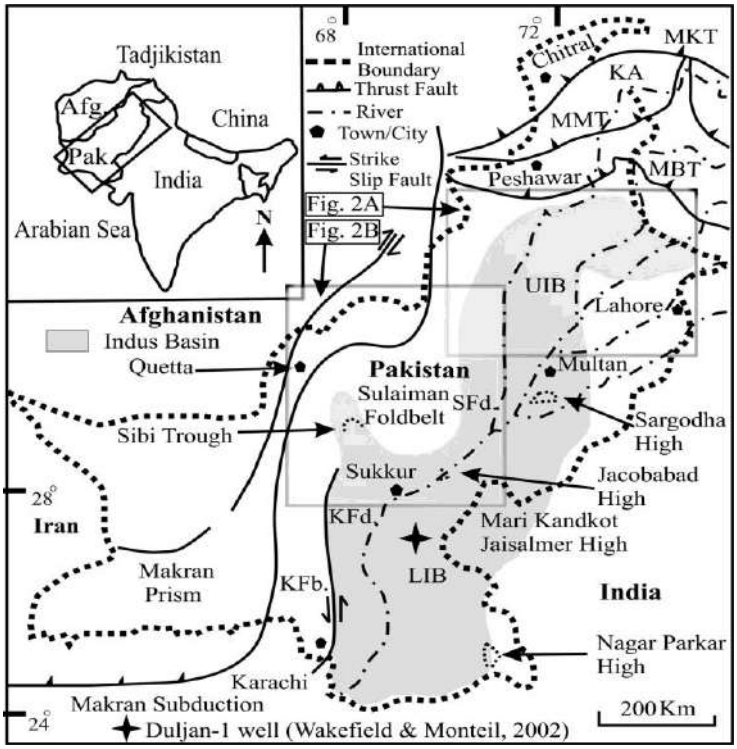

Figure 4.10: Major tectonics in Pakistan[7]

The structure of the Baluchistan arc, like the Himalaya arc, is dominated by tight folds and over thrusts, mainly from the north-west and west toward the Indian plate with axes directed essentially in a north-south direction, parallel to the general trend of the arc (William, 1976). At the southern end of the Sulaiman ranges, the mountains swing sharply towards the west, maintain an east-west trend for nearly 300 km, and then take a second sharp bend to the south near the city of Quetta surrounding the Sibi trough. The north-south trend continues along the Kirthar mountains (West, 1936). The Sulaiman and Kirthar mountains ranges are similar in geology, stratigraphy, and structure.

The structure of the area consists of a complex pattern of folds and thrusts with axes changing from east-west to north-south. The Chaman fault is a seismically moderately active fault. It starts from Hirat, Afghanistan, in the west and moves to east and causes the seismic activities in Pakistani area. It bypasses the angular configuration of the Quetta and Sulaiman ranges. It connects the Kirthar range from west of Quetta. The Chaman fault zone represents the western boundary of the wide deformation zone. While the northern part traverses Afghanistan the central part goes into Pakistan northwest of Quetta before it continues southwards towards the Arabian Sea. The district Kalat lies in the zone-3 in accordance seismic zoning map of Pakistan.

[7] Afzal, J et. al., Revised stratigraphy of the lower Cenozoic succession of the Greater Indus Basin in Pakistan, Journ. of Micropaleontology, 28, 7-23, 1 May 2009,

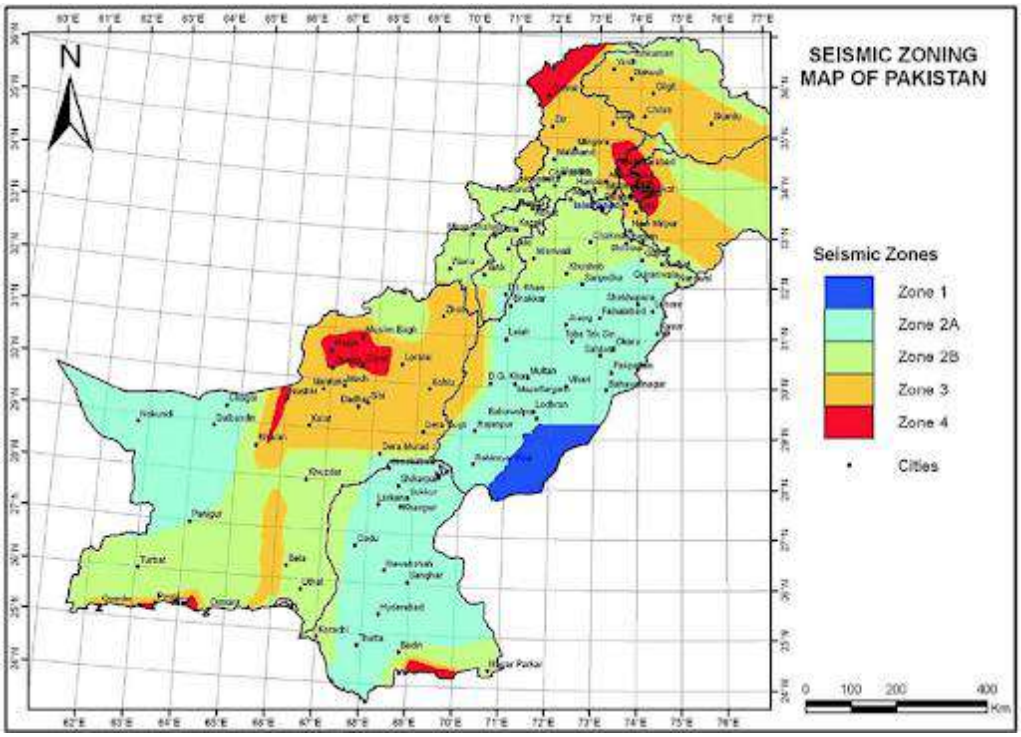

Figure 4.11: Seismic Zone of Pakistan

4.2.4 Soil

Balochistan is divided into four agro-ecological zones such as[8]

- Uplands
- Plains
- Deserts
- Coastal

Uplands consist of Subtropical continental highlands with dry temperate continental winter rains with cold winters and general winter and spring rains. Upland were grouped further in to sub-Zone.

The area above 5,000-8,000 feet like, Quetta, Pishin, Killa Abdullah, Killa Saifullah, Loralai, Muslim Bagh, Zhob, Musakhel, Kalat, Mastung, Toba Kakri, Toba Achakzai, Ziarat and Kan Mehtharzai or northern Balochistan were designated as sub-zone I. Sub-zone II comprised of southern areas of Khuzdar, part of Kharan, Wadh, Naal, Barkhan and Kholu.

The area of Kalat is approximately 13,851 sq.km. Average altitude is 2054 m. Soil of Kalat district is categorized as Loam. The soil of the district is fertile, both in irrigated and non-irrigated tracts. Among the non-irrigated tracts, the soil of Narmuk is the most fertile soil of the district. It may be regarded as a fairly uniform quality of soil. The best quality of soil is of reddish color and called malt or matmal. The second quality of soil, known as 'siahzamin', is a dark loam, generally found in the irrigated areas. Malt is best for the

[8] Agro-Ecological Zones/Crop Zoning of Balochistan by Directorate General of Agricultural Research Balochistan

cultivation of wheat. Other well-known but lesser quality soils are 'Karkat', 'Thathakhari', or 'Sani', yall or kher, korki and dagi.[9]

Aly Khan and Shahid Shaukat (2010) classify the soil of Kalat as Sandy-Loam. The pH of the soil was found to be 8.2. Maximum Water Holding Capacity of the soil was found to be 27.2%. Grass cover was regarded as medium. Species diversity was calculated to be 0.817. High densities of plant parasitic nematode species Meloidogyne incognita and Pratylenchus penetrans were found in soil in the rhizosphere of pomegranate[10].

4.2.5 Hydrology

The province consists of a plateau mostly comprised of hilly terrain. Balochistan has an annual rainfall of less than 250 mm on average and is thus a dry/arid region. Hence reliance on rainfall by Balochistan farmers for growing crops is low, which intensifies their search for a more reliable water source to secure irrigation to ensure high crop yields. Balochistan is characterized by a diversified climate which ranges from semi- to hyper-arid. Temperature regimes vary widely within the province, from cool temperate to tropical, with cold winters and mild summers in the northern uplands.

The only source of surface water all over Balochistan are non-perennial streams and rivers, which are known for their flash floods in rains and go dry for the rest of the year.

It is an arid area with scanty rainfall and significant variation both temporally and spatially. It varies from about 12 inches (300 mm) in the north to less than 3 inches (75 mm) in the south. Due to low rainfall the water resources are extremely scarce and the population has mostly settled along the hill torrents, nullahs and rivers which can provide water for drinking and agricultural needs.

The other source of surface water is Indus of which 8.49 MAF/year is available for Balochistan, under Indus Water Accord of 1991 between the four provinces. However, only 3.052 MAF/year is utilized due to non-availability of the infrastructure facilities like canals and head works. Thirteen river basins for surface and groundwater mentioned above are listed below with their respective basin areas.

Table 4.1: List of River Basin Area

1	Zohb River Basin	25,040
2	Nari River Basin	23,862
3	Pishin-Lora River Basin	17,216
4	Kacchi Plain Basin	34,284
5	Hamun-e-Lora	7,454
6	Hamun-e-Mashkbel	31,412
7	Mula River Basin	8,474
8	Gaj River Basin	6,001
9	Rakhshan River Basin	2,323

[9] District Development Profile Kalat by P&DD, Government of Balochistan in corporation with UNICEF

[10] An analysis of Phytonematode associated with pomegranate in Khuzdar and Kalat district, Balochistan by Aly Khan and S. Shahid Shaukat. Pakistan J. Agric. Res. Vol. 23 No. 3-4, 2010.

Table 4.1: List of River Basin Area		
10	Hingol River Basin	43,906
11	Dasht River Basin	27,146
12	Porali River Basin	25,079
13	Gwadar Ormara Basin	49,332
14	Miscellaneous	45,822
Total Area in Sq./km		**347,351**

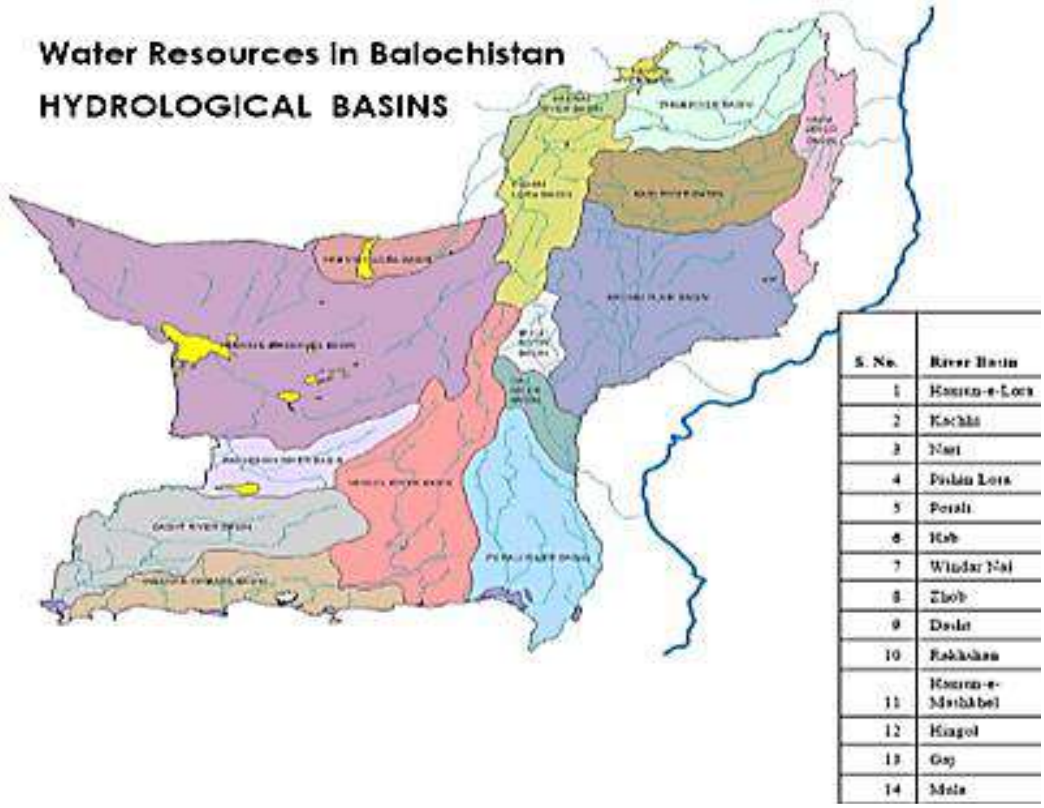

Figure 4.12: Water Resources in Balochistan
(Source: Rehabilitation of Water Sector in Balochistan, April 2005)

a) Ground Water

In Balochistan, groundwater extracted through dug wells, tube wells, springs and karezes, is the main source of water for irrigation of orchards and other cash crops besides domestic and industrial uses. However, the rainwater runoff and floodwater in small to large tributaries, streams and rivers play a major role in the development of groundwater resources and arid agriculture as well as control of desertification in the area. The province is the fruit basket of Pakistan. The fruits were cultivated 2 2 on an area of 660 km in 1992-93 which has increased up to 2,310 km in 2012-13 (MNFSR, 2014). The water required to raise these orchards is however, of the order of 1.920 billion cubic meter (BCM) and most of which is being met from groundwater. Because of favorable climatic conditions, improved communication network and introduction of electricity with subsidized flat rates after 1980s, there has been a tremendous increase in drilling of tube wells. The number of

tube wells that were about 5,000 in 1980 has increased to over 40,000 by 2015 (Figure 4.13). However, this development has also affected the sustainability of the groundwater resources[11].

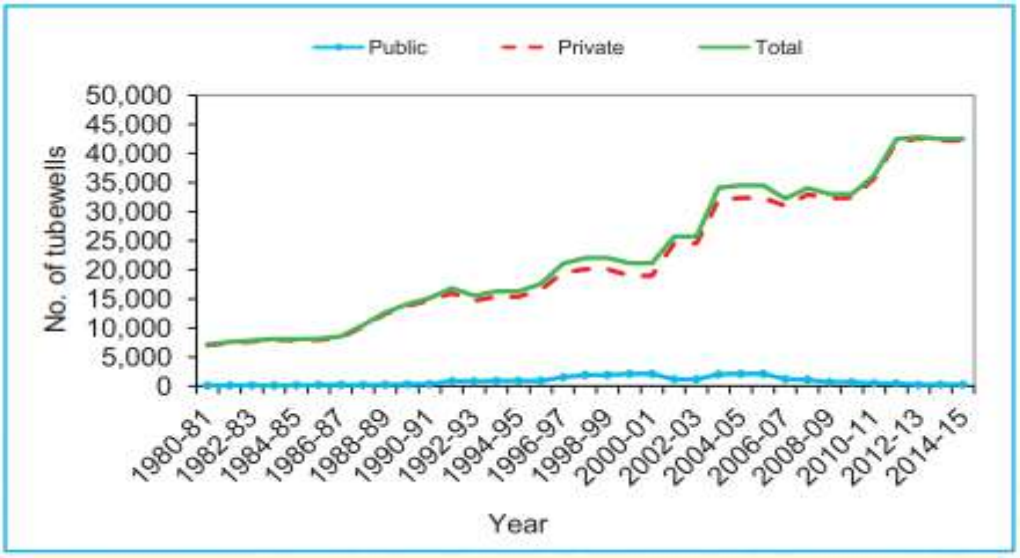

Figure 4.13: Increasing trend of tube wells in Balochistan[12]

b) Water Quality in Kalat

EMC had collected water samples during a field survey in the project area in year 2017. Results of those samples have been replicated here. Ground and surface water samples were collected and analyzed against the National Standards for Drinking Water Quality (NSDWQ). The test results are presented in table 4.2 and report is attached in annex. Locations of water samples are:

Sample	Latitude	Longitude
Spring 01 water	28°51'36.11"N	66°44'33.17"E
Spring 02 water	28°51'36.50"N	66°44'33.61"E
Village tap water	28°51'33.66"N	66°45'07.30"E

[11] Sustainable Groundwater Management in Balochistan, PCRWR Islamabad, 2017
[12] Sustainable Groundwater Management in Balochistan, PCRWR Islamabad, 2017

Table 4.2: Water Analysis Results

S.NO.	PARAMETERS TO BE ANALYZED	STANDARD	UNITS	RESULTS			TEST METHOD
		NSDWQ		Spring water 01	Spring water 02	Village Tap water	
1	pH value	6.5-8.5	SU	7.82	7.61	7.93	USEPA 150.1
2	Odor	Non objectionable/ Acceptable	Physical	Acceptable	Acceptable	Acceptable	Physical
3	Color	≤15	TCU	0.61	0.63	0.60	APHA-2020B/C
4	Turbidity	<5	NTU	1.1	0.9	1.3	APHA-2130B
5	Total Dissolved Solids(TDS)	<1000	mg/L	161	158	163	Hach 8160
6	Total Hardness(as $CaCO_3$)	<500	mg/L	90.3	86.1	89.4	Hach 8213
7	Fluoride(as F^-)	≤1.5	mg/L	0.62	0.58	0.61	USEPA 340.1
8	Chloride(as Cl^-)	<250	mg/L	40.2	38.1	41.1	Hach 8206
9	Nitrate(NO_3)	≤50	mg/L	2.40	1.97	2.41	Hach 8039
10	Nitrite(NO_2)	≤3	mg/L	0.007	0.005	0.007	Hach 8153
11	Cyanide (as CN-) total	<0.05	mg/L	BDL	BDL	BDL	Hach 8027
12	Phenolic compounds(as phenol)	-	mg/L	BDL	BDL	BDL	USEPA 420.1
13	Arsenic	<0.05	mg/L	BDL	BDL	BDL	APHA-3120B
14	Zinc	5.0	mg/L	0.12	0.8	0.16	USEPA3500Zn B
15	Manganese	<0.5	mg/L	BDL	BDL	BDL	Hach-8034
16	Barium	0.7	mg/L	BDL	BDL	BDL	Hach-8014
17	Sulphate (SO4-2)	600	mg/L	26	25	26	USEPA 375.4

4.2.6 Land Use

Total area of Baluchistan province is 347,190 sq.km. Constituting 44% of the total area of Pakistan. Only 31944.38 Sq. km is being cultivated due to is scarcity of water.

Agriculture

According to the Development statistics of Balochistan, 2016-17, in district Kalat a total area of 17,531 hectares is under cultivation. Karez and tube wells are utilized as source of water for irrigation.

Forestry

Harboi Juniper forest is located 10 km east of Kalat city. Harboi juniper forest is one of the rare and centuries' old forests in the world, stands at 9,000 feet above sea level, covering around 55,230 acres.[13]

Harboi forest is located at the north of the Kalat block and the notified boundary of Harboi forest is at distance of more than 30 km from the proposed Well locations.

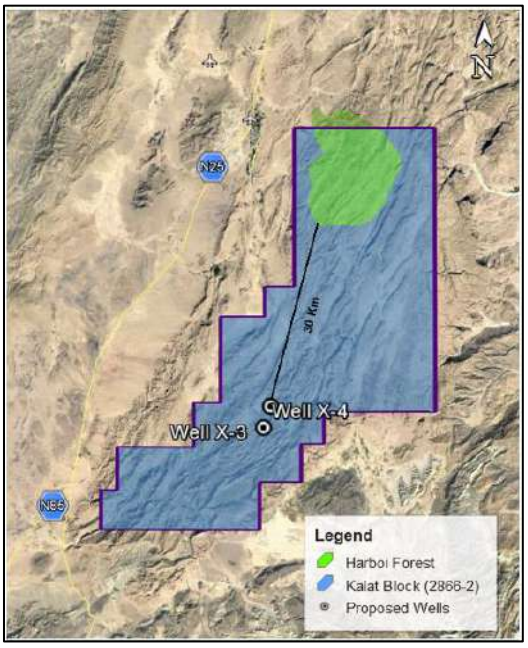

Figure 4.14: Location of Harboi forest and Well Sites.

4.3 Climate

4.3.1 Temperature

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Kalat. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

[13] Development statistics of Balochistan, 2016-17

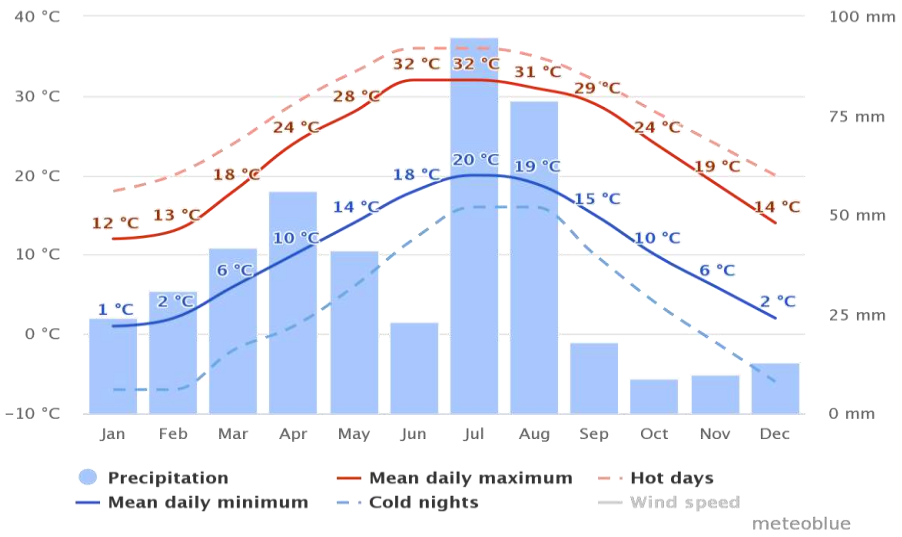

Figure 4.15: Monthly Minimum and Maximum temperature in District Kalat[14]

4.3.2 Precipitation

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

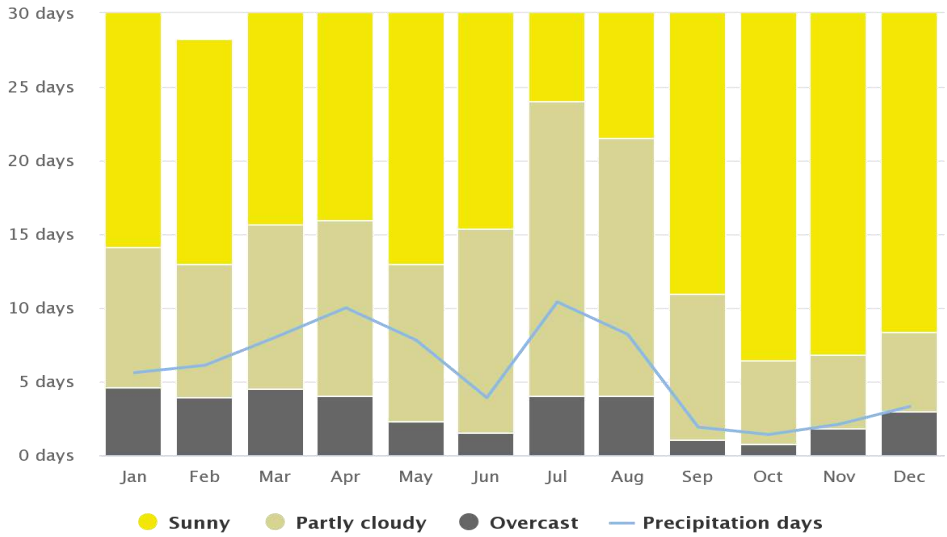

Figure 4.16: Average number of days of precipitation in a year in District Kalat[15]

4.3.3 Wind speed and Wind direction

The diagram for Kalat shows the days per month, during which the wind reaches a certain speed. The wind rose for Kalat shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE).

[14] www.meteoblue.com/en/weather/historyclimate/climatemodelled/kalat_pakistan_1175296
[15] ibid

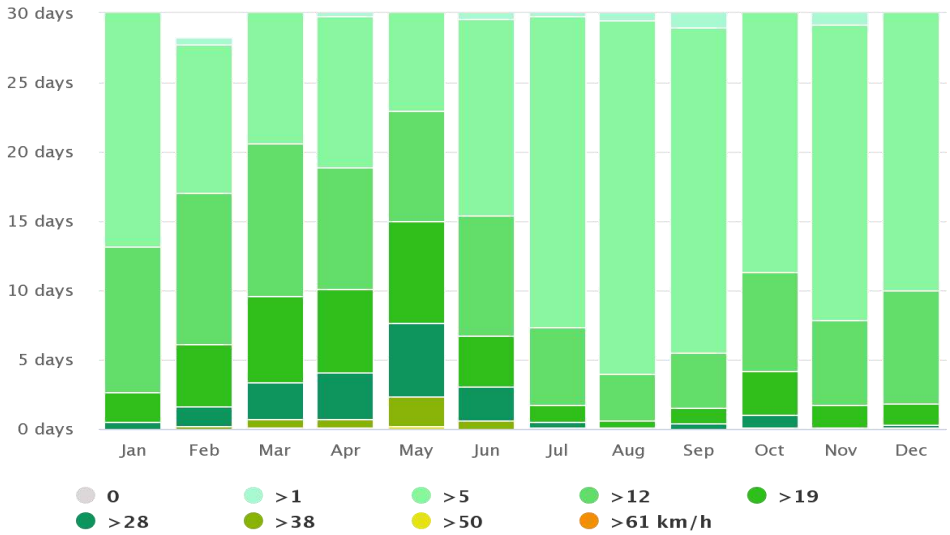

Figure 4.17: Average Wind Speed in district Kalat[16]

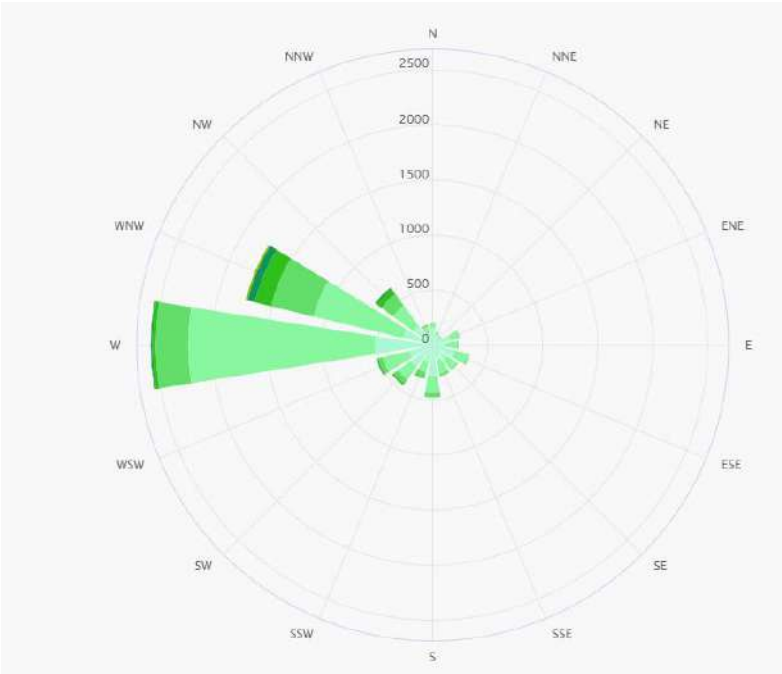

Figure 4.18: Wind direction[17]

4.3.4 Ambient Air & Noise Quality

No primary ambient air quality and noise level data of the project area is available due to inaccessibility. However, secondary sources suggest air quality in the project area appears good based on the fact that the it is situated at substantial elevation; human population is very small and more than 500 feet below the project location. The population is entirely rural and domestic, air pollutant, such as emissions from wood and kerosene burning stoves

[16] ibid
[17] ibid

in some households gets completely dissipated. There are no other industrial pollution sources at present in the vicinity.

Similarly, noise level is also very low due to rural setting and sparse population, there is no source of continuous high level noise.

4.4 Ecological Environment

The climate of Baluchistan province is arid to semi-arid with annual rainfall ranging from 50 mm in the west to over 400 mm in the east. Precipitation distribution is very erratic and most of the rainfall is received in winter season. The temperatures are also very variable. In Sibi region it reaches 50°C in summer and in Kalat it falls up to 10°C in winter.

The total geographical area of Baluchistan is 34.73 mil ha of which 93% area is classified as rangeland (grazing land). About 80% of total area is classified as inter-mountainous and remaining 20% consists of flood plains and alluvial deposits.

Since the main land use in the province is grazing, geo-morphologically rangelands in Baluchistan have been distributed into six types of landscapes viz. Mountains, Uplands, Piedmont, Desert, Flood plain and Coastal plain.

From vegetation point of view, the rangelands of Baluchistan can be divided primarily in to following three main categories:

1. Central Baluchistan Range
2. Western Baluchistan Range
3. Eastern Baluchistan Range

The Kalat district is situated in the central Balochistan range also referred as central Brahui range. Central Brahui Range, southern offshoot of the Himalayas, lying in the center of the Balochistan plateau, Pakistan. It extends southward for about 225 miles (360 km) from the Pishin Lora and Zhob rivers to the Mula River. The range is a series of parallel limestone ridges covered with juniper forests and hemming in narrow valleys, and its trend is north-south between Mula and Quetta but turns sharply east-southeast just north of Quetta to meet the Sulaiman Range. Summits generally exceed (1,800 m) and gradually decline toward the south; the highest peaks are Khalifat (3,487 m) and Zarghun (3,578 m) north of Quetta. The Bolan, Harnai, and Mula are the principal passes.

Kalat District is one of the coldest areas in Pakistan. The climate of the district is dry in summer and severely cold in the winter. Heavy snowfall is experienced in the city, owing to its higher elevation. Spring is the most pleasant time in the area. Autumn season remains mild during day and becomes cold at night.

a) Flora

Major tree species found in the district are Obusht (Juniperus excelsa polycarpos), Wild Ash (Fraxinus xanthoxyloides) and Shina (Pistacia khinjjak), which occupy favorable sites. The main shrubs are Janglee Badaam (Prunus spp), Lunicera quinquelocularis, Lunicera hypoleuca, Abelia triflora, Berberis vulgaris, Rosa beggeriana, Sparae (Cotoneaster

nummularia), Tharkha (Artemisia maritime), Crataegus spp., Kala Zira (Carum bulbocastanum), Oman Ephedra nebrodensis and Ephedra intermedia), Makhi (Caragana ambigua), Khakshir (Sisymbrium sophia), Zralg (Berberis lyceum) and Surae (Rosa spp.) The ground cover is constituted mainly by (Stipa himalacia), (Dichanthium annulatum), (Chrysopogon aucheri), pennesitum orientale, pennesitumflaccidum, Stipa capillata, Stipa cabulica, Leptorhabdos benthamiana, and (Cymbopogon spp.). From the above mentioned flora, Kala Zira (Carum bulbocastanum) is used as spice and fetches high value in the market. In addition, Oman (Ephedra nebrodensis) and Khakshir (Sisymbrium sophia) are found in large quantity and have medicinal value. A large amount of these herbs is marketed. Extracts of these plants are largely used by villagers as well for the treatment of cough and asthma which they believe has no side effect. Moreover, these are easily available either free or at a nominal price. Vegetation zones of the district mainly consist of the following categories:

Table 4.3: Vegetation found in district Kalat

Vegetation zone	Brief description
Uphill steep rocky cliffs	Like Harboi hills, in the east of Kalat town where Juniperus Excelsa polycarpos is the predominantly climax Species associated with Pistacia khinjjak, Ephedra nebrodensis, Ephedra intermedia, Berberis lyceum, Lunicera spp; Cotoneaster nummularia; Rosa lacerans and Fraxinus xanthoxyloides.
Foot hills	It comprises mostly of the fertile deep soil plateaus like Dashte -e-Baddo, Gayawan. It provides summer grazing land for both local and nomadic grazers and is dominated by a variety of shrubs like Artimesia meritima (Tharkha) , Prunus ebernea (Wild almond), Caragana ambigua (Makhi), Berberis lyceum (Zralg), Thymus serpfllum,Pennisetum orientale, Dichanthium spp. and Sophora grifithii (Ghuzaira) along with herbs and other grasses.
Piedmont plains	Mostly modified by the local community for agriculture and other land uses. It consists of more or less flat to undulating plains. The wasteland contains mostly Artimesia meritima (Tharkha), Haloxylon grifithii, Harmal (Peganum harmala), with sporadic mixture of edible seasonal forage plants which may include (Stipa himalacia), (Dichanthium annulatum), (Chrysopogon aucheri), pennesitum orientale, pennesitum flaccidum, Stipa capillata, Stipa cabulica, Leptorhabdos benthamiana, and (Cymbopogon spp.); thus supporting thousands of animals, both local and nomadic ones
Dry stream beds	Commonly found in the entire district where Tamarix Spp. is commonly seen.

Source: Kalat District Development profile, Planning & Development Department, Government of Balochistan in Collaboration with UNICEF, 2011

b) Fauna

Wildlife habitat type is Dry Steppe. There are no historical bench marks to determine the status of wildlife in the area. However, according to local community, the number of wildlife species has alarmingly declined as a result of indiscriminate hunting of animals for fun and meat. Overall global climatic change has also led to an unfriendly environment for the animals to survive with. Among key species are:

Table 4.4: List of wildlife species	
Wildlife type	**Common specie**
Mammal	Leopard (Panthra pardus), Wolf (Canis lupus), Hill fox (Vulpes vulpes grifithii), Asiatic Jackal (Canis aureus), Stripped Hyaena (Hyaena hyaena) Cape hare (Lepus capensis), Porcupine (Hystrix indica), Afghan Hedgehog (Hemiechinus auritus megalotis), Afghan Pica (Ochotona rufescens) and Stone Marten (martes foina) etc..
Birds	Chukar (Alectoris chukar), See see partridge (Ammoperdix griseogularis), Kestrel (Falco tinnunculus), Magpie (Pica pica), Golden eagle (Aquila chrysaetos daphanea), a number of Finches, Buntings, seasonal/migratory Waterfowls, Hawks, Bustards and Sand grouse etc
Reptiles	Afghan Tortoise (Agrionemys horsfieldii), Afghan Agama (Trapelus megalonyx), Indian Cobra (Naja naja naja), Saw-scale viper (Echis carinatus), Dwarf Dark-headed racer (Eirenis persica walteri) Levantine viper (Macrovipera lebetina) etc.
***Source**: Kalat District Development profile; Planning & Development Department, Government of Balochistan in Collaboration with UNICEF, 2011*	

c) Rangelands

The type of rangeland present in the district is classified as Central Balochistan Ranges. It has species like: Gung*Vitex agnuscastus)*, Ghureza (*Sophora lopcuroides*), Tharkha (*Artemisia maritime*), Zawal (*Achillea santolina*), Zoz (*Alhagi camalorum*), Spanda (*Peganum harmala*), Washta (*Stipa pennata)*, Weezh (Pennisetum orientale), Sargarai (*Cymbopogon jawarancusa*), Margha (*Pennisetum annulatum*) etc. The productivity is adequate with average productive capacity of 160 kg /hectares. The rangelands have been degraded due to overgrazing and fuel wood collection and the only remnants are less palatable and poisonous plants like Ghuzera (*Sophora grifithii*). The degradation has been aggravated by the.[18]

d) Protected area/Notified forests

Harboi forest is a notified forest in the Kalat Block. It is a protected Juniper forest spread on an area of 22,351 hectares in tehsil Kalat, district Kalat. Although, a large part of Harboi forest lies inside the Kalat Block, it is at least 30 km away in the north from the Well. Therefore, the Harboi forest are not threatened by the drilling activity.

4.5 Socio- Economic Environment

This section describes the key socio-economic and cultural features of the Micro environment of the project area i.e. district Kalat and Macro environment of the project area i.e. Balochistan province.

Various social aspects including the history, administrative set-up, demography, infrastructure facilities, education, health, water supply and road network, cultural heritage, economic scenario etc. are described in subsequent sections.

[18] ibid

4.5.1 Geography and Administrative Division

District Kalat is situated at the central Balochistan sharing boundaries with Mastung in the North, Kachhi in the East-Northeast, Khuzdar in the South-Southeast, Washuk in the south-southwest and Kharan in the West.

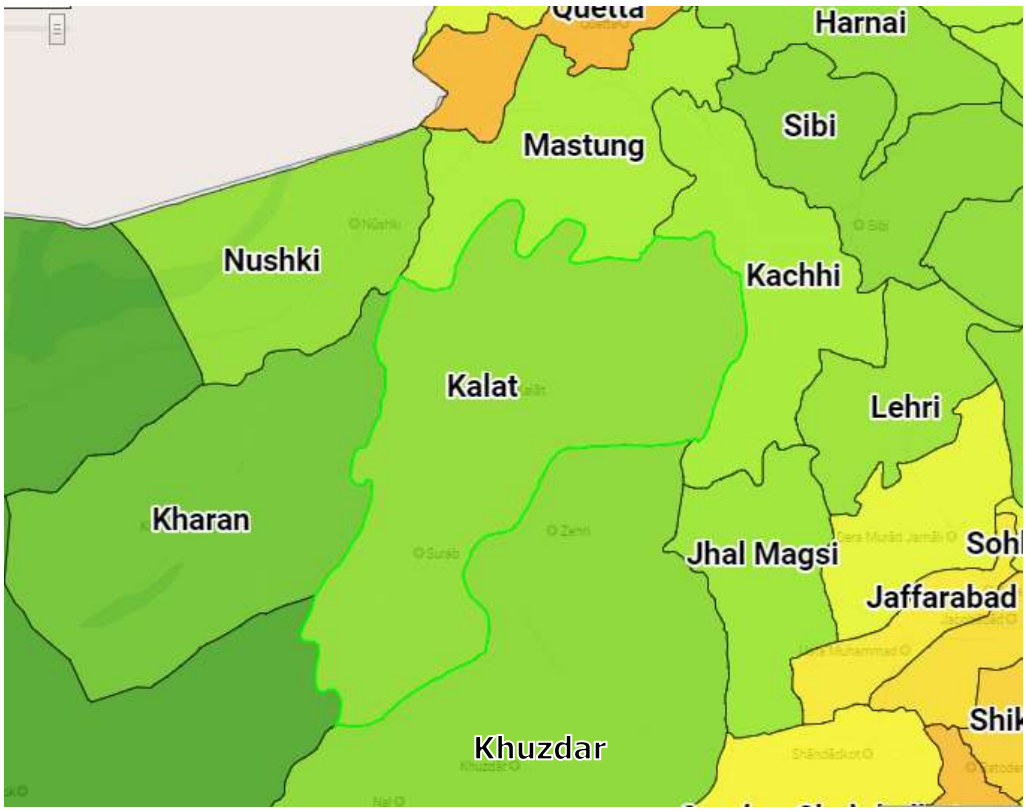

Figure 4.19: District Kalat location map

District Kalat has an area of 13,851 square kilometers and consists of 03 Tehsils viz. Kalat, Surab and Manguchar and 02 sub Tehsil viz. Gazg and Johan and 29 Union Councils[19].

Table 4.5: Administrative division of district Kalat			
Tehsil	**Sub Tehsil**	**Union Councils**	**Mouzas**
3	2	29	622

4.5.2 Demography and Population

District Kalat population consist of 412,232 people (211,695 males and 200,536 females). The overall male to female ratio is 106 indicating approximately 106 males for 100 females. Proportionally 51.35 percent are male while 48.65 percent are female. Similarly, in district

[19] Pakistan Bureau of Statistics

More detailed analysis of the population of the district is represented below:

Table 4.6: Population of district Kalat, 2017 census

Admin. Units	House-holds	Population – 2017				Gender Ratio
		Male	Female	Trans-gender	Total	
Kalat	55,497	211,695	200,536	01	412,232	106
Rural	45654	175,406	164,367	01	339,774	107
Urban	9843	36,289	36,169	0	72,458	100

4.5.3 Tribes, Ethnic Groups and Languages[20]

The main tribes in district Kalat are Mirwani, Dehwar, Mengal, Pandrani, Mohammad Hasni, Shahwani, Bangulzai, Lehri and Langau. Majority of population in the district speaks Brahvi followed by Balochi.

4.5.4 Religious Beliefs[21]

In district Kalat Majority of the people are Sunni Muslims. They are regular in their prayers and fasting during the month of Ramzan. Religious leaders (Mullahs) are the most influential people in rural areas, however, their popularity diminishes in urban areas. The main festivals are Eid-ul-Fitar and Eid-ul-Azha, which Muslims celebrate with a lot of fervor. The other important religious days are Shab-e-Barat and Eid-e-Milad. The Hindu people also celebrate their festivals like Diwali and Holi, besides a fun fair in the Kali Devi's temple, which is a famous worship place for Hindus is located in the city of Kalat, is arranged yearly. They visit the temples regularly. All the religious sects are on very close terms with each other and cooperate in their social and religious life.

4.5.5 Agriculture

District Kalat has two cropping seasons:

1. Rabi Crops: Rabi crops include; Wheat, Barley, Cumin, Lentil (Masoor), Vegetables, Fodder and Sunflower. These crops are sown in winter or during early summer and harvested in late summer.

2. Kharif Crops: Kharif crops include; Mungbean, Mashbean, fruits, Onion, Potato, Vegetables, Melons, Chilies, Fodder and Coriander. All these crops are cash crops and they are sown in the summer and harvested in the late summer or early winter.[22]

Table 4.7: Production of major crops in district Kalat

S No.	Crop	Production	S No.	Crop	Production
		Kalat			Kalat
1	**Wheat**	10364	**7**	**Grape**	1,356
2	**Barley**	624	**8**	**Peach**	1,645
3	**Onion**	58,887	**9**	**Pomegranate**	652

[20] District Dev. profile; Planning & Development Deptt., Govt. of Balochistan in Collaboration with UNICEF, 2011 (Kalat & Khuzdar)
[21] ibid
[22] ibid

Table 4.7: Production of major crops in district Kalat

S No.	Crop	Production	S No.	Crop	Production
		Kalat			Kalat
4	**Potato**	4341	**10**	**Plum**	9,544
5	**Apple**	23,715	**11**	**Cherry**	586
6	**Apricot**	2,791			

Source: *Development Statistics of Balochistan 2016-17*

Table 4.8: Cultivated area by district (hectares)

District	Geographical Area	Reported Area	Cultivated Area	Un-Cultivated Area		
				Cultivable Waste	Forest	N/A for Cultivation
Kalat	662,200	631,452	113,470	26,017	64,367	427,598

Source: *Development Statistics Balochistan, 2016-17*

4.5.6 Irrigation

In district Kalat, tube-wells and Karez are the two main sources of irrigation Majority of the crop cultivation area (17,499 Hectares) is irrigated by means of tube wells of the total irrigation sources followed by Karez which covers (32 Hectares) of the total irrigation sources in District Kalat. There is no canal system available for crop irrigation.

Table 4.9: Area irrigated by different sources of irrigation & no. of wells and tube-wells in district Kalat in 2016-17

Total area (hectares)	Area irrigated by canal (hectares)			Area irrigated (hectares)		Karez/ spring/ other	Total	
	Govt.	Private	Total	Well	Tube well		Well	Tube well
17,531	-	-	-	-	17,499	32	-	3684

Sources: *Development Stats. of Balochistan 2016-17. Directorate of Crops Reporting Services, Balochistan*

4.5.7 Livestock

Livestock in District Kalat include Cow, sheep, goat, camel and poultry. Livestock rearing is an important source of income for the natives. Milk, Wool, Hide, Meat and Skin etc. are obtained from the livestock which is used for personal purpose as well as sold to generate income.

Table 4.10: Projected Population of Livestock and Domestic Poultry, 2016

Cattle	Buffalo	Sheep	Goat	Camels
65,708	1,668	1,507,794	1,042,766	12,110
Horse	**Mule**	**Asses**	**Total**	**Poultry**
809	436	29,104	2,660,395	439,082

4.5.8 Educational institutes

According to official statistics collected through Balochistan Education Management Information System (BEMIS) Report 2016-2017, number of schools, colleges, student enrollment, adult literacy rate and student teacher ratio in district Kalat are as follows:

Table 4.11: Government Schools							
District	Total	Primary		Middle		High/H. Secondary	
		Boys	Girls	Boys	Girls	Boys	Girls
Kalat	594	322	158	34	27	37	16
Source: *Balochistan Education Management Information System (BEMIS) Report 2016-2017*							

Number of colleges in district Kalat are as follows;

Table 4.12: No. of Government Colleges							
District	Degree colleges			Inter colleges			Total colleges
	Boys	Girls	Total	Boys	Girls	Total	
Kalat	1	0	1	2	2	4	5
Source*: Balochistan Education Management Information System (BEMIS) Report 2016-2017*							

Enrollment in schools in district Kalat are as below:

Table 4.13: Enrolment in Schools						
District	Total	Kachhi	Primary	Middle	High	H. Secondary
Kalat	32,124	6,530	20,031	3,799	1,764	-
Source*: Balochistan Education Management Information System (BEMIS) Report 2016-2017*						

Adult literacy rate of the district Kalat is mentioned below:

Table 4.14: Adult literacy rate (15 year and above)			
District	Male (%)	Female (%)	Total (%)
Kalat	54	38	47
Source*: PSLM 2014-15*			

Student to teacher ratio in schools in district Kalat are as follows:

Table 4.12: Student Teacher Ratio by level and gender								
Overall district	By Gender		Student Teacher ratio (STR)					
			Primary		Middle		High/Higher sec.	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
20.4	19.8	21.5	26.9	28.5	17.4	15.9	15.7	19.7
Source*: Balochistan Education Management Information System (BEMIS) Report 2016-17*								

4.5.9 Healthcare facility

The breakup of Health services in the district Kalat are as under:

Table 4.16: Government and Private Health Facilities						
Districts	Hospital	Dispensary	RHC	BHU	MCH	TB Clinic
Kalat	2	42	3	16	4	1
Source*: Development Statistics, Balochistan, 2016-17*						

Number of doctors and paramedical staff available in the district are as follows:

Table 4.17: Doctors and paramedical staff						
Doctors	Nurses	Dental Surgeons	Pharmacist	Drug Inspector	LHV	Dias/Mid wives
44	9	5	13	1	23	80
Source*: Development Statistics, Balochistan, 2016-17, Health Directorate Balochistan,*						

4.5.10 Water Supply

According to the PSLM survey 2014-15, 36% of household in district Kalat have access to Tap water source. Table 4.17 gives the details of sources of drinking water available to the people of district Kalat.

Table 4.18: Source of drinking water (Percentage %)

	Tap water	Hand pump	Motor Pump	Dug well (%)	Others
Dist. Kalat	36	0	42	10	13
Urban	100	0	0	0	0
Rural	21	0	52	12	16

***Source**: PSLM 2014-15*

4.5.11 Road Network Infrastructure

Table 4.19: District wise Roads in District Kalat (Km)

District	Black Topped	Shingle	Total
Kalat	926	1,286	2,212

***Source**: Development Statistics Balochistan (2016-17)*

The total length of roads in district Kalat is 2,212 km, out of which, 926 km is black topped road (metaled road). Major portion of the total roads comprises of shingle roads. Most of the villages and towns are interconnected through shingle roads.

5.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 Introduction

This section discusses the potential environmental and socioeconomic impacts that would emerge as a result of various activities of well drilling such as drilling, construction of campsites and access tracks, facility component maintenance or replacement, waste management (e.g. produced water and solid waste); and restoration of sites after completion of drilling activities in the Kalat Block (2866-2), Balochistan and suggests appropriate mitigation measures in order to reduce, overcome or compensate negative impacts associated with the project.

The likely impacts of the proposed activities on the geomorphology[23] of the area, its water (surface & ground), air quality, ecological resources (flora & fauna), noise level, and socio-cultural environment that may affect employment, agricultural land, health, provision of basic amenities & utilities and safety issues etc. have been described in the following sub-sections.

5.2 Methodology

The potential environmental and socioeconomic impacts related to the proposed project have been identified through literature review, scrutinizing baseline data both primary and secondary, professional opinions, experience, understanding of the proposed drilling and field observations. The risks then identified have been addressed by recommendations of various mitigation measures to reduce the severity of each impact.

The evaluation of environmental and socioeconomic impacts of the proposed project activities have been made by using strict rating and by judgment based on experience and professionalism.

5.3 Physical Environment

5.3.1 Changes in Landscape and Soil Erosion

a. Potential Sources of impacts

The potential sources of soil erosion due to the potential project activities include clearing of land for preparation of camp sites for drilling operations, construction of access tracks for well sites, construction of well sites, quarrying of gravel or sand, use of project road, off road travel and development of new access tracks.

b. Impact Assessment

Soil erosion can be defined as the rate of soil loss from an area above that occurring under natural conditions. It is a two phase process consisting of the detachment of individual

[23] *It is the scientific study of the origin and evolution of topographic and bathymetric features created by physical or chemical processes operating at or near Earth's surface*

particles from the soil mass and their transport by erosive agents such wind and water (Morgan, 1988). In the context of soil erosion due to anthropogenic activities, the detachment part may occur due to various activities such as cropping, livestock grazing or similar activities due to which soil or the land scape of an area is disturbed from its natural state. Construction of tracks or other facilities has also been historically perceived and is some cases has actually led to soil erosion. The proposed project activities for drilling involve construction/improvement of track and other facilities.

The possibility of soil erosion from human activity increases when soil particles are detached from the soil mass. This is true for lands where drilling related activities are conducted where a certain landscape is changed and the area is left exposed to wind and water erosion and also for dirt tracks which are developed through continual use by vehicle and soil surface is subject to continual erosion for as long as the track is used. However, the case is different when the soil surface initially disturbed is sealed or compacted by engineering means. For example, metaled roads are not subject to soil erosion similarly neither would the gravel-topped tracks proposed for the well sites, which will be compacted to sustain loads up to 45 tons.

Land use impacts are linked with land disturbance, habitat destruction, and soil erosion due to proposed project activities include preparation of camp sites for drilling operations, construction of access road for well site, construction of well site, quarrying of gravel or sand, use of project access road, off road travel and development of new access tracks. Many impacts can be reduced or avoided when considered during siting and design of the project. Compared to the total available grazing area, the uptake by the project will not be significant and will not have any significant affect.

Construction of access road

A gravel top access track will be prepared to access the well sites (where required) and existing black top road network will be used as much as possible. Construction of the access road in the flat area will not involve any major cutting and filling. Since the entire access road will be topped with compacted gravel, the chances of soil erosion will be reduced. The topping can be done with in-situ or imported gravel. Mitigation measures to minimize chances of soil erosion or land slippage during the entire length of the road have been recommended at the end of this section. This will primarily be due to wind erosion from earth-fill stockpiles and loose road surface during construction.

During development of Drilling Site

The existing land and land use pattern of the project area surrounding will get affected from the construction of drilling site and associated activities, like leveling of land, installation of rig & machineries, temporary storage of domestic waste and other kind of waste material etc. These impacts may happen in terms of temporary clearing land (as this much area is required for well drilling), changes in the aesthetic looks of the area, changes in soil characteristics from temporary dumping of the earth and fill material required for site elevation etc.

During Well Drilling

The entire drilling operation, being a temporary activity, will not require any kind of land acquisition (as it involves temporary leasing of land) and neither involves clearing of any trees and vegetation. The drilling activity would require a land of around 600 ft. x 600 ft., which involves cleaning of undergrowth for movement of truck loaded with drilling rig and associated machineries and crews. During the entire drilling operations, drill cuttings and domestic waste and sewage from labor camps etc. may cause soil contamination. The road area within the village land may get affected from heavy vehicular movement, as the regular movement of approximately 20-25 truckloads will be there during drilling operation phase. The truck movement is not likely to cause traffic congestion in the village level road as well as in the nearby roads since the microenvironment is sparsely populated and entirely rural in nature.

Most land use impacts that occur during the drilling/development phase would continue throughout the life of the oil and gas field. Overall, land use impacts could range from minimal to significant depending upon both the areal extent of the oil and gas field, the density of wells and other ancillary facilities, and the compatibility of the oil and gas field with the existing land uses.

Quarrying of sand and gravel

Limited volumes of gravel or sand will be quarried from the project area. because potential for soil erosion exists if quarrying is done by excavating along or across unstable slopes. Quarries should be selected after approval from Independent Monitoring of project assessing site conditions that there will be no possibility of soil erosion or changes in landscape due to quarrying of gravel or sand from the location.

Road Travel during project

The use of the track during the project may result in erosion of soil from the track surface. In arid environment this form of erosion is quite common but is more pronounced on dirt tracks. On gravel-topped tracks, erosion is less significant due to the compacted gravel topping. During the project, erosion from track surface will be minimized by sprinkling of water over the project access track and compacting loose surface wherever required. However, as water is a precious resource in the area there will have to be some rationing of its use.

Off road Travel and Development of new tracks

In drilling operations, off road travel is minimal as activities are not scattered and only one access track suffices during the project

c. Cumulative Impacts

Soil erosion, if occurs, from each project activity can accumulate spatially as well as temporally. Relatively speaking, the clearing of land and is the only potentially significant

source of soil erosion and cumulative impact of the project activities will not be significantly different from those assessed individually.

d. Mitigation Measures

- Total land uptake by the camps, and access road will be kept to the minimum required.
- During construction, movement of construction equipment will be restricted to work areas only to avoid unnecessary disturbance to soils in the project area.
- Access tracks (other than the main access track for the project) to be used by water tankers, dumper trucks and other vehicles shall be monitored by the IMC or PPL HSE Dept.
- Stream crossings, when built, shall be such that the slopes of the stream bank are properly adjusted and compacted resulting in a stabilized and sealed surface.
- Photographs will be taken at intervals throughout the project activities to monitor any changes in soil and its conditions.
- Good engineering practices will be adopted during construction activities to ensure that unnecessary clearing of vegetation and disturbance to soils outside work areas are avoided
- Where improvement of existing tracks or development of short lengths of new tracks is unavoidable the width of the access track will not exceed 4m.
- Well site and campsite areas will be kept to a minimum.
- The construction of well site and campsites in leveled areas to minimize disturbance to soils and landscape shall be ensured.
- The access track shall be properly compacted at the time of construction and thereafter properly maintained by watering and compaction (where required) throughout the entire construction and drilling operation.
- Areas along the access track, well site and campsite shall be visually monitored and any area showing signs of soil erosion shall be watered and compacted.
- During construction phase, a single track shall be identified and approved along sections of the main track on which work is in progress. Vehicles shall be allowed to travel only on the approved track.
- During construction stage, dumping of gravel on or close to the access track being improved or constructed shall not be allowed.

e. Residual Impacts

The characteristics of residual impacts of the project activities are tabulated below.

Characteristics	Impact
Duration	Medium
Extent	Local

Likelihood	Possible
Consequence	Minor
Reversibility	Reversible
Significance	Low medium

5.3.2 Soil and Water Contamination from Spills

a. Potential sources of impacts

Domestic wastes

Domestic wastes generated during drilling will include sewage, grey water (from kitchen, laundry and showers), kitchen wastes, combustible wastes and recyclable wastes. Sewage will be treated and disposed of by means of a septic tank and soak pit. Grey water will also be collected in soak pits. Soak pits will be designed to accommodate wastewater generated during total duration of the operation. In case the soak pits get filled during operation, grey water will be sprinkled over access tracks. Sprinkling of grey water will be done in such a manner that the ponding of water is avoided. The water sprinkled will evaporate with time and will not contain any contaminant at level that may be harmful to either soil or water. In case soak pits cannot be built large enough due to high water table, additional pits may be built in a nearby area where water table is low.

Combustible material will be handed over to certified waste contractor for appropriate disposal. All kind of food wastes will be disposed of properly.

Medical wastes

Medical Waste will be segregated from other wastes, stored separately and will be sent to the nearest incineration facility. No impacts will occur if this method of disposal is followed.

Recyclable and reusable wastes

Recyclable and reusable wastes will include glass, metals etc. These wastes will be sent to a certified waste contractor, in order to ensure the wastes are recycled or reused properly, without having any effect on the environment.

Oil Stains and spills

Fuel or oil stains, leakage or spill during exploration activities can result in contamination of soil and water. From a management perspective these have been categorized as minor, moderate or major and detailed below along with the recommended mitigation measures.

- **Minor Spills:** Leaks from vehicles, equipment, or storage containers at campsites or work areas outside the campsite or oil or fuel stains produced during handling and transfer operations such that the area and depth of soil contaminated is less than 1 square meter and 0.3 m respectively.
- **Moderate Spills:** Oil spills during transfer or handling operations resulting in spillage of no more than 200 liters of fuel or oil.

- **Major Spills:** These may occur during transportation of oil to the camp sites or failure of the oil containment arrangement at the camp sites resulting in spillage of oil significantly more than 200 liters in volume.

Drilling mud and cuttings

A water based mud will be used to drill the exploratory well. the drill cuttings and mud will be disposed into a pit lined with an impermeable geo-membrane. The pit will be of larger than the required capacity to accommodate overflows. At the time of restoration, the pit will be backfilled with the cuttings encapsulated within the liner and with a topsoil cover. Since the mud and cuttings will be non-hazardous, no impacts on soil or groundwater will occur.

b. Cumulative Impacts

Provided all mitigation measures recommended in this IEE are followed, contamination of soil or water resources is not expected to occur and hence impacts will not be cumulative. For the purpose of risk assessment, the likelihood of oil spillage during transportation has been assessed as possible. Because any contamination that may occur will be remediated following standard protocols, the effect of such spillage will, therefore, not be cumulative.

c. Mitigation Measures

- Sewage generated at the campsites will be disposed of in septic system comprising of septic tanks and soak pits.
- Wastewater from laundry, kitchen washings and showers will be disposed of into separate soak pits.
- Soak pits will be built on absorbent soil and located 300 m away from a surface water source or ground water well.
- Soak pits will be constructed such that surface runoff cannot enter into the pits.
- Soak pits will be designed to accommodate wastewater generated during the total duration of the operation.
- In case the soak pits get filled during operation, grey water will be sprinkled over access tracks. Sprinkling of grey water will be done in such a manner that the ponding of water is avoided.
- Recyclable and reusable wastes will include glass, metals etc. These wastes will be sent to a certified waste contractor
- At the time of restoration, the septic tanks will be dismantled in place and backfilled with at least 1 m of soil cover above the surrounding natural surface level.
- Implement plans for hazardous materials management, waste management, and storm water management.
- Develop a spill prevention and response plan for addressing storage locations of hazardous wastes, spill prevention measures, training requirements, waste-specific spill response actions, spill response kits, and notifications to authorities.

- Provide secondary containment for all on-site hazardous materials and waste storage, including fuel. Fuel storage should be a temporary activity and fuel storage facilities should be removed immediately upon completion of the construction and decommissioning phases.
- Document accidental releases so that corrective actions may be taken.
- Vehicles will only be washed in designated areas within campsites.
- Vehicles will be daily checked for fuel or oil leaks. Vehicles with leaks will not be operated until repaired.
- All fuel and oil storage areas will have a concrete pad underneath to prevent soil contamination in case of leaks or spills.
- All fuel tanks will be properly marked to highlight their contents.
- Fuel and oil storage areas will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area should be equal to 120% of the total volume of fuel stored.
- Fuel tanks will be daily checked for leaks and all such leaks will be plugged[24] immediately.
- The soil contaminated from major spills may require specialized treatment such as incineration.
- A spill prevention and contingency plan will be prepared to deal with moderate and major spills.
- Shovels, plastic bags and absorbent material will be present near fuel and oil storage or handling areas to attend spills and leaks.
- Used oils and vehicles related waste will be transported to local contractors for recycling.
- Waste pit at the site will be lined with a HDPE liner.
- The drill cuttings and mud will be disposed into a pit lined with an impermeable geo-membrane. The pit will be larger than the required capacity to accommodate overflows. At the time of restoration, the pit will be backfilled with cuttings encapsulated within a liner and with a top soil cover.

Characteristics	Impact
Duration	Medium
Extent	Local
Likelihood	Possible
Consequence	Minor
Reversibility	Reversible
Significance	Low medium

[24] *A dense mass of material that obstructs a passage*

5.3.3 Climate and Ambient Air Quality

a. Potential Impacts

During the drilling operations potential sources of impact will include generation of dust emission from vehicle movement, exhaust emissions from generator and vehicles. Moreover, additional sources will include emissions during construction, emissions during flaring and possible H2S emissions.

b. Impact Assessment

The source of emissions during drilling will not be significant enough to alter the ambient air quality. Monitoring of air emissions from generator used in exploration activities shows that the emissions remain within the NEQS limits. The emissions will also disperse quickly with the prevalent wind currents.

Exhaust emissions from generators and vehicles

As discussed earlier, stack emissions from generator, used at the campsite and the well site will, generally remain within the NEQS limits. Any slight deviation from the NEQS will not have any impact on the environment, as the emissions will quickly disperse with the prevailing wind currents. Control over black smoke from vehicles and construction machinery shall be kept by maintaining visual monitoring and tuning or maintenance of the vehicles/machinery.

Dust emissions due to construction and road travel.

Dust emissions due to construction activities and road travel will deteriorate the ambient air quality. Since the construction activity will be confined to a specified area and vehicle movement will on a specified track, therefore, the scale and duration of effect on air quality will be very limited and will disappear when the activity stops due to prevailing wind.

c. Cumulative Impacts

Construction of project facilities and drilling operation are considered to be short to medium term activities. It is expected that all short term sources of emissions will be non-cumulative in nature as the operations or the sources of emissions will be staggered and may not run parallel, the level of emissions from the individual operations will not be significant and emissions from each operation will disperse quickly with wind. There would be no long term impacts on ambient air quality due to construction and drilling activity. Any effects are not considered to be cumulative due to the high elevation of project area which would allow easy dispersion of contaminant with prevailing wind current.

d. Mitigation Measures

- Minimize the amount of disturbance and areas cleared of vegetation.
- Require emission control devices on drilling and other equipment and specify use of low-sulfur fuels to reduce emissions.

- Use dust abatement techniques on unpaved, vegetated surfaces to minimize airborne dust and during earthmoving activities, prior to clearing, excavating, backfilling, compacting, grading, and during blasting.
- Burning of waste and combustible material at site and in camp, during construction and operation phases, will not be allowed.
- Revegetate disturbed areas as soon as possible after disturbance. (This should include interim revegetation along road beds, once heavy construction is completed.)
- Cover construction materials and stockpiled soils if they are a source of fugitive dust.
- Train workers to handle construction materials and debris during construction and dismantlement to reduce fugitive emissions.
- Keep soil moist while loading into dump trucks and cover it before traveling on public roads.
- Keep soil loads below the freeboard of the truck.
- Minimize drop heights when loaders dump soil into trucks.
- Tighten gate seals on dump trucks.
- Compressors and pumps should be powered by electric motors where strict air emission rules would impede the use of gas or oil.
- Campsites will be located at least 500 m away from communities.
- Dust emissions due to road travel will be minimized by regulating vehicle speeds and watering of the access track.
- Generators and vehicles used will be maintained in a good condition to ensure that emissions are kept to a minimum level.
- During operation phase, emissions from all point sources and ambient air quality should also be monitored to check compliance with NEQS and the World Bank standards respectively.
- Dust emissions during construction activities should be minimized by good management practices such as locating stock piles out of the wind direction, keeping the height of the stock piles to a minimum, keeping earthwork areas damp etc.
- During construction, leveling or widening along the access road will be done in sections, immediately followed by sprinkling of water and also preferably compaction (where required).
- In the event of any release of Hydrogen Sulfide gas above safe acceptable limits emergency response procedures will be adopted. In this regard H_2S will be continuously monitored at the well location and safety drills will be conducted on regular basis to deal with the emergency situation.

e. Residual Impacts

It is believed that after applying the recommended mitigation measures, no deterioration of air quality will occur.

Characteristics	Impact
Duration	Short
Extent	Local
Likelihood	Unlikely
Consequence	Minor
Reversibility	Reversible
Significance	Low medium

5.3.4 Impacts due to noise pollution

a. Potential sources

Sources of noise during drilling related activities will be generators, vehicles, drilling rig and construction equipment and machinery. These sources of noise can be categorized as short term and intermittent arising from drilling activities.

b. Impact Assessment

Although increased noise levels during drilling operations will not accumulate but can individually be a source of nuisance for locals and source of disturbance to wildlife. Monitoring of actual noise level from drilling rigs and campsites has shown that noise during construction and drilling attenuates to ambient level after approximately 300 m from well and camp sites.

Noise levels from all vehicles comply with NEQS level of 85 dB at 7.5 m from the source and reach the ambient noise level in the area at distances ranging from 40 to 70m from the source. Noise levels from camps and from operation of bulldozers attenuate to ambient level of 55 dB (A) at 300m, and 400m distance respectively from the source.

As the well site and campsite will be located at distances greater than 500 m from communities, the impact of noise emission from activity areas or the campsite on the settlements will not be considerable. Similarly, effects of vehicle noise on communities will also not occur if the access tracks maintain a reasonable safe distance from communities. Any effects of noise during the operation shall be mitigated by the measure listed below.

c. Mitigation Measures

- Well site and camp site will be located 500 m away from the nearest community.
- Position all stationary sound-generating equipment (i.e. compressors, pumps and generators) and exploratory wells as far as possible from nearby residences and other sensitive receptors.

- Whenever feasible, schedule diverse noisy activities (e.g., blasting and earthmoving) to occur at the same time, since less-frequent noisy activities would be less irritating than frequent less-noisy activities.
- All equipment should have sound-control devices.
- Route heavy truck traffic, supporting construction and drilling activities away from residences and other sensitive receptors.
- It shall be ensured that generators, vehicles and other potentially noisy equipment used will be in good condition.
- Noise levels at communities nearest to the well site, campsites and access tracks shall be monitored by site HSE officer. In case these are found to exceed safe acceptable limits appropriate mitigation shall be taken.
- The use of pressure horns shall not be allowed.
- Movement of all project and personnel vehicles shall be restricted within work areas.
- Generators will be kept within enclosures to minimize dispersion of noise.
- In areas with higher noise levels or longer shifts, use of ear plugs and earmuffs will be ensured among the workers.

Characteristics	Impact
Duration	Short
Extent	Local
Likelihood	Unlikely
Consequence	Minor
Reversibility	Reversible
Significance	Low medium

5.3.5 Use of water

a. Potential

Use of water from local surface or ground water resources for the project resulting in decreased availability of water for local users.

b. Impact assessment

The extraction of water for project activities can affect groundwater availability in the short term, which implies that the groundwater immediately available to the communities may fall. This should not however, affect the long-term availability of the area's water resources. There is no village or human settlement in the immediate surrounding of the well location. The community nearest to the project area is more than 15 km towards the east.

Short-term water extraction can affect the quantity and, indirectly, the quality of water available to local communities. In this discussion, 'short-term' refers to a time period ranging from a few hours to a few days.

c. Mitigation Measures

- The quantity of water used during drilling will be kept to the minimum required by taking prudent water conservation measures on site. A complete record of water consumption will be maintained by PPL Drilling and Construction Department.
- Water from the surface water will only be used after ensuring that the available capacity at the surface or ground water is roughly 50% greater than the project demand. Discharge from the PPL installed tube well/alternate will be regularly monitored to check any changes in the yield of the wells.
- Water from native's source (surface or ground) will only be abstracted after getting formal permission from the concerned department and fulfilling the requirement of IEE and EMP.
- Marginally sweet water wells will be used for drilling and other project related activities.
- Water from a local well will only be used after ensuring that the available capacity at the tube well (safe yield minus local demand) is at least 50% greater than the project demand. Discharge from tube well will be regularly monitored to determine any change in the yield of the well. if a single well fails to meet this requirement water will be obtained from multiple wells such that each well meets the above mentioned requirement.
- If a new water well is to be installed, the well will be located 500 m from existing local wells and will be designed to abstract water preferably from deep aquifer not being used by local communities.
- PPL and project contractors will pay proper and justified compensation for water utilized to the owners of water well.

d. Residual Impact

Impact emerging even after application of mitigation measures is evaluated as follows;

Characteristics	Impact
Duration	Medium
Extent	Local
Likelihood	Possible
Consequence	Minor
Reversibility	Reversible
Significance	Low medium

5.3.6 Blockage of Natural Drainage

a. Impact Assessment

The terrain of project microenvironment is hilly and uneven and proposed well site is on a mountain top. This suggest that there would be non-perennial streams/water channels in the drilling site, camp sites and route leading to project area. Therefore, the likelihood of possible blockage of natural drainage from either the project location, establishment of campsite, drilling or production activities is expected.

b. Mitigation Measures

- Area around the campsite(s) shall be landscaped to avoid blocking of natural drainage.
- Preferably the access roads construction during the project will be aligned to avoid crossing of water courses and streams.
- Fjord/Irish crossings and pipe culverts will be provided at all water/stream course and minors crossings to avoid blocking of natural drainage.

5.3.7 Site restoration after drilling activities

a. Impact assessment

In environmentally sensitive areas restoration of well site and associated facilities (including access track and campsite) is of utmost importance. As these facilities do not occupy large areas of the wildlife and vegetation habitat, retention of these sites or improper disposal of wastes left at the end of the drilling or construction activities would not be in conflict with the principle of least environment disturbance over the least possible time period in these areas.

Restoration of the well site, access track and campsite will depend on whether the drilled well is a success or failure. The restoration measures that will be carried out have been separately listed as follows for the two possibilities;

Complete restoration – Dry well

If there are no indications of a commercial quantity of oil and gas, either before or after testing, then the well will be declared dry and will be plugged and abandoned in line with the local regulations and good industrial practices. The well site, camp and portion of access track which leads to the well site from the main community track will be restored.

Mitigation measure – Complete restoration

- All equipment and machinery at the well site will be demobilized.
- All wastes at the well site will be disposed of according to the requirement of the IEE.
- Liner from water and waste pits at the well site may be taken out and reused or disposed of in the existing pits with proper restoration.

- All concrete structures at the well site will be broken and either transported out of the project area by site restoration contractor for sale or reused or disposed of into the pits.
- All pits at the well site will be backfilled.
- The areas covered by the portion of the access track that will be of no use for other wells will be restored, in that all gravel topping will be removed. This scenario will be applicable only if the locals require the portion of the track to be restored or otherwise it will be left on the site on the consent of the locals.

Partial Restoration – Producing Well

An alternative situation is if commercial quantities of oil and gas are discovered, before or after testing then the well will be suspended while testing results are analyzed, reservoir modelling conducted and production equipment ordered. In this case, the oil and gas bearing zones in the well will be squeeze-cemented and further cement plugs and permanent packer /cement retainers will be set above the perforation, the csing shoes and at surface.

Mitigation measure – Partial restoration

- All wastes at the well site will be disposed of according to the requirement of the IEE.
- Liner from water and waste pits at the well site may be taken out and reused or disposed of in the existing pits with proper restoration.
- All concrete structures at the well site will be broken and either transported out of the project area by site restoration contractor for sale or reused or disposed of into the pits.
- All pits at the well site will be backfilled.
- The areas covered by the portion of the access track that will be of no use for other wells will be restored, in that all gravel topping will be removed. This scenario will be applicable only if the locals require the portion of the track to be restored or otherwise it will be left on the site on the consent of the locals.

5.4 Biological Environment

5.4.1 Impacts on Ecological Resources

a. Potential Sources

Drilling of well involve mobilization of a large number of workers, vehicles and also removal of vegetation during land clearance. These activities can disturb the wildlife in the project area. Small animals, birds and reptiles can be forced to move to other places due to increased human intervention, destruction of burrows and nests and indirectly by noise and vibrations due to operation of equipment and heavy vehicles.

b. Impact assessment

During drilling operation, vegetation and topsoil would be removed for the development of well pads, access roads, pipelines and other ancillary facilities. This would lead to a loss of

wildlife habitat, reduction in plant diversity, potential for increased erosion and potential for the introduction of invasive or noxious weeds. Indirect impacts to vegetation would include increased deposition of dust, spread of invasive and noxious weeds and the increased potential for wildfires. Dust settling on vegetation may change or limit plant's abilities to photosynthesize and /or reproduce. Over time, a composition of native and /or invasive vegetation would become established in areas disturbed by wildfire. Minor impacts are envisaged that may cause the disturbance to the wildlife and their habitat, which may be addressed properly.

c. Mitigation Measures

- Areas of dense vegetation and tree clusters will be avoided.
- Open fires will not be allowed anywhere.
- Fuel wood and shrubs will not be used as fuel during field operations.
- Water contaminated during the field activities will not be released on the open land, as this may be harmful to vegetation and wildlife. All such effluents will be directed to the appropriate disposal points, e.g., lined evaporation pits.
- Well site and campsite areas will be kept to a minimum.
- Earthen pits for preparation and disposal of bentonite mud and drill cuttings will be located in an area where minimum vegetation removal is involved.
- The mud waste will be handled in HDPE (High Density Polyethylene) lined pit and consequently treated through flocculation process for final disposal by a EPA approved contractor.
- Areas identified as active denning, nesting, spawning, migration and feeding areas shall be avoided as far as possible.
- Cutting of old trees will be avoided to conserve the nests of birds; however, if it is absolutely necessary to cut the trees then the nests will be carefully displaced to other nearby trees or a place of similar height. PPL will therefore work out a relocation plan in collaboration with the Wildlife Department. The plan would include:
  a) conducting survey to compile an inventory of all species,
  b) allocate suitable sites in the protected area where the dislocated animals could find refuge, and
  c) relocate the animals captured while their habitat is being endangered or is being removed.
- All mitigation measures to minimize noise levels, dust emissions, air emissions and waste management will be adhered to in order to avoid impact on wildlife.

Characteristics	Impact
Duration	Medium
Extent	Local
Likelihood	Possible
Consequence	Minor

Characteristics	Impact
Reversibility	Reversible
Significance	Low medium

5.4.2 Impacts due to Hazardous Materials and Solid Waste Generated

a. Potential Impact

Hazardous materials and solid waste impacts are related to the types and amount of equipment and machinery used for the project, chemicals used in various processes, training and the methods being employed. Solid and industrial waste would be generated during drilling activities. Much of the solid wastes generated would be expected to be non-hazardous; consisting of containers and packaging materials, miscellaneous wastes from equipment assembly and construction crews (food wrappers and scraps) and woody vegetation. Industrial wastes would include minor amounts of paints, coatings and spent solvents. Drilling wastes include hydraulic fluids, pipe dope, used oils and oil filters, rig wash, spilled fuel, drill cuttings, drums and containers, spent and unused solvents, paint and paint washes, sandblast media, scrap metal, solid waste and garbage. Wastes associated with drilling fluids include oil derivatives (e.g. Polycyclic Aromatic Hydrocarbons (PAHs)), spilled chemicals, suspended and dissolved solids, phenols, cadmium, chromium, copper, lead, mercury, nickel, and drilling mud additives (including potentially harmful contaminants such as chromate and barite).

Produced water (water that coexists with oil and gas in the formation and is recovered during well development) generation can be an issue during the drilling/development phase, although it usually becomes a greater waste management concern over the long-term operation of an oil or gas field because water production typically increases with the age of the production well.

In some locations, produced water may carry naturally occurring radioactive materials (NORM) to the surface. Typically, the NORM radio nuclides (primarily radium-226, radium-228, and their progeny) are dissolved in the produced water but a portion of the NORM can precipitate into solid form in scales and sludge that accumulates in pipelines and storage vessels.

b. Impact Assessment

Adverse impacts such as contamination of water sources and soil which would result in impact on flora and fauna and even death of animals, if hazardous wastes are not properly handled and are released to the environment.

Proper management of NORM-bearing produced water and solid wastes are critical to prevent both occupational and public human health risks and environmental contamination. NORM wastes are a problem generally associated with long-term operation of an oil or gas field, but can also be associated with the drilling/development phase.

c. Mitigation Measures

- Prepare a comprehensive list of all hazardous materials to be used, stored, transported and disposed of during all phases of activity.
- Develop a hazardous materials management plan addressing storage, use, transportation and disposal (interim and final) for each item in the comprehensive list.
- Develop a waste management plan identifying anticipated solid and liquid waste streams and addressing determination, inspection and waste minimization procedures, storage locations and waste-specific management and disposal requirements.
- Include a recycling strategy to be practiced by workers during all project phases.
- Develop a spill prevention and response plan for addressing storage locations of hazardous wastes, training requirements, waste-specific spill response actions, spill response kits, and notifications to authorities.
- Develop a storm water management plan to ensure compliance with regulations and prevent off-site migration of contaminated storm water or increased soil erosion.
- Train employees to promptly contain, report and/or clean up any oil or hazardous material spill.
- Provide secondary containment for all on-site hazardous materials and waste storage, including fuel. (Fuels storage should be a temporary activity and fuel storage facilities should be removed immediately upon completion of the construction and decommissioning phases.)
- Containerize and periodically remove wastes for disposal at appropriate off-site permitted disposal facilities. The goal would be to minimize the amount of hazardous materials and waste onsite.
- Minimize the generation of both solid and liquid wastes (including produced water) from well drilling and well development operations that are potential environmental contaminants. Options to minimize waste include use of several different directional drilling techniques (which minimize the number of wells required and consequently, the amount of drill cuttings), drilling the smallest possible size well bore, use techniques that reduce the amount of drilling fluids requiring ultimate disposal and consider the use of drilling fluids that generate fewer waste cuttings.
- Consider the use of drilling and fracking fluids with the lowest potential for producing wastes and with least potential to harm the environment and/or contaminate water resources. Employ drilling and recovery systems that recycle drilling fluids and minimize the amount of final disposal of contaminated fluids and materials.
- Isolate surface reserve pits where drill mud and drill cuttings and produced water are stored or where they are ultimately disposed of, from both surface and ground water

resources (through use of appropriate top and bottom liners and top soil and vegetative cover).

- Separate water produced along with oil or gas for storage, treatment, and/or ultimate disposal and ensures that it is not released to contaminate either surface water resources or potable underground aquifers.
- Employ a long-term monitoring program to ensure that mitigation measures (e.g., closure of reserve pits) employed throughout the project is effective.
- Much of the solid material can be recycled and sold as scrap or used for other projects; the remaining non-hazardous waste would be sent to permitted disposal facilities. Industrial wastes (oils, hydraulic fluids, coolants, solvents, and cleaning agents) would be treated similarly to wastes during the production phase (e.g. put in containers, characterized and labeled, possibly stored briefly, and transported by a licensed hauler to an appropriate permitted off-site disposal facility).

Characteristics	Impact
Duration	Medium
Extent	Local
Likelihood	Possible
Consequence	Minor
Reversibility	Irreversible
Significance	Low medium

5.5 Socio-economic, Archaeological and Cultural Environment

a. Sustenance income

Acquirement of Agricultural Land and Rangeland

The livelihood of local communities largely depends on agricultural activity and livestock rearing and management. For the drilling operations land will have to be leased from locals. Compensation of the leased land and for standing crop is a standard mitigation practice in the oil and gas industry. The compensation rates, however, should be defined on the basis of prevailing market rate and should be agreed with the local communities. In addition, the district administration should be involved while disbursing the compensation amounts so that the rightful owners of the land are compensated. Any delays in disbursement of compensation amounts should be avoided so that the already marginalized communities of the area are not affected.

Displacement of inhabitants

There are no communities residing within the 500m radius of proposed well sites. Therefore, displacement of communities would not be required for drilling phase.

Use of irrigation water

There is shortage of irrigation water in the area. the use of water can lead to indirect effects, irrespective of what their magnitude maybe, the use of irrigation water is not considered an acceptable option and therefore should be avoided.

Contamination of agriculture land and rangeland

Reduction in farm income may occur and agricultural land may also become incapacitated as a result of oil spills into fields or water course. This should be prevented by adhering to the waste management guidelines recommended in this IEE.

Improper restoration of leased lands

Land areas leased for project facilities such as well site, camp site, access track etc. will be returned to the respective land owners after the completion of operation. If the area returned is not appropriately restored it may not be put to its original use. To ensure that this does not happen especially in agricultural lands, all project facilities will be restored to as close to their original condition as possible.

b. Positive impacts

Positive impacts of project may include:

- Increase turnover of local businesses, shops, hiring of vehicle and water bowsers due to an increased demand from project contractors and their employees.
- Increased income of local residents due to employment in the projects.

c. Water availability

There is limited water available within project area for drinking purposes. Within the agricultural lands, sweet water is available due to recharge from rain or non-perennial canals. Almost all local communities meet their domestic water requirement from shallow hand pumps. Existing local deep tube wells are only used to supplement irrigation water supply from the canal water in periods of low flow. These tube wells, being deep and used occasionally by local communities can be used during drilling and construction activities but only after ensuring that the water in excess of the need of the locals is bought. If a new well is to be bored, it should abstract water from deeper aquifers (more than 200m deep) and should be located at least 300 m away from an existing water well.

d. Employment

A positive impact of the project is that PPL and its contractor will give priority to hire local labor. The actual number employed and their wages is dependent on the contractors' requirements. Due to increased commercial activities in the area, there will also be more employment opportunities in local restaurant and shops. This will positively impact the morale and psyche of the local residents.

The local residents may be employed against the category of unskilled labor since semi-skilled or skilled labor may be difficult to be found in the area. In providing employment

to locals PPL should ensure that preference is given to communities in close proximity to the project area and that amongst them equal opportunity is provided to all tribes and castes.

e. Health, Safety and Security

Improper disposal of project wastes and dust and exhaust emissions may adversely impact the health of local population. To avoid these, maximum possible distance should be maintained from local communities as suggested in the IEE and all mitigation measures related to waste management should be implemented.

Project activities, particularly increase in traffic, operation of heavy machinery and generators will result in an overall increase in noise pollution, dust and vehicular emissions. To avoid these maximum possible distance should be maintained as suggested in the IEE.

The well sites and rig camp will be located more than 500 m away from settlements. As assessed, no effect of the project noise will occur on the local communities.

The operation may affect the safety of inhabitants of the area in the following ways:

Issues of road safety and conflicts between residents and construction contractors with regards to employment. To avoid these, access roads should be routed away from communities and employment should be provided in a just manner in consultation with local communities.

f. Mobility and Transportation

Metaled roads connect most of the villages and the ones not connected in this manner are relatively close to each other. Villagers would not have to travel a great distance to nearby villages on a katcha road or path. There are numerous katcha paths connecting different villages with each other. These have largely been prepared by locals to commute between villages and agricultural lands.

The construction of any new access tracks in the area will have a positive effect in that it will improve access for local residents and will also reduce travel time and expense. This may also open other opportunity for the local population in terms of transportation.

g. Community grievance

During drilling activities, grievance from local communities may arise due to actual or perceived unjust distribution of employment, land compensation and other related matter. These should be identified through consultation with communities and resolved in order to have a long term working relationship with the communities. The complaints should be recorded by consultation with local communities on regular basis or by allowing communities to record complaints in complaint registers provided at the project campsite. This will help maintain a long term working relationship with the communities.

h. Damage to cultural, Religious and Archaeological Resource

Cultural sites such as shrines, mosques and graveyards exist in the project area, and are easily visible. Well site, camp site and access tracks should be located at appropriate

distances from cultural sites to avoid impediment in access of local communities (specially women) to these sites.

Archaeological finds have been identified in the IEE during the baseline survey conducted in the project area. The construction and drilling activities will be confined to the limited area, therefore, no impacts will occur due to construction and drilling activities. Similarly, access tracks have been aligned by providing offset to the archaeological finds to avoid impacts of construction and drilling activities on them.

Cumulative Impacts

a. Sustenance Income

Considering that for all land acquisition local communities will be appropriately compensated and all other effects on sustenance income will be mitigated following the recommendations of IEE no cumulative impact will occur.

b. Employment

As local employment will be a feature of the project, the benefits to the communities will be cumulative. The effects of local employment will be positive for which no characterization has been done. The significance of the impact is, however, assessed to be medium and the duration in case of drilling is assessed to be short term.

c. Health, Safety and Security

Except for dust, all other impacts can be fully mitigated and, therefore, will not accumulate spatially or temporally. Dust emissions will need to be appropriately monitored and mitigated following the recommendations of the IEE.

d. Mobility and Transportation

The effects of construction of new roads will be positive and cumulative in nature. Residual impacts will be positive in nature and therefore, have not been characterized in detail.

e. Community Grievance

Community grievance can be cumulative in nature and therefore should be resolved when they are raised.

f. Damage to Cultural, Religious and Archaeological Resources

Provided all mitigation measures are followed, no damage to cultural, religious or archaeological site will occur and the impacts will not be cumulative.

Recommended controls and Mitigation Measures

- All community grievance will be recorded and maintained in a Community Complaint Register. In addition to this close liaison will be maintained between the community and PPL CSR throughout the construction and drilling phase.

- Compensation amounts for land leased for various project components will be disbursed in an equitable and transparent manner.
- Compensation amounts will be paid to the land owner before land is acquired, if not possible, then amount should be paid as soon as possible.
- Loss of standing crop, traditional land rights and community ownership will be given due consideration while determining compensation amounts.
- Compensation amounts will be settled based on prevailing market rates and will be settled after an agreement is reached between the local residents and the client.
- All mitigation measures related to management of waste, m=noise and dust emissions suggested in the IEE will be adhered to.
- PPL and its contractors will give priority to unskilled local residents during the project activities.
- Labor from local communities will be recruited equitably from amongst the various tribes. Avenues for conflict resolution will be open and manpower procurement procedure will be transparent.
- Local residents living closest to the project location will be given priority in the employment process.
- Water sources currently being used for irrigation by the resident communities will be exploited only after complying with the relevant requirements of the IEE.
- Local sources of drinking water will be used only after complying with the relevant requirements of the IEE.
- Flow of water in canals or water crossings will not be impeded.
- Any damage to canals, watercourses, local roads or other infrastructure will be repaired.
- Strict compliance of PPL's HSE guidelines will be observed.
- Drivers will be counseled for safe driving practices and safe speed limits for vehicles will be followed.
- Bypasses to all settlements will be provided. Minimum distances recommended in the IEE between the project facilities and local settlements will be adhered to.
- Confidence of local women will be gained through gender sensitive and balanced community development initiatives.
- In order to keep nearby local communities informed of the progress of the operations, communication channels will be maintained between the local spiritual leaders and community elders and PPL.
- Project staff will respect cultural norms.

- Appropriate offsets will be provided from sites of religious, cultural and archaeological significance.

Residual Impacts

- Health, Safety and Security

Characteristics	Impact
Duration	Medium
Extent	Local
Likelihood	Possible
Consequence	Moderate
Reversibility	Depends on type of injury sustained
Significance	Medium

- Damage to cultural, religious and archaeological resources.

Provided all mitigation measures are followed, no residual impact will occur.

Characteristics	Impact
Duration	-
Extent	Local
Likelihood	Unlikely
Consequence	Negligible
Reversibility	Irreversible
Significance	Low

Table 5.1: Environmental Impacts & Characterization Matrix

Activity & Source	Nature of Impact	Duration	Extent	Reversibility	Likelihood	Severity	Significance
Landscape & Soil Erosion							
• Construction of proposed well site location, • Camp siting • Construction of access tracks.	Direct	Medium-term; depend on the availability of hydrocarbon reserves.	Local	Reversible	Possible	Medium	Low medium
Noise							
• Transportation of heavy machinery, materials, equipment & personnel. • Drilling operations.	Direct	Short to medium term	Local	Reversible	Possible	Minor	Low medium
Dust Emission							
• Dirt tracks by project related vehicles. • Earthworks and construction for campsite. • Combustion products (NOx, SO_2, PM, CO and VOC) from diesel generators used in the camps to generate electricity.	Direct	Medium term	Local	Reversible	Possible	Moderate	Low medium
Air Emissions							
• Exhaust emissions produced by generators. • Exhaust fumes from vehicles and construction machinery.	Direct	Short term	Local	Reversible	Low (unlikely) as mitigation measures will ensure that air pollution remains within acceptable limits.	Minor	Low
Water Abstraction							

Table 5.1: Environmental Impacts & Characterization Matrix							
Activity & Source	**Nature of Impact**	**Duration**	**Extent**	**Reversibility**	**Likelihood**	**Severity**	**Significance**
• Water required for drilling operation and other project activities.	Direct	Medium- term; depend on the rainfall pattern and recharge regime of the deep aquifer.	Local	Reversible	Possible	Minor	Low Medium
Soil and Water Contamination							
• Domestic waste (sanitary and kitchen discharge). • Oil and grease from vehicles and machinery. • Sediments from altered land surfaces (campsite). • Stored fuel, oil and other chemicals.	Direct	Medium term (after implementation of mitigation measures)	Local	Reversible	Possible	Minor	Low Medium
Impacts on Wildlife							
• Improvement and construction of the access road. • Removal of vegetation only where required.	Direct	Short term to medium term	Local	Possible	Possible	Minor	Low Medium

Matrix Formula:				
	CERTAIN	**LIKELY**	**POSSIBLE**	**UNLIKELY**
LIKELIHOOD / PROBABILITY	• The occurrence during abnormal /unplanned event on monthly basis or • During normal activity, the aspect occurs continuously as a result of normal operating condition	• The occurrence during abnormal /unplanned event is once per quarter or • During normal activity, the aspect occurs twice a month	• The probability of occurrence during abnormal / unplanned events is once every six months or • During normal activity, the aspect occurs once a month	• The occurrence of aspect during abnormal or unplanned event with the probability of occurrence of once per year or • During normal activity, the aspect occurs once in six months

SEVERITY ↑	**Critical**	Low Medium	Medium	Medium High	High
	Moderate	Low Medium	Medium	Medium High	Medium High
	Minor	Low Medium	Low Medium	Medium	Medium High
	Negligible	Low	Low Medium	Medium	Medium
		Unlikely	**Possible**	**Likely**	**Certain**
		→ **LIKELIHOOD FREQUENCY**			

6.0 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

6.1 General

The Initial Environmental Examination (IEE) for the proposed drilling activities in Kalat Block (2866-2) has identified impacts that are likely to arise during the exploration activities. The IEE has examined, in detail, both positive and negative impacts that may arise during various activities carried for the drilling of wells, from establishment of camp site, provision of logistics to final demobilization and site restoration. Mitigation measures for adverse impacts identified have been proposed. These measures include engineering controls, administrative management and monitoring practices and compensation in form of monetary assistance. The proposed mitigation measures are based on good understanding of the sensitivity and behavior on environmental receptors within the project area, past experiences, case studies, legislative controls, guidelines and experts' advice. For any residual impacts (impacts remaining after applying the recommended mitigation measures) or for impacts in which there has been a level of uncertainty in prediction such as level of impact on air quality, monitoring measures have been recommended.

For effective implementation and management of the mitigation measures and monitoring requirements an Environmental Management Plan (EMP) has been prepared and presented in this chapter. The EMP satisfies the requirement of Pakistan Initial Environmental Examination and Environmental Impact Assessment Review Procedure, 2000.

Environmental management is an integral component of overall planning and implementation of projects that includes policy development, organizational structure, planning activities, responsibilities, procedures and resources for development, implementing, achieving, reviewing and maintaining the environmental program and achieving environmental goals.

The present document has been prepared in accordance to environmental management guidelines that will be used as a contract document for the contractor(s) and their personnel during the project activities. Several aspects have been identified in this EMP to prevent or mitigate that environmental impact of proposed Drilling Activities in Kalat Block 2866-2, Balochistan.

6.2 Purpose of EMP

PPL has committed developing and implementing a comprehensive EMP to help ensure a high level of environmental protection throughout this undertaking. The next higher level is to seek and ensure environmental protection of the general public. The purpose of EMP is to:

- Ensure implementation of mitigation measures proposed in the IEE report;
- Ensure that proponent meet all environmental related legal obligation;

- Provide a mechanism for taking timely actions for unanticipated environmental situations;
- Define the various roles, responsibilities and provide a means of effective communication regarding environmental issues among them;
- Provide concise and clear instructions to project personnel and contractors regarding procedures for protecting the environment and minimizing environmental impact;
- To prevent or minimize emissions, effluents, spills and dumping etc. into air, water, and soils for protecting the environment;
- Communicate changes in the program through the revision process; and
- Post implementation phase monitoring.

6.3 Environmental Management Framework

Due to the nature and scale of activities, some Health, Safety and Environmental risks are associated with the company's operational activities. In order to reduce these risks to as low as reasonably practical, various control measures are adopted. To continuously improve HSE performance, all these controls are further translated into objectives, targets and programs as per the requirements of ISO 14001 and OHSAS 18001 systems. PPL endeavors to perform its field activities in a manner to either eliminate or minimize the risks to the lowest possible level.

Environmental management of the Project will be undertaken within a comprehensive framework comprising:

- PPL's Health, Safety and Environmental Policy Statement;
- PPL's Health, Safety and Environmental Quality Department (HSEQ);
- Operational controls and specific environmental procedures within the project Environmental Management Plan (EMP); and
- Implementation of Environmental Management and Monitoring Plan.

6.4 PPL's Commitment to Health, Safety and Environment

PPL has in place a Health, Safety and Environmental (HSE) management system incorporating an HSE Policy Statement. The HSE Policy Statement and management system set out PPL's top-level goals and commitments and the framework within which these will be applied. Operational controls and management procedures will be set out detailing how specific operations will be carried out. The management outlines the systems and procedures developed to ensure that the project activities in the field are managed safely, with due regard for the environment and in a quality manner. The Health, Safety, Environment and Quality department at PPL gives attention to the following core aspects;

- Policy, Standards and Procedures;
- Safety Management;

- Emergency Response;
- Environmental Considerations;
- Risk Management;
- Quality Assurance;
- Organization; and
- Document Control

6.5 Structure of EMP

The environmental management plan is divided into the following core components:

- Organizational Structure and Roles and responsibilities;
- Implementation of Environmental Management Plan
- Mitigation matrix for each project phase;
- Monitoring plan for the project;
- Worker's Health and Safety Plan
- Waste management plan
- Equipment Maintenance
- Emergency Response Plan
- Site Restoration
- Change Management Plan

6.6 Organizational Structure and Roles and Responsibilities

6.6.1 Organizational Structure

The proposed project includes the following organizations:

- PPL as the project proponent and owner of the EMP
- Contractor and Subcontractor
- SEPA as regulatory body

In addition to the above organizations, Independent Monitoring Consultant (IMC) will also be involved for compliance and effects monitoring. The general roles and responsibilities of PPL and the Contractors are detailed in the following sections.

6.6.2 Roles and Responsibility

For the proposed project, PPL will appoint contractor(s) for the project activities. The contractor(s) will be responsible for implementation of, or adherence to, all provisions of the IEE and the EMP and with any environmental and other codes of conduct required by PPL. Overall responsibility for the contractor's environmental performance will rest with the person holding the highest management position within the contractor's organization in Pakistan. Reporting to their management, the contractor's site manager will be responsible for the effective implementation of the IEE and the EMP.

A project operator may be the project manager or any other person designated by PPL to supervise and monitor the project activities. Some of his responsibilities would be to;

- Maintain ongoing liaison with the personnel involved in the project;
- Ensure that prior to commencing work in the project area; all field personnel receive a formal induction which includes notification of the environmental objectives;
- Ensure that employees are adequately supervised so that the environmental objectives are achieved;
- Ensure that no pets, firearms, traps and nets are kept by the contractors and their employees whilst in the project license area; during drilling.

6.6.3 Contractors and Subcontractors

Contractors will be responsible for implementation of, or adherence to, all provisions of the EMP and with any environmental and other codes of conduct required by PPL. Overall responsibility for environmental performance of the operation will rest with the senior management of the contractors. Site managers of the contractors will be responsible for the effective implementation of the EMP.

6.6.4 Environmental Protection Agency

EPA as regulatory body has the responsibility to ensure project's compliance with local environmental laws is always ensured by the proponent. Under section 7 of Balochistan Environmental Protection Act, 2012, EPA has the powers to conduct surprise inspections or visits of the project area to observe the status of environmental compliance of the project.

Table 6.1: Roles and Responsibilities	
General Manager (Operation)	• To liaise with management to ensure a proactive approach is taken on HSE issues; • To ensure the company meets the necessary legislative obligations and drive the continuous improvement of H&S throughout the company. • Approve any change in decision making and authorities in consultation with Manager HSE, if appropriate.
EHS Manager	• To liaison with HSE personnel to ensure alignment with operations and construction activities; • Support HSE personnel by monitoring and analyzing HSE performance to identify improvement opportunities and advancement
Construction Manager	• Carry out construction activates in environmentally sound manner; • Coordination with the HSE officer to resolve issues arising during construction phase; • Manage construction crew and reduce the environmental impacts; • Appoint dedicated environment officers that will understand and tackle environmental issues more easily; • Discuss weekly progress report with HSE Manager and issues concerned to environmental management.
EHS Advisory / Support Personnel	• Provision of health and safety information and, where relevant advice to personnel and health and safety committees; • The systematic identification of workplace hazards, evaluation of their risk and implementation of controls to manage risk; • Reporting of hazards and incidents and for prompt response, investigate and rectify them; • Follow Procedures during emergencies; • Effective health and safety supervisory arrangements
EHS Supervisor /Manager	• Provide overall coordination and guidance to the site HSE efforts; • Develop programs that are designed to reduce exposure to loss via personal injury or illness, loss by fire, loss due to spill of hazardous materials or waste, and comply with governmental regulations; • Supervise and coordinate the efforts of the HSE department staff; • Collaborate on a routine basis with the site manager in appraising the performance of all departments; • Develop recommendations for improvement of procedures, practices and activities directly or indirectly involved in effective execution of HSE functions by site management; • Advise and/or represent site management in all matters concerning compliance with federal and state HSE regulations; • Audit the site from a regulatory and management system perspective and recommend actions to address deficiencies; • Participate in the review of all serious incidents, fatalities, and major disasters; • Collaborate with the site manager in the development and preparation of Executive HSE Committee Meeting agenda; • Serve as a member of site committees for special HSE studies and program development; • Function as liaison with insurance companies, Corporate HSE, local fire and rescue organizations, etc.; • Provides leadership to the site staff for the implementation of new technologies such as behavioral-based safety management concepts; and • Reinforces safe behavior and corrects unsafe behavior.

Table 6.1: Roles and Responsibilities	
Personnel Safety Supervisor	Every supervisor has at least three responsibilities for providing environmental and occupational safety to the personnel. These responsibilities are employee training, provision of personal protective equipment and accident & injury reporting. ***Employee Training*** Supervisors are responsible for ensuring that each new employee, whether temporary or permanent, receives appropriate safety training at the start of employment. Supervisors are responsible for ensuring that their employees receive the necessary safety training based on the employees' nature work. ***Personnel Protective Equipment*** OSHA requires each supervisor assess the hazards of the work area to determine the type of protective equipment needed and to provide training on its use. This review must be documented. Completing the 'Hazard Assessment Form' meets this documentation requirement. The Personal Protective Equipment Plan includes detailed information to assist in selecting the proper protective equipment. ***Accident and Injury*** It is the supervisor's responsibility to report all accidents or injuries that occur to their employees while at work. Each supervisor must ensure that any employee who is injured while at work completes and signs the Employee's Report of Work-Related Injury Form. Additionally, the supervisor must receive the employee form, Accident Witness Statement Form (if the accident was witnessed by another person), and fillout a corresponding Supervisor's Report of Work-Related Injury Form.
Emergency Response Personnel	• Emergency Response Personnel shall be responsible for the reasonable care for their own health and safety and that of other personnel who may be affected by their conduct; • Where required, participating in health and safety information, training and induction procedures; and • Following procedures for emergencies; and, implementation of relevant specific responsibilities.
Staff	• Reasonable care for their own health and safety and that of other personnel who may be affected by their conduct; • Cooperating with others, undertaking tasks in accordance with relevant standard operating procedures, wearing PPEs, seeking guidance from concerned supervisors and participating in health and safety information, training and induction procedures; • Using procedures to report hazards and following predefined procedures for emergencies.
General Responsibilities regarding waste generated	Field management to take effective measures when dealing with wastes generated in the course of their activities i.e. maintenance, repair, modification, erection, construction, fabrication, commissioning, etc. Following Waste Management Practices shall be carried out at the field locations: • Material Safety Data Sheets for each arriving material shall be maintained, reviewed and less toxic alternatives selected when possible; • Wastes generated from each specific area shall be properly collected, segregated, analyzed, labeled, and safely disposed; • Wastes materials stored at facilities shall be minimized; • Samples of emissions and effluents shall be frequently collected to check compliance against NEQS; • Routine inspections of materials and wastes storage areas shall be performed to locate damaged or leaking drums and containers; and • Personnel shall be trained to use sensible waste management practices.

6.7 Implementation of Environmental Management Plan

The implementation of EMP will be the responsibility of PPL's management, supervisory staff and operations staff etc. and will be implemented during all stages of the drilling activity. The information to be included regarding EMP would be risk assessment, environmental management plans, environmental management activities and controls and environmental schedules.

For large projects, carried out over extended periods, the 'Implementation' section of the EMP may be developed using a stage-based format. The stage-based format involves documenting the environmental issues and control measures for each stage of a project. This can create some repetition but is useful in large projects as each table provides a separate checklist for each stage in a project's progression.

6.7.1 Planning and Design of the Proposed Operation

Planning and design of the proposed operations includes drilling techniques and other ancillary operations discussed in the IEE. Following approval, if any design parameter is changed the proponent will assess the environmental impacts that may arise from such change(s). If the impacts are found to be different and in excess of those mentioned in the report, PPL will develop mitigation measures to minimize these impacts and seek approval of the required change from the Environmental Protection Agency concerned.

6.7.2 Approvals

Obtaining approval from EPA does not relieve the proponent of other obligations and hence PPL's Drilling Contractor (DC) will obtain all relevant clearances and necessary approvals required by the government prior to commencing the operations.

6.7.3 Contractual Provisions

The requirements of this IEE in terms of environmental mitigation will be incorporated into the operational plans and procedures with DC.

6.7.4 Training

The key objective of the training program is to ensure that the requirements of the EMP are clearly understood and followed throughout the project. The trainings to the staff will help in communicating environment related restrictions specified in the IEE and EMP.

The PPL HSE advisor will determine the training requirements necessary for understanding and effective implementation of the EMP. The PPL HSE Advisor and DC will then disseminate the necessary training to all personnel.

Project personnel will be trained on various aspects of job safety to ensure sound management of occupational safety issues. They will also be trained on practices of protection of environmental aspects likely to be found susceptible to project activities such as indigenous flora and fauna, wildlife, water bodies and ecological resources etc. Training coordinator will organize trainings in consultation with HSE Officer. It will make sure that

employees understand the issues associated with the proposed activities. Trainings will be arranged on regular basis with notification that it must be attended by all employees.

Trainings identified in EMP are given below:

- Site orientation course
- Training for emergency response and preparedness
- Training for familiarization with site environmental controls.
- Specific environmental training for relevant employees e.g. installing erosion and sedimentation controls, daily checks to maintain controls, cleaning up spills, waste minimization etc.

A firefighting system shall be installed, which will include firefighting water, foam generators and CO_2 extinguishers. The personnel shall be trained on the use and operation of these systems. Equipment such as fire trucks, firefighting equipment, hospital equipment, ambulances and environmental protection and spill control equipment shall also be provided so that they are available in the event of an emergency. The aim is to instruct all personnel on the operation of this equipment and on the procedure to be followed in the event of spills, fire or explosions.

6.7.5 Minimum Distances

The IEE specifies minimum distances to be maintained from environmentally and socially critical features such as communities, water sources, wildlife sensitive areas and archaeological / cultural / religious sites etc. These minimum distances are provided in table below. PPL and the contractors will ensure that these minimum distances are strictly maintained during the execution of the project.

Table 6.2: Minimum distance from sensitive receptor

Area / Facility	Distance (m)		
	Settlement	**Community water well**	**Archaeological/cultural site**
Well site	500	300	300
Construction and rig camp	500	300	300
Soak pits	N.A	300m from ground/surface water resources	N.A

Note: Minimum distance of various project activities from sensitive receptors (not mentioned in this table) will be decided during project execution phase

6.7.6 Communication and Documentation

For effective implementation of Environmental Management Plan, HSE matters will be discussed during daily meetings held on-site. Environmental concerns raised during the meetings will be mitigated after discussions between the PPL's HSE Advisor and DC. Any issues that require attention of PPL's higher management will be communicated to them for action.

a) Kick-off Meeting

Prior to commencement of work and after set-up of the field camp for the drilling; a meeting will be held on-site to discuss implementation of EMP, show commitment to adhere with the EMP and check readiness of the DC to start the project. The meeting will be attended by relevant management staff from PPL and DC.

b) Daily Meetings and Reports

A daily meeting will be held during the drilling and construction operation to discuss the environmental conduct of the operation, non-compliances noted and their remedial measures worked out. The meetings will be recorded in the form of a Daily Environmental Report.

The report will include:

- Summary of project activities on that day;
- Non-compliances observed and mitigation measures taken or required.

c) Weekly Reports

The purpose of these reports will be to review the performance of the operation by reviewing the number of non-conformances and the environmental incidences that occurred during the reporting period, progress on daily action items and to list recommendations for additional controls, mitigation measures or monitoring requirements. The main contents of weekly report will include the introduction, details of drilling activities, resource use, environmental non-compliances, H&S records, socioeconomic issues (if any), photographic records, approvals, inspection and audits, change managements (if any) and trainings etc.

d) Social Complaints Register

The PPL site representatives will maintain a register of complaints received from local communities and measures taken to mitigate these concerns. Liaisons with community members including particularly the land owners/occupiers will be maintained throughout the project to identify and address the concerns of locals. All community complaints received will be sent to the PPL management for further action. Appropriate compensations will be provided to the grieved residents of the project area.

e) Photographic Record

PPL will ensure that a photographic record including the following is maintained:

- Drilling Activities;
- Key non-compliances; and
- Key project activities.

f) Environmental Aspect Register

The IEE study provides environmental impacts of the proposed drilling associated activities. The register identifies the potential impacts of project activities on various environmental resources. The register also categorizes the significance of the impacts on the basis of their severity of consequence and the probability of occurrence. The impact significance has been categorized on the basis of the following criteria.

Table 6.3: Contents of Environmental Aspect Register

Frequency	Consequence Severity		
	Low	**Moderate**	**High**
High (almost certain)	M	H	H
Moderate (Likely)	L	M	H
Low (unlikely/rare)	L	M	M
Where impact significance 'H' implies high risk, 'M' implies moderate risk; and 'L' implies low risk.			

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
1.	Land acquisition	Public grievances					✓	M	L	M	▪ Equitable disbursement of compensation amounts for land leased ▪ Pay compensation amounts as soon as possible ▪ Loss of standing crops, traditional land rights and community ownership will be given due consideration while determining compensation amounts ▪ Compensation amounts will be settled based on prevailing market rates ▪ Manage and maintain a community complaints register
2.	Equipment and crew mobilization and demobilization	Dust and vehicular Emissions	✓				✓	L	L	L	▪ Regulate and monitor vehicle speeds ▪ Maintain vehicles in good condition ▪ Prohibit off-road travel
		Noise and vibration				✓	✓	L	M	M	▪ Prohibit / minimize use of horns by project vehicles ▪ The use of pressure horns will not be allowed
		Safety hazards –locals					✓	H	L	M	▪ Train drivers in responsible and safe driving practices ▪ Observe minimum distances from local communities ▪ Avoid night traveling
3.	Construction /Improvement of access tracks	Soil erosion		✓				L	M	M	▪ Minimize preparation of new access tracks ▪ Width of existing tracks development or improvements will not exceed 3m ▪ Maintain photographic records of all activities to monitor any changes and soil conditions

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Train drivers on mitigation measures related to off-road travel and speeds limits ▪ Prohibit off-road travel
		Soil & Water Contamination		✓	✓			M	M	M	▪ Vehicles will be checked for fuel or oil leaks ▪ Fuel and oil transfer operations will be done using a dedicated fuel vehicle ▪ Drip pans will be used to avoid drips and spills
		Noise & Vibration				✓	✓	L	M	L	▪ Minimize use of horns by project vehicles ▪ Use of pressure horns will not be allowed ▪ Properly maintain vehicles and construction equipment
		Dust & Vehicular Emission	✓				✓	L	M	M	▪ Regulate and monitor vehicle speeds ▪ Minimize dust emissions by employing good management practices ▪ Strictly prohibit off-road travel ▪ Train drivers on mitigation measures related to off-road travel and speeds limits
		Loss of Vegetation				✓		L	M	L	▪ Minimize vegetation clearance ▪ Prohibit use of local vegetation as fuel ▪ Minimize preparation of new access tracks

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Width of existing track development or improvements will not exceed 3m ▪ Avoid clearing of trees
		Loss of Habitat				✓		L	L	L	▪ Minimize total land uptake by access roads ▪ Width of existing track development or improvements will not exceed 3m
		Safety hazards and disturbance to communities					✓	H	M	M	▪ Train drivers on mitigation measures related to off-road travel and speeds limits ▪ Comply with all IEE mitigation related to waste, noise and dust emissions ▪ Manage and maintain a community complaints register ▪ Local sources of drinking water will be used only after complying with relevant requirements of the IEE ▪ Repair any damage caused by project activities to local infrastructure ▪ Observe strict compliance with PPL's HSE guidelines ▪ Project staff to respect all cultural norms
		Disturbance to wildlife				✓		L	L	L	▪ Prohibit hunting or harassment of wildlife ▪ Minimize preparation of new access tracks ▪ Width of existing tracks development or improvements will not exceed 3 m ▪ Select routes with minimum vegetation clearing

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Avoid dense patches of vegetation ▪ Maintain construction vehicles and equipment
4.	Camp(s) construction / Establishment operation	Soil erosion			✓			L	L	L	▪ Minimize vegetation clearing ▪ Avoid cutting of trees ▪ Locate camp site in existing clearing and on leveled land ▪ Minimize total land uptake by the camps ▪ Maintain photographic record of all activities to monitor any changes in soil conditions
		Soil / Water contamination		✓			✓	L	M	M	▪ Dispose sewage generated at the campsite in septic systems comprising septic tanks and soak pits ▪ Dispose wastewater from laundry, kitchen washings, and showers into separate soak pits ▪ Build soak pits in absorbent soil ▪ Keep septic systems at minimum distances of 300 m from surface water sources or ground water wells ▪ Design and construct soak pits to prevent surface run-off ▪ Design soak pits to accommodate wastewater generated during the total duration of the operation ▪ In case the soak pits get filled during the operation, grey water will be sprinkled over access tracks ▪ Solid wastes at the campsite will be disposed of in waste bins ▪ Wash vehicles in designated areas within campsite

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Regularly check vehicles for fuel or oil leaks ▪ All fuel and oil storage areas will have a concrete pad underneath to prevent soil ▪ contamination in case of leaks or spills ▪ All fuel tanks will be properly marked to highlight their contents ▪ Fuel and oil storage areas will have secondary containment in the form of concrete or brick masonry bunds ▪ Ensure provisions for proper fuel and oil storage and handling
		Dust/exhaust Emissions	✓					L	M	M	▪ Maintain vehicles and equipment in good condition ▪ Select campsite locations at least 500 m away from communities ▪ Employ good management practices to minimize dust emissions
		Noise and vibration					✓	L	M	M	▪ Ensure that generators, vehicles and other potentially noisy equipment are in good condition ▪ Select campsite locations at least 500 m away from communities ▪ Minimize use of horns by project vehicles ▪ Use of pressure horns will not be allowed ▪ Restrict all project vehicles and personnel within work areas
		Resource depletion					✓	L	H	M	▪ Employ prudent water conservation measures ▪ Keep complete records of water consumption during project ▪ Obtain water required for drilling operations from local wells, existing or new PPL water wells in the area

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Install (if required) new water wells 300 m from existing local wells ▪ Abstract water from deep aquifer ▪ Water from a local well will only be used after ensuring that the available capacity at the tube well (safe yield minus local demand) is at least 50% greater than the project demand. ▪ Pay proper compensation for water abstraction from local wells
		Disturbance to wildlife				✓		L	L	L	▪ Prohibit hunting or harassment of wildlife ▪ Select campsite locations 500m from any surface water body ▪ Avoid clearing of dense patches of vegetation ▪ Food wastes will not be left in the open ▪ Maintain compressors and vehicles in good condition
5.	Clearing and leveling & Setting up of Drilling Rig	Soil erosion			✓			M	M	M	▪ Minimize vegetation clearance ▪ Avoid cutting of trees ▪ Maintain photographic records of all activities to monitor any changes in soil conditions ▪ Minimize disturbance to natural topography and soils ▪ Regulate and monitor vehicle speeds ▪ Strictly prohibit off-road travel ▪ Train drivers on mitigation measures related to off-road travel and speeds limits ▪ Compensatory plantation in ratio 4-7-10 depends upon size canopy cutting.

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
		Soil contamination			✓			L	L	L	▪ Prohibit solid waste disposal in the field ▪ Regularly check vehicle for fuel or oil leaks ▪ Use a dedicated fuel vehicle for fuel and oil transfer operation ▪ Use Drip pans to avoid drips and spills ▪ The soil contaminated from minor and moderate spills will be removed and disposed of properly.
		Noise and vibration					✓	L	M	L	▪ Minimize use of horns by project vehicles ▪ The use of pressure horns will not be allowed
		Dust/exhaust Emissions	✓					L	M	L	▪ Maintain vehicles in good condition ▪ Dust emissions during land clearance activities will be minimized by good management practices ▪ Minimize dust emissions by employing good management practices
		Loss of vegetation				✓		L	L	L	▪ Minimize clearing of vegetation ▪ Prohibit use of local vegetation as fuel by crew personnel ▪ Avoid clearing of trees ▪ Compensatory plantation in ratio 4-7-10 depends upon size canopy cutting.
		Disturbance to wildlife				✓		L	L	L	▪ Prohibit hunting or harassment of wildlife ▪ Minimize vegetation clearing and land uptake ▪ Avoid clearing of dense patches of vegetation

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Maintain minimum distances of 50 m from surface water bodies during line clearing ▪ Maintain vehicles in good condition to reduce noise
		Safety hazards and disturbance to communities					✓	L	L	L	▪ Train drivers on mitigation measures related to off-road travel and speeds limits ▪ Comply with all IEE mitigation related to waste, noise & dust emissions ▪ Manage and maintain community complaints register ▪ Local sources of drinking water will be used only after complying with relevant requirements of the IEE ▪ Repair any damage caused by project activities local infrastructure ▪ Observe strict compliance with PPL HSE guidelines ▪ Project staff to respect cultural norms ▪ Provide offsets from sites of religious, cultural or Archaeological significance
		Disturbance to wildlife				✓		H	M	M	▪ Prohibit hunting or harassment of wildlife ▪ Avoid disturbance to live bird nests, reptile and small mammal holes during project activity ▪ A minimum distance of 50 m to be maintained from surface water bodies ▪ Maintain compressors and vehicles in good condition

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
		Noise and vibration					✓	H	M	H	▪ Minimize the use of horns by project vehicles ▪ The use of pressure horns will not be allowed ▪ Restrict movement of all project vehicles and personnel within work areas
		Dust/exhaust Emissions	✓					M	M	H	▪ Maintain vehicles in good condition ▪ Minimize dust emissions by good management practices ▪ Regulate vehicle speeds
		Soil contamination			✓			L	M	M	▪ No solid waste will be disposed of in the field ▪ Regularly check vehicle for fuel and oil leaks ▪ Use dedicated vehicle for fuel and oil transfer ▪ The soil contaminated from minor and moderate spills will be removed disposed of properly.
		Loss of vegetation				✓		L	L	L	▪ Avoid cutting of trees ▪ Prohibit use of local vegetation as fuel ▪ Contain crew personnel within work areas (corridor of 3m)
		Resource depletion					✓	M	L	M	▪ Prohibit use of water from surface water resources ▪ Employ prudent water conservation measures ▪ Keep complete records of water consumption during project ▪ Obtain water required for construction operation from local wells, existing or new PPL water wells in the area ▪ Install (if required) new water wells 300 m from existing local wells

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Water from a local well will only be used after ensuring that the available capacity at the tube well (safe yield minus local demand) is at least 50% greater than the project demand. ▪ Pay proper compensation for water abstraction from local wells
		Soil erosion			✓			L	M	M	▪ Maintain photographic records of all activities to monitor any changes in soil conditions ▪ Regulate vehicle speeds ▪ Prohibit off-road travel ▪ Train drivers on mitigation measures related to off-road travel and speeds limits
7.	Waste management	Air, soil and water contamination	✓	✓	✓		✓	M	H	M	▪ Dispose sewage generated at the campsite in septic systems comprising septic tanks and soak pits ▪ Dispose wastewater from laundry, kitchen washings, and showers into separate soak pits Build soak pits in absorbent soil ▪ Construct soak pits to prevent surface runoff entry ▪ Design soak pits to accommodate wastewater generated during the total duration of the operation ▪ In case the soak pits get filled during the operation, grey water will be sprinkled over access tracks ▪ No solid waste will be disposed of in the field ▪ Recycle non-combustible waste ▪ Wash vehicles in designated areas within campsite

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Check vehicles for fuel or oil leaks ▪ All fuel and oil storage areas will have a concrete pad underneath to prevent soil contamination in case of leaks or spills ▪ All fuel tanks will be properly marked to highlight their contents ▪ Fuel and oil storage areas will have secondary containment in the form of concrete or brick masonry bunds ▪ Use dedicated vehicles for fuel and oil transfer operations
8.	Community issues	Public grievances					✓	M	M	M	▪ Manage and maintain a community complaints register ▪ Disburse compensation amounts in an equitable and transparent manner ▪ Pay compensation amounts as soon as possible ▪ Settle compensation amounts based on prevailing market rates ▪ Comply with all IEE mitigation related to waste, noise and dust emissions ▪ PPL and its contractors will employ local residents during the project activities ▪ Ensure equitable and transparent recruitment of local labor ▪ Local residents living closest to the project location will be given priority in the employment process ▪ Local sources of water will be used only after complying with relevant requirements of the IEE ▪ Repair any damage caused by project local infrastructure ▪ Strict compliance will be observed to PPL HSE guidelines

Table 6.4: Environmental Aspect & Impact Identification Register

No.	Environmental Aspect	Description of Impact	Areas of Environmental Impact					Assessment of Significance			Management Program
			Air	Water	Land	Flora & Fauna	People/amenity/ heritage/ cultural / archaeological	Consequence	Likelihood/ Frequency	Significance	
											▪ Train drivers in responsible and safe driving practices ▪ Inform local communities about the progress of various project activities ▪ PPL representatives to maintain communication channels with local spiritual leaders and community elders ▪ Respect cultural norms ▪ Provide appropriate offsets from sites of religious, cultural or archaeological significance
9.	General							M	L	M	▪ Restore soak pits after project completion ▪ Ensure that after restoration activities the campsite is clean and that no refuse has been left behind ▪ Remove all concrete structures

6.8 Mitigation Management Matrix

Mitigation Management Matrix have been provided in this Environmental Management Plan (table 6.11). The Mitigation Management Matrix will be used as a management and monitoring tool for implementation of the mitigation measures. The matrix lists down the following.

- The mitigation measures recommended in the IEE;
- The person/organization directly responsible for adhering to or executing the required mitigation measures;
- The parameters which will be monitored to ensure compliance with the mitigation measures; and
- The timing at which the mitigation or monitoring has to be carried out.

It is highlighted that although responsibilities for executing and monitoring mitigation measures have been delegated to different persons/organizations, PPL will hold the primary and overall responsibility for ensuring full implementation of the EMP.

6.9 Monitoring

The HSE Advisor will monitor the activities of drilling operations while working in the project area. He will keep a record of all non-conformances observed and report these along with actions to PPL management for further action. The monitor will also report any impacts anticipated along with his recommendations for further action. The DC will take account of any recommendations relating to the operation arising during the monitoring.

A tentative frequency at which mitigation measures specified in the IEE will be monitored by HSE Advisor is provided as follows:

Table 6.5: Tentative Frequency of Monitoring Mitigation Measures	
Waste Disposal	
Camp Sites	Once a week as a minimum
Access Tracks and Road Travel	Daily during routine field visits
Water Use	Once every week
Recycling Contractors	At the time of approval and then once during the operation
Vehicles	
Field Inspections	Daily during routine field visits or twice a week as a minimum
Camp Inspections	Once during camp construction
Handling of Fuels, Oils, and Chemicals	Twice a week during camp operation
General Controls	Daily during routine field visits
Restoration	During restoration

Table 6.5(b): Environmental Monitoring Plan

S. No.	Monitoring Aspects	Monitoring locations	Parameters	Frequency	Responsibility	Documentation
1	Ambient air Quality Monitoring	Survey site, camp site surrounding	CO, NO, NO_2, SO_2, PM	Once during the project	Contractor	Laboratory test Reports
2	Exhaust and Emissions Monitoring	Vehicles, Generators, Fuel operated Machinery	Smoke, CO, Noise	Once during the project	Contractor	Laboratory test Reports
3	Waste water	Campsite	Effluent Flow, Temperature, pH, COD, BOD_5,TSS, TDS, Oil & Grease, Chloride and Phenolic Compounds	Once during the project	Contractor	Laboratory test Reports
4	Solid Waste	Project site	Solid waste collection, storage, transportation and disposal	During routine monitoring	Contractor	Complete record
5	Drilling Mud	Drilling Site	Collection, storage, transportation and disposal	During routine monitoring	Contractor / EHS Monitor	Complete record
6	Occupational Safety	Survey sites, campsite, project roads	HSE Records, Incidents and injuries	During routine monitoring	Contractor	Record of observations.

Table 6.6: Classification of Non-Compliances Impact on the Environment		
Classification	**Explanation**	**Example**
A	The action put the environment at risk of minor damage but did not cause any damage	Transferring fuel without drip tray
B	The action put the environment at risk of significant damage but did not cause any damage	Handling over large quantity (say, more than 400 liters) of used oil to unapproved contractor
C	Damaged the environment but to an extent that will naturally heal within a time period that is of the order of the life of the project	Damage to a few plants
D	Damaged the environment but the damage can be almost completely restored by remedial actions	Minor oil spills and stains
E	Damaged the environment but the damage can only be partially restored by remedial measures	Larger oil spills, for example those categorized as 'Moderate' in which the oil has penetrated deeply in the soil and the restoration occurs at the cost of loss of a significant quantity of top soil.
F	Damaged the environment that cannot be restored and may require alternate compensation	Killing a wild animal

6.10 Worker's health and safety plan

A good workplace safety plan is a comprehensive description of how the company works to create a safe working environment. A good workplace safety plan must have essential elements such as commitment shown by company; monitoring of company equipment, work conditions and employee's behavior in workplace; an escape plan which should include escape routes; and regulatory compliance of federal and provincial laws etc. The plan should give equal importance to other issues such as; communication; active participation; organization's clarity and transparency; organizational safety committee; minimum standard; and accident insurance.

A typical Health and Safety plan is mentioned along with mitigation measures and best management practices as shown in Table 6.6. The Plan should be implemented to ensure that no significant adverse worker's health and safety issues arise from activities associated with the Project. The Plan will apply to all PPL personnel, employees and contractors for the project. The plan is based on the following objectives:

- To identify the specific stress factors in work;
- To find out strategies for the reduction, prevention and cures for such stress factors;
- To identify corresponding measures to improve health and safety in workplaces;

- To make available the gathered knowledge to other organizations and thereby make a contribution to the successful work with and for multicultural and marginalized clients and in multicultural work teams;
- Preparation of training manual, conflict resolution for staff and others;
- Arrange availability of appropriate emergency response, rescue and first-aid personnel and services.

Table 6.7: Worker's Health and Safety Plan

Aspects	Safety Guidelines
Statement of commitment from management	A clear and written statement from management concerning the health and well-being of all staff is the first important component of any OHS plan. It indicates to employees that health and safety is a major priority within the organization.
Activities for achieving these goals	A number of activities (which would be mentioned further below) through which these objectives can be realized would be another important component.
Workplace health & safety committee	An occupational health and safety committee is a forum for cooperative involvement of employees representing both labor and management which assists in bringing the responsibility system into practice. Committee can be more effective in resolving OHS problems than a single individual.
Safe and effective work practices	• Rules should be specific to health safety concerns in the workplace; • Occupational health and safety committee should participate in the formulation of rules; • Rules should be stated in clearly understandable terms; • The reasons for the rule should be explained; • Rules must be enforceable, since disregard for one rule will lead to disregard for others; • Rules should be available to all employees in written form, in the languages understandable to employees; and • Rules should be periodically reviewed to evaluate effectiveness and to make changes for improved effectiveness.
Training	All employees should be trained for the work they carry out and be familiar with the safe operating procedures (SOPs) and guidelines of the use of equipment and tools.
Tracking System	Develop a tracking system to record where employees are working each day.
Emergency Response Plan (ERP)	All crew members should acquire induction on ERPs that address site specific risks and hazards and potential injuries associated with specific job.
Personal Protective Equipment (PPEs)	• Required PPEs will vary depending on the risks and hazards of type of drilling procedures and the terrain; • Safety glasses are required. It is usually advisable to wear high visibility vests; and • Hearing protection may be required (e.g., when using a chainsaw). Wear gloves to protect hands from cuts and infections.
Foot Wear	• Wear leather boots that provide good ankle support and grip appropriate for the terrain;

Table 6.7: Worker's Health and Safety Plan	
Aspects	Safety Guidelines
	• It is advisable to wear waterproof boots when working in extremely wet areas and heavy, insulating boots during very cold weather; and • As stable footing is very important, appropriate high quality boots may be considered as PPE by some companies.
Fire Risks	• Carry appropriate fire extinguishing equipment, including: a fire extinguisher, extinguishing powder, water and/or a small shovel when using gasoline powered machinery (e.g., chainsaws, generators, brush cutters, power augers); and • Keep the exhaust area clear of vegetation and place hot machinery on bare rock so it will not start a fire. Always observe fire bans.
Wild Animals and insects	• Where wild animals are a hazard, be trained in wild animal safety procedures and carry appropriate deterrents; • Be aware of potential fauna at ground level. Watch out for signs of bees or wasps which often build nests in the ground; • Do not place your hands where they might be bitten by a venomous snake or stung by scorpions or insects; • When working in insect infested areas and using insect repellent, avoid applying it to your eyes and mouth; • Do not overuse repellent as it is absorbed through the skin; • Be vigilant when wearing head nets as they restrict your range of vision; and • Follow medical advice regarding the use of anti-malarial medications and avoid mosquito bites when working where malaria and other serious insect-borne diseases are present.
Audio entertainment equipment	• In general, it is not good practice to allow employees to wear personal electronic music devices with headphones or earplugs while working; and • Headphones or earplugs interfere with the ability to clearly hear directions via radio communication, noise due to machine malfunctions and dangerous wildlife, etc.
Drilling	• Employees who carry out drilling should be competent and fully trained; • Wear appropriate PPE when using tools and equipment, which may include ear protection from noise as well as eye protection, good footwear and high visibility vests; • Should be trained to face any emergency that may occur during drilling.
Activity Completion	• When an activity is completed, remove all equipment, including wires. Fill in holes if they present a future tripping hazard to workers or to animals; • Care should be taken in dismantling of industrial components and transporting large equipment.

COVID-19 Pandemic, Control and Prevention Measures at PPL's Sites

PPL's Management is continuously monitoring COVID-19 situation and proactively implementing preventive measures since the start of pandemic, at its Fields and Offices which are equally applicable to all workforce including contractors working at PPL location irrespective of the contractor's workforce strength, nature of work, duration of stay etc. Nevertheless, in these challenging circumstances, PPL remains strongly committed to

ensure interrupted gas supply to meet country's energy demand while protecting safety and wellbeing of the entire workforce during the COVID-19 pandemic.

The implemented COVID-19 precautionary measures at all PPL locations are in line with the Govt. of Pakistan SOPs, W.H.O and Ministry of Energy advisories. The implemented measures are regularly reviewed and enhanced as per the updated SOPs / guidelines and COVID-19 situation on ground.

Some of the key precautionary measures implemented at PPL are summarized below:

1. Staff Visiting PPL Office/ Fields

- PPL employees Work From home except those who are essentially required at office for some critical task. All employees/ contractors staff visiting PPL offices for essential tasks are required to evaluate their own health as per Self-Assessment Questionnaire. However, if any staff if having any of the COVID-19 symptoms is restricted to enter PPL Offices.
- Field based officer's rotation cycle extended from 21 to 42 days to minimize local transmission and transport risks. All employees, contractors and drivers engaged are medically screened remotely before initiating their journey to PPL fields/ locations to ensure they are not affected by COVID-19. They also undergo physical medical examination upon arrival. Vehicles utilized for movements are also disinfected pre & post trip under well-defined journey management protocols.
- Any Staff (PPL employee/ Contractor) working at PPL field locations/ offices who develop upper respiratory tract infection such as fever and cough must report their condition to company doctor.
- Visits / engagement of other PPL Office staff / Contractors / Visitors at locations are deferred unless the requirement is operationally urgent and required to maintain continuity of operations

2. General Precautionary Measures Implemented

- Temperature screening (for fever) and use of Face Mask is mandatory for all entrants also while visiting any common areas.
- Staff's whose workstation is in close vicinity to other staff's workstation i.e. < 6 ft shall be mandatorily required to use Face Mask even on the workstation if unable to get the workstation relocated
- Cough / sneeze into tissue paper or in elbow instead of openly in air, followed by washing / sanitizing hands
- Promote ventilation in the office areas by allowing entry of fresh air
- Maintain social distance of 6 ft during the conversations and 3 ft in a queue while hand shaking, and crowding is strictly prohibited
- Hold meetings and discussions through telephone and MS Teams. Only under unavoidable circumstances meetings may be held in rooms while maintaining at least 6 ft distance (in all directions) between participants and all participants must wear Face Mask throughout the meeting
- Hand washing or Sanitizing hands before moving to the workstations each time and frequently wash / sanitize hands throughout the day by following WHO handwashing technique. Avoid touching Eyes, Nose and Mouth

- Social distancing and ventilation requirements in the dining areas at sites however dining facilities are remained closed at PPL offices
- All non-essential movements in the office premises or in field's operation areas during and after duty time are restricted, moreover recreational areas and TV lounges remain closed
- Strictly compliance of road transportation requisites as per Field Staff Changeover Protocol
- Smoking is only permitted in the designated areas while maintaining social distance > 6 ft with other smokers. Smoking makes you more vulnerable to contracting COVID-19
- Regular cleaning and disinfecting the commonly touched surfaces such as doorknobs, handles, tables etc.

3. Implementation Strategies

PPL top management overlooks the conditions and decides the way forward and strategy by the help of Crisis Management Team (CMT) which is further assisted by COVID-19 Workgroup at Corporate Level, however Site Emergency Response is supported by the Vigilance Teams established at fields to implement Corporate Advisories, develop Site Specific guidelines and to monitor the compliance of COVID-19 precautionary measures

- Need based Implementation Review Audit at PPL Fields/ Locations
- Awareness on COVID-19 precautionary measures through online sessions or physically while using face masks and maintaining social distancing. Relevant information and guidelines are disseminated through e-mails, banners, and posters at prominent locations.
- Disciplinary actions as per the Company's Code of Conduct against non-compliance of the COVID protective measures by any staff member

4. Prominent SOPs/ Protocols issued at Corporate Level

i. Corona Virus Corporate Advisory

ii. Food Safety and Kitchen Hygiene

iii. Advisory for Contractors engaged with PPL

iv. Protocol for Field Staff Rota Changeover

v. Protocol for Management of Suspected COVID-19 Case at PPL Sites

vi. Protocol for Preventive measures and Management of COVID-19 Case at PPL Offices

6.11 Waste Management

Sources of Wastes

The main sources of wastes at field locations are engineering & construction specified; drilling specified; camps specified; and maintenance activities specified. Waste is classified as Hazardous and Non-hazardous by identifying the physical, chemical and toxicological properties. A system to categorize waste streams according to their health and

environmental hazards is then developed. Designated drums, containers, bins etc. with specific labels are placed as Collection Methods for the Wastes Generating Areas. Color coding of drums, containers, bins etc. for various type of wastes is done.

Waste Management Methods

There are different capabilities and limitations of different Waste Management Options for the various types of wastes generated in order to make it cost-effective Waste Management Decisions that are protective of human health and the environment. As a general matter, a Waste Management Hierarchy (as recommended by EPA) should be adopted, with a preference for reuse and recycling options.

These methods would apply to atmospheric emissions, chemical wastes, contaminated soil from oil / fuel spills, drilling pit waste, drums/containers, garbage (inert solid wastes); pit, tank and vessel bottom wastes; process drainage wastes system; sanitary; clinical; produced water; and, rainwater drainage etc.

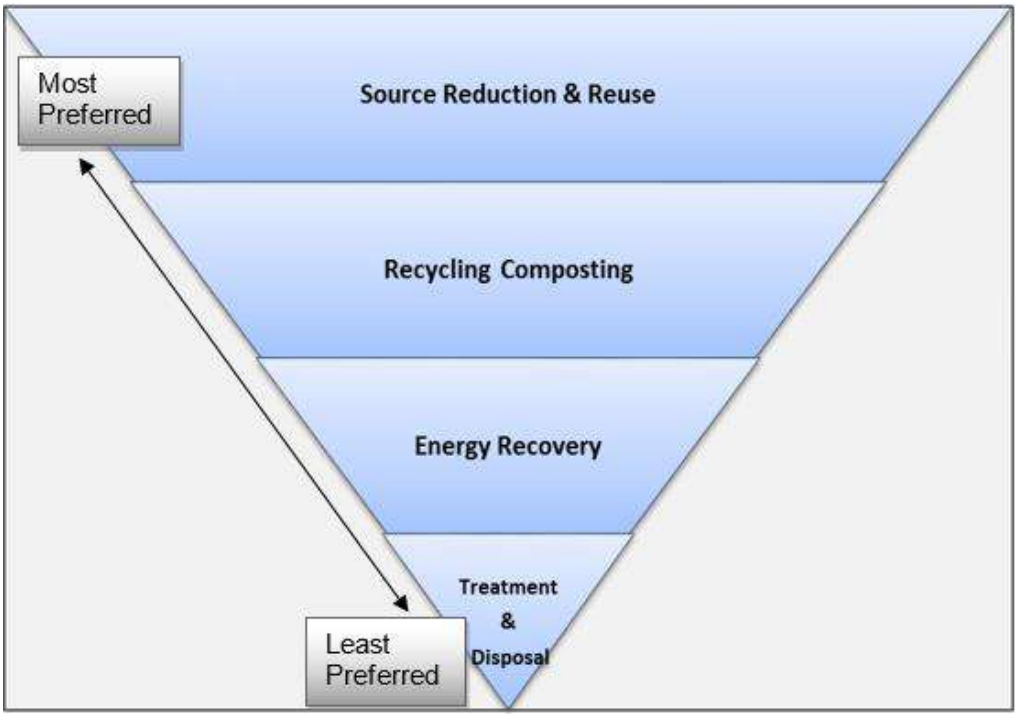

Table 6.8: Waste Disposal Summary During Exploratory Drilling

Type of Waste	Description	Operational Phase	Disposal/Mitigation Measures
Food waste	Animal, fruit or vegetable residues	Construction and drilling	Buried in a pit to mix with soil for natural decomposition and backfilled with fresh soil.
Packaging waste	Paper, plastic, textiles, cardboard, rubber, wood, glass, tin cans, aluminum cans	Construction and drilling	Recyclable wastes will be provided to a certified recycling contractor
Medical waste	Syringes, glass bottles, soiled	Construction and drilling	Provided to a certified recycling contractor.

Table 6.8: Waste Disposal Summary During Exploratory Drilling

Type of Waste	Description	Operational Phase	Disposal/Mitigation Measures
	bandages, expired drugs, dressings		
Workshop waste	Used oil, ferrous/non-ferrous materials, batteries, oil	Construction and drilling	Provided to a certified recycling contractor.
Sewage and gray wastewater	Wastewater from kitchen and washing areas, sewage	Construction and drilling	Sewage will be disposed of using septic tanks and soak pits. Waste water from kitchen and washing areas will be disposed of in a soak pits. The solid residue from the septic tank will be properly disposed of.
Well-testing waste	Formation water	Well testing	Stored in the lined waste pit at the well site. Further disposal by evaporation in the pit and backfilling of a pit after treatment of soil residue, if required.
Completion waste	Completion fluid	Completion	Prior to disposal, waste fluids will be tested for NEQS compliance. If they are found to conform to NEQS, the fluids will be used as a dust suppressant on the access track and at the well and campsites. If not, then PPL will evaluate other options of disposal, such as evaporation inside lined pits.
Oil spills/soil contaminated by oil leakages or spills	Contaminated soil	All phases	Soil contaminated by minor spills/leakages (defined as leaks from vehicles, machinery, equipment or storage containers such that the area and depth of soil contaminated is less than 1 sq. ft. and 3 inches, respectively) will be handed over to a certified waste handler for proper disposal. Moderate spills, defined as spills of a volume less than or equal to 200 liters, will be contained and controlled using shovels, sands, and native soil. The equipment and materials will be made available at campsites and during the operation. The contaminated soil will be excavated and stored in a bonded area lined with an impermeable base. The contaminated soil will be disposed of through recycling. Major

Table 6.8: Waste Disposal Summary During Exploratory Drilling			
Type of Waste	**Description**	**Operational Phase**	**Disposal/Mitigation Measures**
			spill of volumes much greater than 200 liters will require the initiation of Emergency Response Procedures. These spills will be handed and will require proper treatment

6.12 Equipment Maintenance

Equipment shall be maintained by the probable contractor as per Original Equipment Manufacturer (OEM) Manual. Regular emission monitoring shall be carried out throughout the project period. The environmental safeguarding is included in the overall cost of the project awarded to the contractor. The management of equipment maintenance details at the project site will based on:

- Early detection
- Immediate reaction
- Confinement of maintenance area
- Application of the adequate response procedure
- Follow-up and monitoring of maintenance

6.13 Emergency Response Plan

Contingency planning requires those emergency plans and procedures that can be put into action quickly as soon as unexpected events occur. Poor contingency planning can result in delayed or ineffective response to unexpected events. In turn, this delay could result in short-term and long-term environmental impacts and threats to public safety and convenience.

Possible emergency situations during drilling operations include:

- Well blowout;
- Possible risks arising from operational conditions or human error that could result in accidents, such as:
  - Uncontrolled material leak into the atmosphere.
  - Fire/explosions.
  - Occupational accidents (serious or fatal), due to product contamination, failure to comply with operating rules and procedures, negligence of the personnel, falls, onsite accidents caused by equipment, burns, inappropriate use of equipment and personal protection items.
  - Environmental Contamination (due to material leaks into the environment, product spills on land). Spillage of fuel, oil, gas, chemicals and hazardous materials;
- Natural Risks that may affect the facilities and their resulting damage to property and the person (Earthquake, Typhoon/Cyclone, Lightening etc.)
- External Risks arising from delinquent actions, terrorism, or vandalism.

Emergency situations are possible even with proper planning, design and implementation of correct procedures and personnel training. For the same reason, PPL has established procedures to respond to various emergency scenarios with respect to its range of activities like drilling activities. Emergency response management will be ensured by a team of PPL staff (the control committee) who in turn will direct all response activities through the Emergency response unit, communications, public relations, and safety and environmental affairs. Each of these departments will have specific responsibilities to perform in the event of an emergency.

6.13.1 Emergency Budget

It is recommended that to protect the environment and to ensure strict implementation of mitigation measures a certain amount of budget should be allocated. It is proposed that 2 to 5% of the project cost shall be dedicated for environment protection.

6.13.2 Risk Management

The management of emergency situations at the project site will based on:

- Early detection
- Immediate reaction
- Confinement of emergency area
- Application of the adequate response procedure
- Follow-up and monitoring

1. Initial response

Initial response is always the most important aspect and can determine the success or failure of emergency response management. In the event of an emergency (oil spill, fire, natural disaster e.g. rainstorms, earthquake etc.) following steps are recommended for the emergency response team/supervisor.

- Seize all operations
- Inform the respective authority about the incident
- Seek medical attention if required
- Assess the situation and take action according to the instructions received from the Emergency Response Team leader

2. Site Evacuation

The following notification system will be used to notify the need for evacuation:

- Alarms/Horns/Sirens.
- Verbal Public address system.

Table 6.9: Emergency contact details

Emergency Contacts	Phone No	Address
Fire/Police/Ambulance		

Table 6.9: Emergency contact details		
Emergency Contacts	**Phone No**	**Address**
Office of Emergency Services		
National Response Centre		
Post-Incident Contacts		
Fire Department		
Occupational Safety and Health Department		
Emergency Resources		
Nearest Hospital		

3. Emergency Equipment

Arrangement of following emergency equipment will be considered:

Table 6.10: List of emergency equipment			
Equipment Category	Equipment Type	Location	Description
Personal Protective Equipment, Safety, & First Aid Equipment	▪ Self-Contained Breathing Apparatuses (SCBA) ▪ Protective Aprons/Coats ▪ Protective Boots ▪ Protective Gloves ▪ First Aid Kits ▪ Hard Hats ▪ Safety Glasses / Splash Goggles ▪ Other (describe)		
Fire Extinguishing Systems	▪ Fire Alarm ▪ Fire Extinguisher Systems (describe)		
Additional Equipment			

4. Training

All employees will be trained appropriately to work on ERP effectively. Employees training will provide workers with information on minimizing the damage to life and property. The HSE officer will determine the training requirements in consultation with senior project management:

The staff will be trained as per following procedures:

i. Personnel Training Procedures

- Notification
- Emergency incident reporting
- Description of the Emergency event

ii. Emergency Response Team members are capable of and engaged in the following:

- Personnel rescue procedures
- Shutdown of operations
- Use, maintenance, and replacement of emergency response equipment

iii. Emergency Response Training

- Develop and practice a spill clean-up procedure including where to find emergency equipment and how to use it.
- Make sure all people on site are aware of emergency telephone numbers to call in the case of a large spill. Spill kit equipment on site should include: booms to contain liquids, material to prevent spills into drains, and material to absorb spills. Keep this absorbent material in a clearly labeled and easily accessible place.

iv. Response Strategy

Upon the occurrence of an emergency, the Plan will be developed under the following conditions:

- First Stage: Notification.
- Second Stage: Initial assistance/rescue.
- Third Stage: Response operations.
- Fourth Stage: Evaluation of the Plan and damages.

Onsite staff will be notified of the emergency event. Furthermore, message forms will be established to record at least the following information: Name of informant, location and place of the emergency, number of people affected and, if possible, an estimate of the type of injuries and/or damages, among others.

5. Monitoring and Review

Monitoring of different activities will be required to analyze the impacts of drilling operations on the environment. EHS officer will be the in charge of monitoring procedures. Monitoring techniques will be identified and the frequency of selected parameters for monitoring will be followed. Manager HSE will keep a record of all non-conformities observed and report them to the senior management in HSEQ for further action. Manager EHS will also report any impact anticipated along with his recommendations for further action. The contractor shall take note of the recommendations relating to issues arising during monitoring of construction activities.

6.14 Site Restoration Plan

The following activities will be carried out during site restoration:

- Demobilization of all equipment and machinery;
- Disposal of waste material;
- Backfilling of all soak pits and septic tanks;

- Dismantling and removal of fence or barriers surrounding the camp area;
- General restoration of the site area including landscaping and restoration of drainage where required.

After completion of the drilling and testing operations, the rig will be dismantled and demobilized off the site. The wellhead will remain in situ, but all other equipment and materials including empty drums used and unused chemicals, fuels and lubricants will be removed from the well site by their respective suppliers.

After well evaluation, a decision on whether to abandon or further develop the well will be taken. If it is decided that the well is to be abandoned, the site will be restored, as far as possible, to its original condition. Any concrete structure built during the project will be removed (if no longer useful), fencing will be removed, and the area will be leveled. All pits will be backfilled.

Drill cuttings will be disposed of within the lined cuttings pit at the well site. Drilling mud and other liquids will be allowed to evaporate inside the lined pit after which the pits will be backfilled. The access roads may be left intact for local use.

6.15 Change Management Plan

6.15.1 Change in Operations

Any change in the project design or project operation if required, will be made in relevance to the EMP and all the impacts associated with changed process will be either similar to the existing impacts and if different, will be assessed and included in the mitigation management plan. This has, on the basis of nature of process change, been distributed into three categories.

6.15.2 First-Order Change

Change leading to a significant removal of any operation from the project described in the chapter on description of project of this report and consequently requires a reassessment of the environmental impacts associated with the changes. In such an instance, updated environmental impacts of the proposed change will be sent to EPA for approval.

6.15.3 Second-Order Change

Change that entails project activities not significantly different from those described in the IEE report, and which may result in project impacts whose overall magnitude would be similar to the assessment made in this report. In case of such changes, the environmental impacts of the activity will be reassessed. Additional mitigation measures if required will be identified and documented for being reported to EPA for their record.

6.15.4 Third-Order Change

Change that is of little consequence to the IEE findings. This type of change does not result in impact levels exceeding those already assessed in the IEE report; rather these may be made onsite to minimize the impact of an activity. The only action required in this regard will be to record the details of process change in the record register.

6.15.5 Change in Record Register

A record register will be maintained at project site at the start of project activities. All the changes to be made will be recorded in this register. This will assist in the step-by-step environmental monitoring and decision-making. Record register will be the responsibility of EHS department, and will be used internally.

6.15.6 Change in EMP

Changes in project design necessitate changes in the EMP. In this case, following actions will be taken:

- A meeting will be held between project management and contractor, to discuss and agree upon the proposed change to the EMP.
- Based on the discussion during the meeting, a report will be produced, which will include the additional EMP clauses and the reasons for their addition.
- Additional EMP clauses will be added to the original EMP as a second volume which will be distributed to the relevant project personnel and contractor.

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
1. Changes in Landscape and Soil Erosion.				
1.1	Well site and campsite areas will be kept to a minimum.	PPL	Check compliance	After marking of the site layout on ground by the CC and prior to clearing of land at these areas.
1.2	The construction of well sites and campsites on leveled land to minimize disturbance to soils and landscape	PPL	Location of camp site and well site in level areas.	Prior to site layout in ground
1.3	Existing access roads will be used as much as possible. Development of new track lengths will be avoided as much as possible	CC	Monitor off road travel and record non-compliances. Development & marking of access track during construction	During construction
1.4	The width of the improved track will be kept at 5 m, except at bends where safety considerations will dictate additional width.	CC	Randomly check the width of the improved access track	During construction
1.5	The access track will be properly compacted at the time of construction and thereafter properly maintained by watering and compaction (where required) throughout the entire construction and drilling operation.	CC	Check compliance	Compaction during construction, dust emissions and loose sections of the track for the entire period of use of the track for this operation
1.6	Off-road travel will be strictly prohibited and observance of this will be monitored during the operation.	CC, DC, PPL	Advise all personnel, address any staff complaints and ban off road travel	During the entire operation
1.7	Vehicle speeds will be regulated and monitored to avoid excessive dust emissions.	CC, DC, PPL	Set speed limits, train drivers and monitor non-compliances	During the entire operation
1.8	Areas along the access track, well site and campsites will be visually monitored and any area showing signs of soil erosion will be watered and compacted.	CC	Check compliance	During drilling activities
1.9	Cutting of vegetation will be kept to the minimum required. Unnecessary clearing within the corridors along the access track or on the periphery of the well site and campsites will be avoided.	CC	Monitor land clearing activities	During construction

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
1.10	Movement of construction equipment will be restricted to work areas only to avoid unnecessary disturbance to soils in the project area.	CC	Monitor movement of vehicles and off road travel	During Construction activity
1.11	When tracks are to be used for obtaining water from water wells, the tracks will be regularly sprinkled with water for dust suppression (where required).	CC	Sprinkling of water on access track to water wells	During the entire operation
1.12	During construction, a single track will be identified and approved along sections of the main track on which work is in progress. Vehicles will be allowed to travel only on the approved track.	CC	Check compliance	During Construction
1.13	Dumping of gravel on or close to the access track being improved or constructed will not be allowed	CC	Gravel or sand dumping on access track	During Construction
1.14	Periodic trainings will be provided to drivers on mitigation measures related to off road travel and speeds limits.	PPL, CC,	Check training log, provide trainings	During the entire project
2. Contamination of Soil and Water				
2.1	Approvals to start construction or drilling will only be given by PPL HSEA after ensuring that all waste management facilities (waste segregation units, soak pits, septic tanks etc.), equipment (waste bins, drip pans, tarpaulins etc.) and procedures (approvals for waste contractors etc.), prescribed in the IEE are in a state acceptable to the PPL QHSE.	CC, DC, PPL	Approval for waste contractor , waste management systems and start of work	Before construction and drilling activity
2.2	Food waste and combustible packaging wastes that have no re-use will be stored temporarily onsite within designated waste segregation areas and will be handed over to third party contractor.	CC, DC	Provision of sufficient waste bins, segregation of waste, disposal through third party contractor.	During the entire operation
2.3	Dedicated waste segregation units / containers will be built or placed at campsites and well site.	CC, DC	Construction and monitoring of waste segregation units	During entire project
2.4	Recyclable wastes including glass, tins, and metal scrap will be handed over to recycling contractors by PPL HSEA.	CC, DC	PPL HSEA to approve waste contractors. Monitor waste	During the entire operation

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
			segregation and safe transportation to the recycling contractor's facility	
2.5	Waste oil will be provided to contractors approved by the PPL HSEA.	CC, DC	PPL HSEA to approve waste contractor and monitor safe transportation of the waste oil	During the entire operation
2.6	Medical wastes will temporarily be stored onsite separately and incinerated at a suitable location through waste contractor approved by PPL HSEA.	CC, DC	PPL HSEA to approve disposal arrangement. Monitor waste segregation and safe storage onsite	During the entire operation
2.7	Wastes will not be disposed of in the open area.	CC, DC	Monitor during routine visits	During the entire operation
2.8	Adequate number of waste bins will be provided for collection of wastes at the well site and campsites.	CC, DC	Monitor provision of sufficient waste bins	During the entire operation
2.9	Grey wastewater will be collected in soak pits. The wastewater, if found to meet the NEQS could be sprinkled over the access road. Alternatively it will be transferred from the site in tankers and disposed of into municipal drains in the nearest major city	CC, DC	Check provision of soak pits and quality of waste water. Monitor sprinkling of wastewater	During the entire operation
2.10	Sewage generated from the toilets will be collected and treated in septic tanks. The septic tanks will be built of concrete and brick masonry to avoid leaching of wastewater from the tanks. PPECPCA guidelines will be followed in handling the sewage.	CC, DC	Check provision of septic tank and soak pit. Monitor wastewater levels in the soak pits.	During the entire operation
2.11	Soak pits will be built in absorbent soil and located 300 m away from a perennial surface water source or ground water well.	CC	Check soil condition and distance between the soak pits and the nearest water bodies	During design and construction
2.12	Soak pits will be covered and constructed such that surface runoff cannot enter the pits.	CC, DC	Monitor provision of covers and berms	Provision of berms during construction and proper covers during the entire operation
2.13	Soil contaminated by minor spills/leakages (defined as leaks from vehicles, machinery, equipment or storage containers such that the area and depth of soil contaminated is less than 1 sq. ft	CC, DC	Monitor any oil leaks and contamination of soil	During the entire operation

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
	and 3 inches respectively) will be scraped and disposed of through re-cycling.			
2.14	Moderate spills defined as spills of volume less than or equal to 200 liters will be contained and controlled using shovels, sands and native soil. These equipment and materials will be made available at camp sites and well site during the operation. The contaminated soil will be excavated and stored in a bounded area lined with an impermeable base. Depending on the volume, the contaminated soil will be either disposed of through re-cycling.	CC, DC	Ensure provision of equipment and material to control and handle such spills on site. Monitor disposal as per the requirements of the IEE	During the entire operation
2.15	Major spills (defined in the IEE as spills of volume much greater than 200 liters) will require initiation of PPL's Emergency Response Procedures. These spills will be handled and controlled according to the measures listed in PPL's Oil Spill Contingency Plan and will require special treatment such as incineration.	PPL, CC, DC	Ensure that PPL Emergency Response Procedures and Oil Spill Contingency Plan are available onsite. Ensure appropriate response is initiated at the time of such incident. PPL HSEA to check that the plan is understood by all key personnel	During the entire operation
2.16	All fuel and oil storage areas will have a concrete pad underneath to prevent soil contamination in case of leaks or spills.	CC, DC	Ensure provision of concrete pad	During construction activity
2.17	All fuel tanks will be properly marked to highlight their contents.	CC, DC	Ensure that proper signs are placed with the tanks	During the entire operation
2.18	Fuel and oil storage areas will have secondary containment in the form of concrete or brick masonry bunds. The volume of the containment area will be equal to at least 120% of the total volume of fuel or oil stored.	CC, DC	Check containment volume of the bounded area	At the time of construction
2.19	During fuel and oil transfer operations such as refueling, drips and spills will be avoided and drip pans will be used.	CC, DC	Ensure provision of drips pans, provide training on safe refueling practices, monitor oil or fuel stains	During the entire operation
2.20	Fuel tanks will be daily checked for leaks and all such leaks will be plugged immediately.	CC, DC	Inspect fuel tanks for leaks	During the entire operation

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
2.21	Shovels, plastic bags, and absorbent material will be present near fuel and oil storage or handling areas to attend spills and leaks.	CC, DC	Monitor presence of materials and equipment	During the entire operation
2.22	Vehicles will only be washed within designated areas within campsites. Mechanical maintenance works will be done only in workshops	CC, DC, PPL	Ensure provision of washing areas and maintenance workshops and monitor any non-compliances with the IEE requirement during routine monitoring	During the entire operation
2.23	Vehicles will be daily checked for fuel or oil leaks. Vehicles with leaks will not be operated until repaired.	CC, DC, PPL	Randomly inspect vehicles and designated parking areas	During the entire operation
2.24	Chemicals used during the drilling operation will be stored on brick masonry pads with periphery drains discharging into the waste pit.	CC	Ensure provision of brick masonry pads with drains	During construction activity
2.25	Produced formation fluids during testing will be disposed-of according the environmentally sound practice as specified by the Production Contractor.	Production Contractor	Check compliance	Prior to and during disposal of waste fluids
3. Deterioration of air quality				
3.1	Generators and vehicles used during the operation will be properly tuned and maintained to minimize air emissions	CC, DC	Check maintenance logs	During the entire operation
3.2	Well site and campsites will be located at least 500 m away from communities.	PPL , CC	Check distances of well site and camp site from communities	Prior to construction of well site and camp sites
3.3	Dust emissions due to road travel will be minimized by regulating vehicle speeds and watering of the access track	CC, DC	Set and monitor speed limits. Monitor sprinkling of access track	During the entire operation
3.4	Dust emissions during construction activities will be minimized by good management practices such as locating stock piles out of the wind direction, keeping the height of the stock piles to a minimum, keeping earthwork areas damp etc.	CC	Monitor dust emissions during earthworks. Train CC on good management practices	During the construction operation
3.5	During construction, leveling or widening along the access road will be done in sections, immediately followed by sprinkling of water and also preferably compaction (where required)	CC	Access road construction	During construction activity

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
3.6	Burning of waste and combustible material at site and in camp will not be allowed.	DC/PPL	Check compliance	During the construction and operation phase.
4. Noise Pollution				
4.1	It will be ensured that the generators, vehicles and other potentially noisy machinery used are in good condition.	CC, DC	Monitor noise levels	Prior to use of machinery and vehicles
4.2	Noise levels at communities nearest to the well site, camp site and access tracks will be monitored by Contractor. In case these are found to exceed safe acceptable limits appropriate mitigation will be taken.	PPL	Monitor noise levels	During Construction, Drilling and Operation
4.3	Well site and camp sites will be located 500 m away from nearest communities.	PPL, CC	Check distances from the community	Prior to construction of the well site and camp sites
4.4	The use of horns by project vehicles will be minimized. The use of pressure horns will not be allowed	CC, DC, PPL	Train drivers, check vehicles and record non-compliances	During the entire operation
4.5	Movement of all project vehicles and personnel will be restricted to within work areas.	CC, DC, PPL	Advise all drivers and investigate non-compliances from staff	During the entire operation
5. Use of Water				
5.1	Avoid abstraction of water from surface water resources	CC, DC	Check compliance	During the entire operation
5.2	The quantity of water used during construction and drilling will be kept to the minimum required by taking prudent water conservation measures on site. A complete record of water consumption will be maintained by the PPL	CC, DC	Monitor water consumption, advise water conservation measures	During the entire operation
6. Blockage of Natural Drainage				
6.1	Area around the well and camp site will be landscaped to avoid blocking natural drainage.	CC	Monitor landscaping and any obstruction caused to natural drainage	During the construction activity
6.2	Crossings will be provided at all stream crossings to avoid blocking of natural drainage. Pipe culverts will be provided at small drainage channels if any.	CC	Ensure construction of Fjord crossings and pipe culverts and randomly check along the access track	During construction of the access track

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
7. Site Restoration- Dry Well				
7.1	All equipment and machinery at the well site will be demobilized	DC	Check compliance	During site restoration
7.2	All wastes at the well site will be disposed of according to the requirements of the IEE.	DC	Check compliance	During site restoration
7.3	Re-vegetation and continued monitoring of the site after closure	CC,PPL	Check compliance	After site restoration
7.4	All concrete structures at the well site will be broken and either transported out of the project area by the site restoration contractors for sale or reuse or disposed of into the pits	CC	Check compliance	During site restoration
7.5	All pits at the well site will be backfilled	CC	Check compliance	During site restoration
7.6	The areas covered by the portion of the access track that will be of no use for other wells will be restored, in that all gravel topping will be removed. This scenario will be applicable only if the locals require the portions of the track to be restored or otherwise it will be left on the site on the consent of the locals	CC	Check compliance	During site restoration
8. Partial Restoration - Producing Well				
8.1	The well site and access roads will be retained to support well access work for further testing or during the development phase.	PPL	Check compliance	During site restoration
8.2	The outer chain link fence will be retained as a safety measure to keep wildlife away from the pit areas.	PPL	Check compliance	During site restoration
8.3	The wellhead will be enclosed by a locked steel cage. This will serve as both a safety and security measure as the site will be down-manned pending further development operations work.	PPL	Inspect well head is enclosed by locked steel cage	During site restoration
8.4	The constructed pit areas will be retained but all liquid and solid waste material will be removed from the site and disposed of in line with the requirements of this IEE.	PPL	Ensure that all liquid and solid waste is removed	During site restoration
9. Clearing of vegetation and loss of habitat				
9.1	Clearing of vegetation will be minimized by keeping the road width to 5 m (except at bends where greater width will be	CC	Check width	During the construction activity

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
	required for safety reasons), and by keeping the length of new sections of the road to a minimum.			
9.2	Off-road travel, required at sections of the road where construction work is in progress, will be minimized and if required will be allowed only after approval from PPL HSEA	CC, DC	Train drivers and investigate non-compliances	During the entire operation
9.3	During construction good management practices will be adopted to avoid disturbance to areas adjacent to work areas including the access track, well site and camp sites.	CC	Train construction supervisors, monitor construction activities	During construction operation
9.4	Well site and campsite areas will be kept to a minimum.	PPL, CC	Check compliance	After marking of the site layout on ground by the CC and prior to clearing of land at these areas.
9.5	Camp sites established for the purpose of construction will be located in existing clearing. Vegetation clearing from these sites will be kept to a minimum.	CC	Supervise camp setup	During setup of the construction camps
9.6	Cuttings of trees will be avoided. Compensatory trees will be planted in ratio of 4-7-10 depends upon the size canopy cutting.	CC	Supervise land clearing activities	During land clearing for the access track, well site and drilling camp site
9.7	Use of local vegetation as fuel will not be allowed.	CC	Check compliance	Use of local vegetation as fuel will not be allowed. CC Check compliance During the entire operation
10. Disturbance to Wildlife				
10.1	Prior to commencement of construction and drilling, awareness trainings will be provided to contractor's management and field crew on matters related to the wildlife protection.	PPL	Provide environmental awareness training	Before commencement of drilling activity
10.2	Land uptake by well site, camp sites and access road will be minimized	PPL, CC	Check compliance	After marking of the site layout on ground by the CC and prior to clearing of land at these areas.

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
10.3	The total duration of construction and drilling will be minimized by good management.	PPL	Check compliance	During the entire operation for the time specified
10.4	All mitigation measures to minimize noise levels, dust emissions, air emissions and waste management required by the IEE will be adhered to.	PPL	Check compliance	During the entire Project
10.5	Food wastes will not be disposed of in the open. Food wastes collected in waste segregation units will be disposed of according to waste disposal procedure on a regular and strict basis as advised by the PPL HSEA.	CC, DC	Monitor collection and disposal of food waste	During the entire operation
10.6	Construction work near areas which show small mammal and reptile populations will commence after a soft start up and will be randomly monitored.	CC	Check compliance	During construction activity
10.7	Vehicle speeds on access road will be controlled to avoid incidental mortalities of reptiles. Any such incident will be reported to the PPL HSEA. Vehicle speeds will be randomly checked.	PPL, DC, CC	Monitor speed limits	During the entire operation
10.8	Cutting of trees will be avoided	CC	Check compliance	During Construction activity
10.9	Movement of all project personnel will be restricted to work areas.	PPL, DC, CC	Check compliance	During entire project
10.10	Movement of project vehicles will be restricted only to the project access road or to routes approved by the PPL HSEA	PPL, DC, CC	Check compliance	During entire project
10.11	Night work during construction will be prohibited, night traveling will not be allowed unless absolutely necessary.	PPL, DC, CC	Check Compliance	During construction phase
10.12	All mitigation related to minimizing the noise will be adhered to.	PPL, DC, CC	Check compliance	During the entire project
10.13	Light used at the well site and camp site will be kept to the minimum requirement	DC, CC	Ensure that IEE requirements should meet	During the entire project
10.14	Hunting and trapping of wildlife will be prohibited.	PPL, DC, CC	Check compliance	During the entire operation

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
10.15	Feeding or harassment of wildlife will not be allowed	PPL, DC, CC	Check Compliance	During the entire operation
11. Socio-economic, archaeology and cultural Environment				
11.1	Local source of drinking water will not be exploited unless measures listed in water use mitigation measures are followed	PPL, DC, CC	Monitor adherence with the requirements	During the entire project
11.2	The access road will be watered regularly to minimize the dust emissions (if required).	PPL,CC,DC	Check aliment of access routes	During construction activity
11.3	Construction of bypass to all major settlements and where necessary rerouting the access road so that a safe distance is maintained from a settlement.	PPL, CC	Check alignment of access routes	During construction activity
11.4	Drivers will be trained in responsible and safe driving practices, a speed limit will be set and maintained; in addition, vehicle logbooks will be maintained and inspected for compliance.	PPL, DC, CC	Provide training and monitor compliance	During the entire operation
11.5	Labor from local communities will be recruited equitably amongst the various tribes, avenues for conflict resolution will be open, and the employment procedures will be transparent	PPL, DC, CC	Monitor adherence with the requirement and maintain record of labor	During the entire operation
11.6	Use of local firewood for cooking by contractor staff will be prohibited	DC, CC	Monitor adherence with the requirement	During the entire operation
11.7	The vehicle speed for traveling along the access road will be limited	PPL, CC, DC	Monitor speed limits	During the entire operation
11.8	The well site will be located at minimum distance of 500m from residential communities. Thereby mitigating the effect of noise and emissions.	PPL, CC	Check the alignment of access route	Before construction activity
11.9	Generators and vehicles will be regularly maintained to minimize emissions.	PPL, DC, CC	Monitor air emissions	During the entire operation
11.10	Any land acquired and distribution of compensation will be carried out transparently, in consultation with the local leaders and in accordance with the PPL compensation procedures.	PPL	Check compliance	During the entire operation

Table 6.11: Mitigation Management Matrix for Drilling Activities

No.	Impact and Mitigation Measures	Execution	Action/Monitoring Parameter / Monitoring Method	Timing
11.11	Project staff will respect cultural norms	PPL, DC, CC	Check compliance	During the entire operation
11.12	Damage to any artifacts/local old sites during construction will be prohibited and construction activities near these areas will be monitored by PPL executing dept.	PPL	Check compliance	Before and during the construction activity
11.13	The road will be re-aligned to maintain safe distance from the edge of any graveyard and shrine (if any).	PPL, CC	Check distance	Before and during construction
11.14	All community grievances will be addressed	PPL, DC, CC	Check compliance	During the entire operation
DC = Drilling Contractor; CC = Construction Contractor				

7 CONCLUSION

Initial Environmental Examination (IEE) was conducted on behalf of PPL for the proposed drilling activities of Kalat X-3 and X-4 Wells in Kalat Block 2866-2, Balochistan. The findings from the study performed have been categorically recorded and presented in the current report. To ensure compliance of both the study and formulation of the reporting, all relevant national and international legislations were followed and adhered to.

The IEE has identified and evaluated all the possible adverse impacts that may arise due to the construction of well site and well drilling activity. After identification and evaluation of the risks, mitigation measures have been proposed to eliminate or reduce the adverse impacts on the physical, biological and socioeconomic environment of the project area.

To ensure the complete implementation and monitoring of the proposed mitigation measures, Environmental Management Plan has been developed. The EMP also contains the monitoring plan, employee training plan and worker's health and safety plan.

Pakistan is facing an acute shortage of energy which is impeding the economic growth. To further worsen the problem a large portion of country's energy demands are met through expensive imports. Therefore, there is a dire need to explore and increase the production of crude oil and gas and thus reduce the import bills. The proposed project would help achieve this goal and also have a positive impact on socioeconomic conditions as it would provide more job opportunities to the local people and generate opportunities for more business.

The IEE concludes that the proposed activities will not lead to significant adverse environmental impacts and careful implementation of the EMP will ensure that potential impacts are managed and minimized and the project proponents meet all statutory requirements.

ANNEXURES

Annexure - I: Balochistan Environmental Protection Act 2012

BALOCHISTAN PROVINCIAL ASSEMBLY SECRETARIAT

BALOCHISTAN ENVIRONMENTAL PROTECTION BILL 2012 BILL NO. ___

OF 2012.

A

BILL

Balochistan Environmental Protection Bill 2012.

to provide for the protection, conservation, rehabilitation and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development

Preamble

Whereas, it is expedient to provide for the protection, conservation, rehabilitation and improvement of the environment, prevention and control of pollution, promotion of sustainable development, and for matters connected therewith and incidental thereto;

Short title, extent and commencement

1. It is enacted as follows:-

(1) *This Act, shall be called the Balochistan Environmental Protection Act, 2012.*

(2) *It extends to the whole Province of Balochistan except Tribal Areas.*

(3) It shall come into force at once.

Definitions

2. In this Act, unless there is anything repugnant in the subject or context,—

(a) adverse environmental effect" means impairment of, or damage to, the environment and includes—

(i) human health and property or biodiversity, coast, beaches and ecosystem;

(ii) pollution; and

(iii) any adverse environmental effect on Land, Air and Water;

(b) "Agricultural waste" means waste from farm and agricultural activities including poultry, cattle farming, animal husbandry residues from the use of fertilizers, pesticides and other farm . chemicals;

(c) "Air pollutant" means any substance that causes pollution of air and includes soot, smoke, dust particles, odour, light, electro-magnetic, radiation, heat, fumes, combustion exhaust, exhaust gases, noxious gases, hazardous substances and radioactive substances;

(d) *"Alien species" means a species that does not occur naturally in Balochistan.*

(e) *"Balochistan coastline or coastal zone" means the territorial jurisdiction of the coastline of the Province of Balochistan.*

(f) *"Best practicable environmental option" means the best method for preventing or minimizing adverse effects on the environment, having regard to, among other things:*

(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects;

(ii) the financial implications, and the effect on the environment, of that option when compared with other options; and

(iii) the current state of technical knowledge and the likelihood that the option can be successfully applied.

(g) "Biodiversity" or "biological diversity" means the variability among living organisms from all sources, including inter alia terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, including diversity within species, between species and of ecosystems;

(h) *"Clinical waste" means any waste produced by hospitals, clinics, nursing homes, doctor's offices, medical laboratories, medical research facilities and veterinarians which is infectious or potentially infectious.*

(i) "Council" means the Balochistan Environmental Protection Council established under section 3;

(j) "Discharge" includes spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping;

(k) "Ecosystem" means a dynamic complex of plant, animal and micro-organism communities and their non- living environment interacting as a functional unit;

(l) "Effluent" means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapor;

(m) "Electronic waste" means discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, Cathode ray tubes (CRT) and refrigerator, VCRs, stereos, copiers, and fax machines. It also includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal and electronic products nearing the end of their "useful life."

(n) "Emission standards" means the permissible standards established by the Provincial Agency for emission of air pollutants and noise and for discharge of effluent and waste;

(o) "Endemic and indigenous species" means a species which occurs naturally in the wild only in Balochistan, or a species which only breeds in the wild in Balochistan.

(p) "Environment" means—

(i) air, water and land;

(ii) all layers of the atmosphere;

(iii) all organic and inorganic matter and living organisms;

(iv) the ecosystem and ecological relationships;

(v) buildings, structures, roads, facilities and works;

(vi) all social and economic conditions affecting community life; and

(vii) the inter-relationships between any of the factors specified in sub-clauses (i) to (vi);

(q) "Environmental impact assessment" means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigation and

compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed;

(r) "Environmental Magistrate" means the Magistrate of the First Class appointed under Section 32 ;

(s) “Environmental Tribunal” means the Balochistan Environmental Protection Tribunal constituted under section 28;

(t) "Exclusive Economic Zone" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);

(u) "Factory" means any premises in which industrial activity is being undertaken;

(v) “Genetic Resource” means any material of plant, animal, microbial or other origin containing functional units of heredity of actual or potential value.

(w)“Government” means the Government of Balochistan.

(x) "Government Agency" includes—

(i) a department, attached department, bureau, section, commission, board, office or unit of the Provincial Government;

(ii) a developmental or a local authority, company or corporation established or controlled by the Provincial Government; and

(iii) the Balochistan Environmental Protection Agency. ; and

(iv) any other body defined and listed in the Rules of Business of the Provincial Government.

(y) "Handling", in relation to any substance, means the manufacture, processing, treatment, package, storage, transportation, collection, destruction, conversion, offering for sale, transfer or the like of such substance;

(z) "Hazardous substance" means—

(i) a substance or mixture of substances, other than a pesticide as defined in the Agricultural Pesticides Ordinance, 1971 (II of 1971), which, by reason of its chemical activity or toxic, explosive, flammable, corrosive, radioactive or other characteristics, causes, or is likely to cause, directly or in combination with other matters an adverse environmental effect; and

(ii) any substance which may be prescribed as a hazardous substance;

(aa) "Hazardous waste" means waste which is or which contains a hazardous substance or which may be prescribed as hazardous waste and includes hospital waste and nuclear waste;

(bb) "Historic waters" means such limits of the waters adjacent to the land territory of Pakistan as may be specified by notification under section 7 of the Territorial Waters and Maritime Zones Act, 1976 (LXXXII of 1976);

(cc) "Hospital waste" includes waste medical supplies and materials of all kinds, and waste blood, tissue, organs and other parts of the human and animal bodies, from hospitals, clinics and laboratories;

(dd) "Industrial activity" means any operation or process for manufacturing, making, formulating, synthesizing, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal, or for mining, for oil and gas exploration and development, or for pumping water or sewage, or for generating, transforming or transmitting power or for any other industrial or commercial purpose;

(ee) "Industrial waste" means waste resulting from an industrial activity;

(ff) "Initial Environmental Examination" means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an adverse environmental effect for requiring preparation of an environmental impact assessment;

(gg) “Integrated pollution control” means the holistic system aimed at pollution prevention and minimization at source, managing the impact of pollution and waste on the receiving environment and remediation of damaged and polluted environments.

(hh) “Living modified organism” means any living organism that possesses a novel combination of genetic material obtained through the use of modern technology.

(ii) "local authority" means regional or district set up of EPA or any Agency designated by the Provincial Government, by notification in the official Gazette, to be a local authority for the purposes of this Act;

(jj) "Local council" means a local council constituted or established under a law relating to local Government;

(kk) "Motor vehicle" means any mechanically propelled vehicle adapted for use upon land whether its power of propulsion is transmitted thereto from an external or internal source, and includes a chassis to which a body has not been attached, and a trailer, but does not include a vehicle running upon fixed rails;

(ll) "Municipal waste" includes sewage, refuse, garbage, waste from abattoirs, sludge and human excreta and the like;

(mm) "Environmental Quality Standards" means standards established by the Federal/Provincial Agencies under clause (e) of sub-section (1) of section 6 and approved by the Council under clause (c) of sub - section (1) of section 4;

(nn) "Noise" means the intensity, duration and character of sounds from all sources, and includes vibration;

(oo) "Nuclear waste" means waste from any nuclear reactor or nuclear plant or other nuclear energy system, whether or not such waste is radioactive;

(pp) "Person" means any natural person or legal entity and includes an individual, firm, association, partnership, society, group, company, corporation, co-operative society, Government Agency, non-governmental organization, community-based organization, village organization, local council or local authority and, in the case of a vessel, the master or other person having for the time being the charge or control of the vessel;

(qq) "Pollution" means the contamination of air, land or water by the discharge or emission of effluent or wastes or air pollutants or noise or other matter which either directly or indirectly or in combination with other discharges or

substances alters unfavorably the chemical, physical, biological, radiation, thermal or radiological or aesthetic properties of the air, land or water or which may, or is likely to make the air, land or water unclean, noxious or impure or injurious, disagreeable or detrimental to the health, safety, welfare or property of persons or harmful to biodiversity;

(rr) "Prescribed" means prescribed by rules made under this Act;

(ss) "Project" means any activity, plan, scheme, proposal or undertaking involving any change in the environment and includes—

(i) construction or use of buildings or other works;

(ii) construction or use of roads or other transport systems;

(iii) construction or operation of factories or other installations;

(iv) mineral prospecting, mining, quarrying, stone-crushing, drilling and the like;

(v) any change of land use or water use; and

(vi) alteration, expansion, repair, decommissioning or abandonment of existing buildings or other works, roads or other transport systems, factories or other installations;

(tt) "Protection of environment" means the qualitative and quantitative improvement of the different components of the environment and prevention of the deterioration of qualitative and quantitative standards;

(uu) "Proponent" means the person who proposes or intends to undertake a project;

(vv)"Provincial Agency" means the Balochistan Environmental Protection Agency established under section 5, or any Government Agency, local council or local authority exercising the powers and functions of the Provincial Agency;

(ww) "Rules &Regulations" means rules and regulation made under this Act;

(xx) "Sewage" means liquid or semi-solid wastes and sludge from sanitary conveniences, kitchens, laundries, washing and similar activities and from any sewerage system or sewage disposal works;

(yy) “Ship breaking” means breaking up of various types of ship for recycling.

(zz) "Standards" means qualitative and quantitative standards for discharge of effluent and wastes and for emission of air pollutants and noise either for general applicability or for a particular area, or from a particular production process, or for a particular product, and includes the Environmental Quality Standards, emission standards and other standards established under this Act and the rules and regulations;

(aaa) “Strategic Environmental Assessment” Strategic environmental assessment (SEA) is a system of incorporating environmental considerations into policies, plans, programmes and strategies. It is sometimes referred to as strategic environmental impact assessment.

(bbb) "Sustainable Development" means development that meets the needs of the present generation without compromising the ability of future generations to meet their needs;

(ccc) “Sustainable Management” means management of the use of natural resources to provide for the health, safety and social, cultural and economic well-being of people and communities taking into account the following:

(i) safeguarding the life-supporting capacity of natural resources and ecosystems;

(ii) ensuring the maintenance of the life-supporting capacity and quality of natural resources and ecosystems to meet the reasonably foreseeable

needs of future generations;

(iii) avoiding the creation of adverse effects and, where adverse effects cannot be avoided, mitigates and remedies adverse effects.

(ddd) "*Territorial waters" shall have the same meaning as in the Territorial Waters and Maritime Zones Act, l 976 (LXXXII of 1976);*

(eee) "Vessel" includes anything made for the conveyance by water of human beings or of goods; and

*(*fff*)* "Waste" means any substance or object which has been, is being or is intended to be, discarded or disposed of, and includes liquid waste, solid waste, waste gases, suspended waste, industrial waste, agricultural waste, nuclear waste, municipal waste, hospital waste, used polyethylene bags and residues from the incineration of all types of waste.

(ggg) "Water resource" includes surface water, an aquifer or ground water , a river or spring, a natural channel in which water flows regularly or intermittently, and a wetland, lake or dam into which, or from which, water flows.

Establishment of the Balochistan Environmental Protection Council.—

3. (1) The Provincial Government shall, by notification in the official Gazette, establish a Council to be known as the Balochistan Environmental Protection Council consisting of—

(a) Chief Minister or such other person as the Chief Minister may nominate in this behalf.	Chairperson
(b) Minister for Environment	Vice chairperson
(c) Chief Secretary Balochistan	Member
(d) Secretary Environment	Member/Secretary
(e) Secretary Finance	Member
(f) Secretary Industries	Member
(g) Secretary Agriculture	Member
(h) Secretary Forest	Member
(i) Secretary P&D	Member
(j) Secretary S&GAD	Member
(k) Director General EPA	Member

(l) Such other persons not exceeding six (6) as the Provincial Government may appoint, with the following representation:

One from the Balochistan Chamber of Commerce & Industries and one from the Balochistan Chamber of Agriculture, Two Environment experts/Scientist, One Educationist and One from Non Governmental Organization.

(2) The Members of the Council, other than ex-officio members, shall be appointed in accordance with the prescribed procedure and shall hold office for a term of two years.

(3) The Council may constitute committees of its members and entrust them with such functions as it may deem fit, and the recommendations of the

committees shall be submitted to the Council for approval. The council or any of such committee may seek assistance from any Government Department or expert in the relevant environmental field in performance of its functions.

Functions and powers of the Council.—

4. (1) The Council shall:-

(a) co-ordinate and supervise enforcement of the provisions of this Act; and

(b) approve comprehensive environmental policies and ensure their implementation within the framework of a National /Balochistan conservation strategy as may be approved by the Federal/Provincial Government from time to time;

(c) approve the Environmental Quality Standards;

(d) provide guidelines for the protection and conservation of species, habitats, and biodiversity in general, and for the conservation of renewable and non-renewable resources.

(e) co-ordinate integration of the principles and concerns of sustainable development into development plans and policies;

(f) The Council shall frame its own rules of procedure.

(g) The Council shall hold meetings, as and when necessary, but not less than two meetings, shall be held in a year.

(2) The Council may direct the Provincial Agency or any Government Agency to prepare, submit or implement projects for the protection, conservation, rehabilitation and improvement of the environment and the sustainable development of resources or to undertake research in any aspect of environment.

Establishment of the Balochistan Environmental Protection Agency.

5. (1) The Government of Balochistan shall by a notification in the official Gazette established Balochistan Environmental Protection Agency to exercise the powers and perform the functions assigned to it under this Act and the rules and regulations made there under.

(2) The Balochistan Environmental Protection Agency shall be headed by a Director-General who shall be appointed by the Government of Balochistan on such terms and conditions as it may determine.

(3) The Balochistan Environmental Protection Agency shall have such administrative, technical and legal staff, as the Government of Balochistan may specify, to be appointed in accordance with Balochistan Civil Servant Act 1974.

(4) The powers and functions of the Balochistan Environmental Protection Agency shall be exercised and performed by the Director-General.

(5) The Director-General may, by general or special order, delegate any of the powers and functions to staff appointed under sub-section (3).

(6) For assisting the Balochistan Environmental Protection Agency in the discharge of its functions the Government of Balochistan shall establish Advisory Committees for various sectors and appoint as members thereof representatives of the relevant sector, educational institutions and non- governmental organizations.

Functions of the Balochistan Environmental Protection Agency

6. (1) The Balochistan Environmental Protection Agency shall—

(a) administer and implement this Act and the rules and regulations made;

thereunder;

(b) prepare, in co-ordination with the relevant Government Agency and in consultation with the concerned sectors Advisory Committees, environmental policies for approval by the Council;

(c) take all necessary measures for the implementation of the national environmental policies approved by the Council;

(d) prepare and publish an Annual Environment Report on the state of the environment;

(e) establish standards for the quality of the ambient air, water and land, by notification in the official Gazette in consultation with the other relevant Government Departments/ Agencies.

(f) Revise the Environmental Quality Standards with approval of the Council:

Provided that

(i) before seeking approval of the Council, the Balochistan Environmental Protection Agency shall publish the proposed Environmental Quality Standards for public opinion in accordance with the prescribed procedure; and

(ii) different standards for discharge or emission from different sources and for different areas and conditions may be specified; where standards are less stringent than the Environmental Quality Standards prior approval of the Council shall be obtained;

(iii) certain areas, with the approval of the Council, may exclude from carrying out specific activities, projects from the application of such standards;

(g) co-ordinate environmental policies and programmes;

(h) establish systems and procedures for surveys, monitoring, measurement, examination, investigation, research, inspection and audit to prevent and control pollution, and to estimate the costs of cleaning up pollution and rehabilitating the environment in various sectors;

(i) take measures to promote research and the development of science and technology which may contribute to the protection of the environment, and sustainable development;

(j) certify one or more laboratories as approved laboratories for conducting tests and analysis and one or more research institutes as environmental research institutes for conducting research and investigation for the purposes of this Act.

(k) initiate legislation in various sectors of the environment;

(l) render advice and assistance in environmental matters including such information and data available with it as may be required for carrying out the purposes of this Act:

Provided that the disclosure of such information shall be subject to the restrictions contained in the proviso to sub-section (3) of section 15;

(m) assist the local councils, local authorities, Government Agencies and other persons to implement schemes for the proper disposal of wastes so as to ensure compliance with the standards established by it;

(n) provide information and guidance to the public on environmental matters;

(o) recommend environmental courses, topics, literature and books for incorporation in the curricula and syllabi of educational institutions;

(p) promote public education and awareness of environmental issues through mass media and other means including seminars and workshops;

(q) specify safeguards for the prevention of accidents and disasters which may cause pollution, collaborate with the concerned person in the preparation of contingency plans for control of such accidents and disasters, and co-ordinate implementation of such plans;

(r) encourage the formation and working of non-governmental organizations, community organizations and village organizations to prevent and control pollution and promote sustainable development;

(s) perform any function which the Council may assign to it.

(2) The Balochistan Environmental Protection Agency may—

(a) undertake inquiries or investigation into environmental issues, either of its own accord or upon complaint from any person or organization;

(b) request any person to furnish any information or data relevant to its functions;

(c) initiate with the approval of the ***Provincial/Federal Government,*** requests for foreign assistance in support of the purposes of this Act and enter into arrangements with foreign agencies or organizations for the exchange of material or information and participate in international seminars or meetings;

(d) recommend to the Government of Balochistan the adoption of financial and fiscal programmes, schemes or measures for achieving environmental objectives and goals and the purposes of this Act, including—

(i) incentives, prizes awards, subsidies, tax exemptions, rebates and depreciation allowances; and

(ii) taxes, duties and other levies;

(e) establish and maintain laboratories to help in the performance of its functions under this Act and to conduct research in various aspects of the environment and provide or arrange necessary assistance for establishment of similar laboratories in the private sector;

(f) provide or arrange, in accordance with such procedure as may be prescribed, financial assistance for projects designed to facilitate the discharge of its functions.

Powers of the Balochistan Environmental Protection Agency

7. Subject to the provisions of this Act*, the Balochistan Environmental Protection Agency may*

(a) lease, purchase, acquire property both moveable and immovable;

(b) fix and realize fees, rates and charges for rendering any service or providing any facility, information or data under this Act or the rules and regulations;

(c) enter into contracts, execute instruments subject to approval of the Provincial Government, necessary for proper management and conduct of its business made thereunder;

(d) subject to approval of the Provincial Government appoint in accordance with prescribed procedures such experts and consultants as it considers necessary for the efficient performance of its functions on appropriate terms and conditions;

(e) summon and enforce the attendance of any person and require him to supply any information or document needed for the conduct of any enquiry or investigation into any environmental issue;

(f) The Director General Balochistan EPA or any other Regional officer specifically authorized in this behalf by the Director General shall have the power to impose fine/administrative penalty up to rupees one hundred thousand from case to case basis.

(i) the fine/administrative penalty shall be recovered as per land revenue act.

(ii) the fine/administrative penalty initially or for an interim period shall be placed with the Balochistan EPA till the decision of the Environmental Tribunal or Magistrate; and

(iii) the fine/administrative penalty after the final decision shall be deposited in the public exchequer.

(g) enter and inspect and under the authority of a search warrant issued by the Environmental Court or Environmental Magistrate, search at any reasonable time, any land, building, premises, vehicle or vessel or other place where or in which. there are reasonable grounds to believe that an offence under this Act has been, or is being, committed;

(i) Subject to the provisions of this Act, any person generally or specifically authorized in this behalf by the Director General shall be entitled to enter, at all reasonable times, with such assistance as he considers necessary, any building or place for the following purposes, namely:-

a) to perform duties conferred on him under this Act or rules;

b) to inspect any activity in such building or place in accordance with this Act, the rules or any notice, order or direction issued thereunder;

c) to examine or test any equipment, industrial plant, record, register or any other important matter relating thereto;

d) to conduct a search of any building or place which the said person has reason to believe to have been the place of occurrence of any offence in contravention of any notice, order or direction issued under this Act or the

rules;

e) to seize/close any equipment, industrial plant, record, register, document or other matter which may serve as evidence of the commission of any offence punishable under this Act or the rules.

(ii) The provisions of the Code of Criminal Procedure shall be applicable in respect of any search or seizure under this Act.

(a) take samples of any materials, products, articles or substances or of the effluent, wastes or air pollutants being discharged or emitted or of air, water or land in the vicinity of the discharge or emission;

(b) arrange for test and analysis of the samples at a certified laboratory;

(i) Every person authorized in this behalf by the Director General may, in such manner as may be prescribed by rules, collect from any factory, premises or place samples of air, water, soil or of any other substance for the purpose of analysis.

(ii) The results of the analysis of samples collected under clause (i) shall not be admissible in evidence in any legal proceeding unless the provisions of the clauses (iii) and (iv) have been complied with.

(iii) Subject to the provisions of sub-section (4), the officer collecting a sample under clause (i) shall-

(a) serve notice on the owner or proponent or agent of the said place, in such manner as may be prescribed by rules, of his intention to collect such sample;

(b) collect the sample in the presence of the said occupier or agent;

(c) put the sample into a container and affix on it a seal bearing the signatures of himself and of the occupier or agent;

(d) prepare a report of the sample collected and sign it himself and take the signature of the occupier or agent;

(e) send without any delay, the said container to the laboratory specified by the Director General EPA.

(iv) Where a sample is collected under clause (i) and a notice is served by the collecting officer under sub clause a) of clause (iii), the collecting officer shall, if the occupier or agent willfully absents himself at the time of the collection of the sample or, though being present, refuses to sign the sample or report, in the presence of two witnesses, give his signature and attest and seal it and shall send it without any delay to the laboratory specified by the Director General, mentioning that the occupier or agent had not been present or, as the case may be, refused to give his signature.

(i) confiscate any article used in the commission of the offence where the offender is not known or cannot be found within a reasonable time:

Provided that the power under clauses (f), (h), (I) and (j) shall be exercised in accordance with the provisions of the Code of Criminal Procedure, 1898 (Act V of 1898). or the rules made under this Act and under the direction of the Environmental

Tribunal or Environmental Magistrate; and

(j) establish an Environmental Co-ordination Committee comprising the Director-General as its chairman and the heads of relevant Government Agencies and such other persons as the Government of Balochistan may appoint as its members to exercise such powers and perform such functions as may be delegated or assigned to it by the Government of Balochistan for carrying out the purposes of this Act and for ensuring inter departmental co-ordination in environmental policies.

Establishment, powers and functions of the Regional or District Environmental Protection Agencies.—

8. (1) Government of Balochistan shall, by notification in the official Gazette, establish the Regional or District Environmental Protection Agency, to exercise such powers and perform such functions as may be delegated to it by the Government of Balochistan under sub-section (2) of section 34.

(2) The Regional or District Environmental Protection Agency shall be headed by an officer at least of the rank of regional Director or Deputy Director who shall be appointed by the Provincial Government on such terms and conditions as prescribed in the Balochistan Civil Servant Act 1974.

(3) The Regional or District Environmental Protection Agency shall have such administrative, technical and legal staff as the Government of Balochistan may specify, to be appointed in accordance with the Balochistan Civil Servants Appointment, Promotion and Transfers Rules 2009 such procedure as may be prescribed.

(4) The powers and functions of the Regional or District Environmental Protection Agency shall be exercised and performed by an Officer of the rank of regional Director or Deputy Director appointed as head.

(5) The Director General may, by general or special order, delegate any of the powers and functions to staff appointed under sub-section (3).

Establishment of the Balochistan Sustainable Development Funds.—

9. (1) There shall be established in the Province a Balochistan Sustainable Development Fund.

(2) The Balochistan Sustainable Development Fund shall be derived from the following sources, namely:—

(a) grants made or loans advanced by the Federal Government or the Provincial Government;

(b) aid and assistance, grants, advances, donations and other non-obligatory funds received from foreign governments, national or international agencies, and non-governmental organizations; and

(c) contributions from private organizations and other persons.

(3) The Balochistan Sustainable Development Fund shall be utilized in accordance with such procedure as may be prescribed for—

(a) providing financial assistance to the projects in the public/private sector designed for the protection, conservation, rehabilitation and improvement of the environment, the prevention and control of pollution, the sustainable development of resources and for research in any aspect of environment; and

(b) any other purpose which in the opinion of the Board shall help to achieve environmental objectives and the purposes of this Act.

Management of the Balochistan Sustainable Development Fund.—

10. (1) The Balochistan Sustainable Development Fund shall be managed by a Board known as the Sustainable Development Fund Board consisting of:-

(i) Secretary Environment Department Chairperson

(ii) Secretary Industries Department Member

(iii) Secretary Social welfare Department Member

(iv) Secretary Finance Department Member

(v) Secretary Forest Department Member

(vi) Secretary Agriculture Department Member

(vii) such non-official persons not exceeding six (6) as the Members Government of Balochistan may appoint including two (2)representatives of the Balochistan Chamber of Commerce and Industry, two (2) representatives of the Balochistan Chamber of Agriculture and two (2) representative of leading non-governmental organizations/donors.

(viii) Director General, Balochistan Environmental Protection Agency Member/Secretary

(2) the Board shall have the power to—

(a) sanction financial assistance for eligible projects; as specified in section 9(3) of this Act

(b) invest moneys held in the Balochistan Sustainable Development Fund in such profit - bearing Government bonds, savings schemes and securities as it may deem suitable; and

(3) The Board shall constitute committees of its members to undertake regular monitoring of projects financed from the Balochistan Sustainable Development Fund and to submit progress reports to the Board which shall publish an Annual Report incorporating its annual audited accounts and performance evaluation based on the progress reports.

(4) Audit of the fund shall be conducted on annual basis.

Inter-Provincial Environmental issues:-

11. (1) The project falling within the geographical jurisdiction of two or more Provinces, the IEE or EIA may be submitted by the proponent to each Provincial Environmental Agencies for review and approval.
(2) In case of any dispute or concerns the matter shall be settled through mutual consultation of the Provinces to avoid any inconveniences or future litigation.
(3) The concerned Provinces may constitute a joint technical or review committee including a representative of the concerned Federal Ministry dealing with Environment and coordination.

Multilateral Environmental Agreements:-

12. (1) The obligation of the International Conventions, Treaties and Protocols shall be observed as before devolution of the subject of Environment to the Province on Environment or climate change. In case of any international/ bilateral cooperation, the matter shall be proceeded with consultation with the concerned Federal Ministries.

(2) The Government of Balochistan/ Environmental Protection Agency shall extend support to those obligation of the International Conventions, Treaties and Protocols where adequate assistance provided by the Federal Government.

Strategic Environment Assessment (SEA):-

13. (1) This section regulates the conditions, methods and procedure according to which the assessment of impact of certain plans and programmes on the environment (hereinafter referred to as: strategic assessment) shall be carried out in order to provide for the environmental protection and improvement of sustainable development through integration of basic principles of environmental protection into the procedure of preparation and adoption of plans and programmes.

(2) The Government at all levels of administration and in every sector shall incorporate environmental considerations into policies, plans, programmes and strategies.

Prohibition of certain discharges or emissions and potential harmful items or materials .—

14. (1) Subject to the provisions of this Act and the rules and regulations no person shall discharge or emit or allow the discharge or emission of any effluent or waste or air pollutant or noise in an amount, concentration or level or is likely to cause, a significant adverse effect on the environment or human health which is in excess of the Environmental Quality Standards or, where applicable, the standards established under sub -clause (ii) of clause (f) of section 6.

(2) The Government of Balochistan shall not allow any imported or locally made commodities or items or materials or equipment or instruments or automobile or pesticides etc, into its provincial jurisdiction which may have any potential of causing Environmental problems.

(3) No person or company related to public and private sector shall introduce any of the imported or locally made items or materials or equipment or instruments or automobile or pesticides etc as per subsection (2) for any purpose unless it has filed an application to the Balochistan Environmental Protection Agency, as the case may be, and has obtained approval from the Government Agency in respect thereof.

(4) The Government of Balochistan may levy a pollution charge on any person who contravenes or fails to comply with the provisions of sub-section (1), to be calculated at such rate, and collected in accordance with such procedure as may be prescribed.

(5) Any person who pays the pollution charge levied under sub-section (2) shall not be charged with an offence with respect to that contravention or failure.

(6) The approved license in terms of section 15 of this Act does not affect the applicant's duty to obtain any other authorization required in order to undertake the activity or implement the project concerned, whether in terms of this Act or any other legislation

(7) A person /firm causing discharge of pollutants shall take all reasonable measures to ensure that the best practicable environmental option is adopted in relation to the discharge of emission and conservation of the environment.

Initial Environmental Examination and Environmental Impact Assessment.—

15. (1) No proponent of a project of public and private sector shall commence construction or operation unless he has filed an Initial Environmental Examination with the Government Agency designated by Balochistan Environmental Protection Agency, as the case may be, or, where the project is likely to cause an adverse environmental effects an environmental impact assessment, and has obtained from the Government Agency approval in respect thereof.

(2) The Government Agency shall subject to standards fixed by the Balochistan

Environmental Protection Agency—

(a) review the initial environmental examination and accord its approval, or require submission of an environmental impact assessment by the proponent; or

(b) review the environmental impact assessment and accord its approval subje to such conditions as it may deem fit to impose, require that the environmental impact assessment be re-submitted after such modifications as may be stipulated c reject the project as being contrary to environmental objectives.

(3) Every review of an environmental impact assessment shall be carried out with public participation and no information will be disclosed during the course of such public participation which relates to—

(i) trade, manufacturing or business activities, processes or techniques of a proprietary nature, or financial, commercial, scientific or technical matters which the proponent has requested should remain confidential, unless for reasons to be recorded in writing, the Director General of the Balochistan Environmental Protection Agency is of the opinion that the request for confidentiality is not well- founded or the public interest in the disclosure outweighs the possible prejudice to the competitive position of the project or its proponent; or

(ii) international relations, national security or maintenance of law and order, except with the consent of the Government of Balochistan; or

(iii) matters covered by legal professional privilege.

(4) The Government Agency shall communicate its approval or otherwise within a period of four months from the date the initial environmental examination or environmental impact assessment is filed complete in all respects in accordance with the prescribed procedure, failing which the initial environmental examination or, as the case may be, the environmental impact assessment shall be deemed to have been approved, to the extent to which it does not contravene the provisions of this Act and the rules and regulations.

(5) Subject to sub-section (4) the appropriate Government may in a particular case extend the aforementioned period of four months if the nature of the project so warrants.

(6) The provisions of sub-sections (1), (2), (3), (4) and (5) shall apply to such categories of projects and in such manner as may be prescribed.

(7) The Government Agency shall maintain separate registers for initial environmental examination and environmental impact assessment projects, which shall contain brief particulars of each project and a summary of decisions taken thereon, and which shall be open to inspection by the public at all reasonable hours and the disclosure of information in such registers shall be subject to the restrictions specified in sub-section (3).

(8) No concession areas for any developmental activities shall be awarded to any International/National groups or firms without consultation and concurrence of the Government of Balochistan/Environmental Protection Agency.

(9) The prospect licenses for mining, quarrying, crushing etc. shall only be awarded/ granted in compliance with the sub section (1), (2), (3), (4) and (5) .

(10) The cellular companies shall obtain environmental approval from the Balochistan EPA before installing Base Transceivers Station (BTS).

(11) BTS Stations should be required to undergo routine evaluation for Compliance. Whenever an application is submitted to the Balochistan EPA for construction or modification of a transmitting facility. EPA shall have the authority to take action if a cellular base station antenna does not comply with the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines and recommendations of the report titled `Environmental and Health Related Effects of the Cellular Base Station Antennas' carried out by IT and Telecom Division, Ministry of Information Technology.

(12) No person or company related to public and private sector shall commence construction or operation unless the concerned building authority accord approval under the provisions of the in vogue Building Code.

(13) after fulfilling the sub section (12) an action plan shall be submitted to the concerned municipal/town/union council to carry out the activities for a specific time period as to provide the general public or road users an alternative corridor.

(14) the waste generated during the construction or maintenance or repair of any building shall be appropriately disposed of or transported or collected to a designated place allocated for the purpose like any land fill site to avoid public nuisance.

(15) the construction or repair activities especially in the main city area shall be carried out in a manner to minimize the road congestion or blockage.

(16) the proponent of the project shall remit fifty thousand rupees as review fee of an Initial Environmental Examination (IEE) and one hundred thousand as review fee for Environmental Impact Assessment (EIA).

(17) the person or company in public or private sector intend to commence any scheme or project do not falling under schedule I and II of this Act shall remit twenty five thousand rupees as an Environmental approval fee to the Balochistan Environmental Protection Agency.

Prohibition of import of hazardous waste.—

16. No person shall import hazardous waste into Balochistan and its jurisdiction limits.

Handling of hazardous substances and License:-

17. (1) Subject to the provisions of this Act, no person shall generate, collect, consign, transport, treat, dispose of, store, handle or import any hazardous substance except—

(a) under a license issued by the Government of Balochistan and in such manner as may be prescribed; or

(b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party.

(2) Every owner or proponent of any land or premises on which hazardous waste is kept, treated or disposed of shall make a written application to the Balochistan Environmental Protection Agency for a hazardous waste management license, which shall at least include details of:

a) the chemical composition, nature and volume of the waste which is being, or will be, produced;

b) the industrial process, trade or activity giving rise to the waste;

c) the way in which the applicant proposes to keep, treat or dispose of the hazardous waste, including storage and handling procedures;

d) the precautions which will be taken to avoid any adverse effects on the environment being caused by the hazardous waste.

(3). the Balochistan Environmental Protection Agency shall evaluate each application for a license under this Article in the following manner:

a) grant a hazardous waste management license, with or without conditions, if satisfied that the proposed method of keeping, treating and disposing of the hazardous waste will not cause any adverse effects; or

b) refuse to grant a license giving reasons for the refusal in writing to the applicant.

(4). the Balochistan Environmental Protection Agency would take a decision in regard to subsection 2 within thirty (30) days of the date of lodging of the application for a license.

(5) The license shall be granted for a reasonable period not exceeding five years. On expiry of the license for renewal same procedure shall be followed.

Electronic Wastes:-

18. (1) Every producer, distributer, collection centre, refurbisher, dismantler or recyclers shall store the electronic waste for a period not exceeding six months and shall maintain a record of collection, sale, transfer, storage and segregation of wastes and make these records available for inspection:

Provided that the Balochistan Environmental Protection Agency may extend the said period in following cases, namely:

(a) Dismantlers and Recyclers up to six months of their annual storage capacity of the owner; or

(b) Collection centers who do not have access to any registered dismantling or recycling facility; or

(c). the waste which needs to be specifically stored for development of a process for its recycling, reuse.

(2) Every producer, distributer, collection centre, refurbisher, dismantler or recyclers shall make arrangements for the environmentally sound management and disposal of electronic waste.

(3) the 'environmentally sound management of electronic waste' as "taking all steps required to ensure that electronic waste are managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such wastes."

(4) the provisions of this section shall apply to every producer, consumer and bulk consumer involved in manufacture, sale, purchase and processing of electronic equipment or components.

(5) information dissemination on electronic waste and the environmentally sound management of electronic waste is also mandated from producers.

(6) to regulate the provisions of this section all the relevant international conventions, protocols and treaties collectively called as multilateral environmental agreements (MEAs) shall be applicable where Pakistan is signatory or ratified the MEAs.

(7) any person or company or unit who contravenes or fails to comply with the provisions of the above subsections shall be imposed penalty under section 25 of this act.

General Prohibition in relation to Solid and Hospital Waste management and Waste Management License:-

19. (1) No person may collect, transport, sort, recover, store, dispose of or otherwise manage waste in a manner that results in a significant adverse effect.

(2) Every person who imports, produces, collects, recovers, transports, keeps, treats or disposes of waste shall take all reasonable measures to prevent a significant adverse effect on the environment from occurring.

(3) The owner or proponent of every premises upon which solid and hazardous hospital waste is produced shall ensure that all hazardous waste whether solid or hospital waste is separated from other waste, and is stored in separate containers pending disposal, in accordance with the requirements of the Balochistan Environmental Protection Agency as set out in regulations, published guidelines or license conditions.

(4) A person shall not dispose of solid and hazardous hospital waste in such a manner that it becomes litter or is likely to become litter.

(5) Unless in possession of a valid waste management license issued by the Balochistan Environmental Protection Agency, no person may construct, own or operate a landfill site, incinerator or other facility at which waste is permanently disposed of or is stored indefinitely.

(6). The Balochistan Environmental Protection Agency shall evaluate each application for a license and shall do the following:

a) grant a license if the Balochistan Environmental Protection Agency is satisfied that the applicant has sufficient expertise to undertake the activity in question in accordance with the law and in a manner that will not have significant adverse effects; or

b) refuse to grant a license giving reasons for the refusal in writing to the applicant.

(7). The Balochistan Environmental Protection Agency shall reach a decision in regard to subsection 2 within thirty (30) days of the date of lodging of the application for a license with the Balochistan Environmental Protection Agency.

(8). If there are reasonable grounds to grant license, and those grounds are communicated to the license holder in writing, the Balochistan Environmental Protection Agency may amend, revoke or impose new conditions in an existing waste management license.

(9). The license granted under subsection (6) shall be subject to review if condition of license granted are not fulfilled.

Management of Water Resources:-

20. (1) All persons, for the purpose of protection, conservation, development, use, control and management of water resources, would take into account the following measures:

a) protecting aquatic and associated ecosystems and their biological diversity;

b) reducing and preventing pollution and degradation of water resources.

(2) When preparing water resource management plans, Departments and other relevant institutions shall at least take the following into account:

a) provisions for integrated watershed management;

b) regulation of sustainable abstraction of groundwater;

c) regulation of the use of ground or surface water for agricultural, industrial, mining, and urban purposes;

d) measures to protect human health and ecosystems;

e) measures to protect wetlands and their associated ecosystems;

f) any other provision necessary for the sustainable use and management of water resources.

(3) An owner of land or a person who uses the land on which any activity or process is performed or undertaken which causes or is likely to cause significant pollution of a water resource must take measures to prevent any such pollution.

Regulation of motor vehicles.

21. (1) Subject to the provisions of this Act, and the rules and regulations, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the Environmental Quality Standards, or where applicable the standards established under clause (e) of section 6 (1).

(2) For ensuring compliance with the standards mentioned in sub-section (1), the Balochistan Environmental Protection Agency may direct that any motor vehicle or class of vehicles shall install such pollution control devices or other equipment or use such fuels or undergo such maintenance or testing as may be prescribed.

(3) Where a direction has been issued by the Government Agency under subsection (2) in respect of any motor vehicles or class of motor vehicles, no person shall operate any such vehicle till such direction has been complied with.

(4) To regulate the provision of this Act a green squad comprising of representative of Traffic Police, Motor Vehicle Examiner, Excise & Taxation and EPA Balochistan shall be in place to monitor and inspect the automobiles running on the road as per the Environment Quality Standard.

(5) The inspection or monitoring shall be carried out at least once in a month wherein a mechanism be chalked out for issuance of warning tickets (red: Highly polluted, Blue: less polluted) on a prominent on the vehicle, as the case may be for specific period of time not exceeding 30 days to maintain the vehicle in order .

(6) Whoever contravenes or fails to comply with the provision of subsection (5) such vehicle should be made off road or punishable with fine at least twenty thousand rupees which may be extended to one hundred thousand rupees. In the case of continuing contravention or failure the vehicle shall be impounded.

Alien Species and Living Modified Organisms:-

22. (1) The import into Balochistan of alien species and of living modified organisms is prohibited without a permit issued by the relevant authority under any law enforce in Balochistan. The Balochistan Environmental Protection Agency in consultation with the Departments of Agriculture, Livestock and Animal Husbandry and Food shall monitor the matter.

(2) No permit for the introduction of an alien species or of a living modified organism shall be issued unless the environmental impact indicates that there is a reasonable certainty that no harm to indigenous natural resources or human health will result from the proposed introduction.

(3) Subsection 1 and 2 of this Section shall apply equally to introductions of alien species and living modified organisms into the Province of Balochistan and to introductions from one ecosystem to another within the province.

(4) The introduction of alien species and living modified organisms into protected areas shall not be allowed.

Coastal Zone:-

23. (1) Subject to the provisions of this Act the activities or concentration or level of discharges of the following units established on onshore and offshore shall be monitored strictly to prevent the pollution and environmental degradation caused by the following multi-magnitude and multidisciplinary units.

a) Ports and shipping
b) Fisheries
c) Ship dismantling
d) Shipping Traffic (Oil Tankers & Vessels) & dredging.
e) Oil and gas mineral exploration.
f) Coastal power plants and Energy sector.
g) Oil refineries and Industries

(2) The ship breaking at Gaddani or anywhere else in the coastal belt/zone of this province shall be subject to fulfilling all the relevant obligations under the Basel Convention “on the Control of Trans-boundary Movements of Hazardous Waste and their Disposal”, Rotterdam Convention “on the prior Informed Consent(PIC) Procedure for certain Hazardous Chemicals and Pesticides in International Trade” and other relevant Treaties/Protocols and provisions of this Act.

(3) During the process of ship breaking/dismantling the waste, hazardous waste or sludge or Polychlorinated biphenyls or asbestos etc, shall be disposed of in a manner to ensure Protection of Terrestrial and Marine environment.

(4) The activities of ship breaking/dismantling activities on shore or offshore within territorial limit of Balochistan shall be monitored at least biannually to ensure environmental protection and prevent degradation and pollution.

(5) The disposal of untreated sewage and domestic wastes and untreated disposal of industrial effluents into the sea is an offence any person or company or unit who contravenes or fails to comply with the provisions of this Act shall face to penalty under section 25.

Environmental protection order.

24. (1) Where the Balochistan Environmental Protection Agency is satisfied that the discharge or emission of any effluent, waste, air pollutant or noise, or the disposal of waste, or the handling of hazardous substances, or any other act or omission is likely to occur, or is occurring, or has occurred, in violation of the provisions of this Act, rules or regulations or of the conditions of a license, and is likely to cause, or is causing or has caused an adverse environmental effect, the Balochistan Environmental Protection Agency may, after giving the person responsible for such discharge, emission, disposal, handling, act or omission an opportunity of being heard, by order direct such person to take such measures that the Balochistan Environmental Protection Agency may consider necessary within such period as may be specified in the order.

(2) In particular and without prejudice to the generality of the foregoing power, such measures may include—

(a) immediate stoppage, preventing, lessening or controlling the discharge, emission, disposal, handling, act or omission, or to minimize or remedy the adverse environmental effect;

(b) installation, replacement or alteration of any equipment or thing to eliminate, control or abate on a permanent or temporary basis, such discharge, emission, disposal, handling, act or omission;

(c) action to remove or otherwise dispose of the effluent, waste, air pollutant, noise, or hazardous substances; and

(d) action to restore the environment to the condition existing prior to such discharge, disposal, handling, act or omission, or as close to such condition as may be reasonable in the circumstances, to the satisfaction of the Balochistan Environmental Protection Agency.

(3) Where the person, to whom directions under sub-section (1) are given, does not comply therewith, the Balochistan Environmental Protection Agency may, in addition to the proceedings initiated against him under this Act, the rules and regulations, itself take or cause to be taken such measures specified in the order as it may deem necessary and may recover the reasonable costs of taking such measures from such person as arrears of land revenue.

Penalties

25. (1) Whoever contravenes or fails to comply with the provisions of sections 14, 15, 16, 18 or section 24 or any order issued there-under shall be punishable with fine which may extend to one million rupees, and in the case of a continuing contravention or failure, with an additional fine which may extend to one hundred thousand rupees for every day during which such contravention or failure continues:

Provided that if contravention of the provisions of section 14 also constitutes contravention of the provisions of section 21, such contravention shall be punishable under sub-section (2) only.

(2) Whoever contravenes or fails to comply with the provisions of section 17, 19, 21, 22 or 23 or any rule or regulation or conditions of any license, any order or direction, issued by the Council or the Balochistan Environmental Protection Agency, shall be punishable with fine which may extend to one hundred thousand rupees, and in case of continuing contravention or failure

with an additional fine which extend to one thousand rupees for every day during which such contravention continues.

(3) Where an accused has been convicted of an offence under sub-sections (1) and (2), the Environmental Court and Environmental Magistrate, as the case may be, shall, in passing sentence, take into account the extent and duration of the contravention or failure constituting the offence and the attendant circumstances.

(4) Where an accused has been convicted of an offence under sub-section (1) and the Environmental Court is satisfied that as a result of the commission of the offence monetary benefits have accrued to the offender, the Environmental Court may order the offender to pay, in addition to the fines under sub-section (1), further additional fine commensurate with the amount of the monetary benefits.

(5) Where a person convicted under sub-sections (1) or sub-section (2) had been previously convicted for any contravention under this Act, the Environmental Court or, as the case may be, Environmental Magistrate may, in addition to the punishment awarded thereunder—

(a) endorse a copy of the order of conviction to the concerned trade or industrial association, if any, or the concerned Provincial Chamber of Commerce and Industry or the Federation of Pakistan Chambers of Commerce and Industry;

(b) sentence him to imprisonment for a term which may extend to two years;

(c) order the closure of the factory;

(d) order confiscation of the factory, machinery, and equipment, vehicle, material or substance, record or document or other object used or involved in contravention of the provisions of the Act:

Provided that for a period of three years from the date of commencement of this Act the sentence of imprisonment shall be passed only in respect of persons who have been previously convicted for more than once for any contravention of sections 14, 16, 17, 18,19 or 24 involving hazardous waste;

(e) order such person to restore the environment at his own cost, to the conditions existing prior to such contravention or as close to such conditions as may be reasonable in the circumstances to the satisfaction of the Balochistan Environmental Protection Agency; and

(f) order that such sum be paid to any person as compensation for any loss, bodily injury, damage to his health or property suffered by such contravention.

(6) The Director-General of the Balochistan Environmental Protection Agency or an officer generally or specially authorized by him in this behalf may, on the application of the accused compound an offence under this Act with the permission of the Environmental Tribunals or Environmental Magistrate in accordance with such procedure as may be prescribed.

(7) Where the Director-General of the Balochistan Environmental Protection Agency is of the opinion that a person has contravened any provision of Act he may, subject to the rules, by notice in writing to that person require him to pay to the Balochistan Environmental Protection Agency an

administrative penalty in the amount set out in the notice for each day the contravention continues; and a person who pays an administrative penalty for a contravention shall not be charged under this Act with an offence in respect of such contravention.

(8) The provisions of sub-sections (6) and (7) shall not apply to a person who has been previously convicted of offence or who has compounded an offence under this Act who has paid an administrative penalty for a contravention of any provision of this Act.

Offences by bodies corporate

26. Where any contravention of this Act has been committed by a body corporate, and it is proved that such offence has been committed with the consent or connivance of, or is attributed to any negligence on the part of, any director, partner, manager, secretary or other Officer of the body corporate, such director, partner, manager, secretary or other officer of the body corporate, shall be deemed guilty of such contravention along with the body corporate and shall be punished accordingly:

Provided that in the case of a company as defined under the Companies Ordinance, 1984 (XLVII of 1984), only the Chief Executive as defined in the said Ordinance shall be liable under this section.

Explanation.— For the purposes of this section, "body corporate" includes a firm, association of persons and a society registered under the Societies Registration Act, 1860 (XXI of 1860), or under the Co-operative Societies Act, 1925 (VII of 1925).

Offences by Government Agencies, local authorities or local councils.

27. Where any contravention of this Act has been committed by any Government Agency, local authority or local council, and it is proved that such contravention has been committed with the consent or connivance of, or is attributable to any negligence on the part of, the Head or any other officer of the Government Agency, local authority or local council, such Head or other officer shall also be deemed guilty of such contravention along with the Government Agency, local authority or local council and shall be liable to be proceeded against and punished accordingly.

Balochistan Environmental Tribunals.—

28. (1) The Government of Balochistan may, by notification in the official gazette establish Balochistan Environmental Protection Tribunals which shall exercise jurisdiction under this Act.

(2) The Balochistan Environmental Protection Tribunal shall consist of a Chairperson who is, or has been, or is qualified for appointment as, a judge of the High Court to be appointed after consultation with the Chief Justice of the High Court and two members to be appointed by the Government of Balochistan which at least one shall be a technical member with suitable professional qualifications and experience; in the environmental field as may be prescribed. For every sitting of the Balochistan Environmental Protection Tribunal the presence of the Chairperson and not less than one Member shall be necessary.

(3) A decision of Balochistan Environmental Protection Tribunal shall be expressed in terms of the opinion of the majority or if the case has been decided by the Chairperson and only one of the members and a there is a difference of opinion between them, the ;decision of the Balochistan Environmental Protection Tribunal shall be expressed in terms of the opinion of the Chairperson.

(4) Balochistan Environmental Protection Tribunal shall not, merely by reason of a change in its composition, or the absence of any member from any sitting, be bound to recall and rehear any witness who has given evidence, and

may act on the evidence already ;recorded by, or produced, before it.

(5) Balochistan Environmental Protection Tribunal may hold its sittings at such places within its territorial jurisdiction as the Chairperson may decide.

(6) No act or proceeding of Balochistan Environmental Protection Tribunal shall be invalid by reason only of the existence of a vacancy in, or defect in the constitution, of, the Balochistan Environmental Protection Tribunal.

(7) The terms and conditions of service of the Chairperson and members of the Balochistan Environmental Protection Tribunal shall be such as may be prescribed.

Jurisdiction and powers of Balochistan Environmental Tribunals.

29. (1) Balochistan Environmental Protection Tribunal shall exercise such powers and perform such functions as are, or may be, conferred upon or assigned to it by or under this Act or the rules and regulations made there under.

(2) All contravention punishable under sub-section (1) of section 25 shall exclusively be triable by Balochistan Environmental Protection Tribunal.

(3) Balochistan Environmental Protection Tribunal shall not take cognizance of any offence triable under sub-section (2) except on a complaint in writing by- -

(a) the Government Agency or local council; and

(b) any aggrieved person, who has given notice of not less than thirty days to the Provincial Agency concerned, of the alleged contravention and of his intention to make a complaint to the Environment Tribunal.

(4) In exercise of its criminal jurisdiction, the Balochistan Environmental Protection Tribunal shall have the same powers as are vested in Court of Session under the Code of Criminal Procedure, 1898 (Act V of 1898).

(5) In exercise of the appellate jurisdiction under section 22 the Balochistan Environmental Protection Tribunal shall have the same powers and shall follow the same procedure as an appellate court in the Code of Civil Procedure, 1908 (Act V of 1908).

(6) In all matters with respect to which no procedure has been provided for in this Act, the Balochistan Environmental Protection Tribunal shall follow the procedure laid down in the Code of Civil Procedure, 1908 (Act V of 1908).

(7) Balochistan Environmental Protection Tribunal may, on application filed by any officer duly authorized in this behalf by the Director-General of the Balochistan Environmental Protection Agency, issue bail able warrant for the arrest of any person against whom reasonable suspicion exist, of his having been involved in contravention punishable under sub-section (1) of Section 25:

Provided that such warrant shall be applied for, issued, and executed in accordance with the provisions of the Code of Criminal Procedure, 1898 (Act V of 1898):

Provided further that if the person arrested executes a bond with sufficient sureties in accordance with the endorsement on the warrant he

shall be released from custody, failing which he shall be taken or sent without delay to the officer in-charge of the nearest police station.

(8) All proceedings before the Balochistan Environmental Protection Tribunal shall be deemed to be judicial proceedings within the meaning of section 193 and 228 of the Pakistan Penal Code (Act XLV of 1860), and the Balochistan Environmental Protection Tribunal shall be deemed to be a court for the purpose of section 480 and 482 of the Code of Criminal Procedure, 1898 (Act V of 1898).

(9) No court other than Balochistan Environmental Protection Tribunal shall have or exercise any jurisdiction with respect to any matter to which the jurisdiction of Balochistan Environmental Protection Tribunal extends under this Act, the rules and regulations made thereunder.

(10) Where the Balochistan Environmental Protection Tribunal is satisfied that a complaint made to it under sub-section (3) is false and vexatious to the knowledge of the complainant, it may, by an order, direct the complainant to pay to the person complained against such compensatory costs which may extend to five hundred thousand rupees.

Appeals to the Environmental Tribunal.—

30. (1) Any person aggrieved by any order or direction of the Balochistan Environmental Protection Agency under any provision of this Act, and rules or regulations may prefer an appeal with the Balochistan Environmental Protection Tribunal within thirty days of the date of communication of the impugned order or direction to such person.

(2) An appeal to the Balochistan Environmental Protection Tribunal shall be in such form, contain such particulars and be accompanied by such fees as may be prescribed.

Appeals from orders of the Environmental Tribunal

31. (1) Any person aggrieved by any final order or by any sentence of the Balochistan Environmental Protection Tribunal passed under this Act may, within thirty days of communication of such order or sentence, prefer an appeal to the High Court.

(2) An appeal under sub-section (l) shall be heard by a Bench of not less than two Judges.

Jurisdiction of Environmental Magistrates.

32. (1) Notwithstanding anything contained in the Code of Criminal Procedure, 1898 (Act V of 1898), or any other law for the time being in force, but subject to the provisions of this Act, all contravention punishable under sub-section (2) of section 25 shall exclusively be trial-able by Environmental Magistrate especially empowered in this behalf under section 14 of the Code of Criminal Procedure, 185(Act No. V of 1898).

(2) An Environmental Magistrate shall be competent to impose any punishment specified in sub-sections (2) and (4) of section 25.

(3) An Environmental Magistrate shall not take cognizance of an offence trial able under sub-section (I) except on a complaint in writing by—

(a) the Balochistan Environmental Protection Agency, or Government Agency or a local council; and

(b) any aggrieved person.

Appeals from orders of Environmental Magistrates.

33. Any person convicted of any contravention of this Act or the rules or regulations by an Environmental Magistrate may, within thirty days from the date of his conviction, appeal to the Court of Sessions whose decision thereon shall be final.

Power to delegate.

34. *(1)* The Government of Balochistan may, by notification in the official Gazette, delegate any of its or of the Balochistan Environmental Protection Agency powers and functions under this Act and the rules and regulations to any Government Agency, local council or local authority.

(2) The Balochistan Environmental Protection Agency may also by notification in the official Gazette, delegate any of its powers or functions under this Act and the rules and regulations to EPA Regional or sub-offices. In case of nonexistence of its Regional/Sub-offices may delegate its powers or functions to any local council or local authority in the Province.

Power to give directions.

35. In the performance of its functions the Provincial Agency shall be bound by the direction given to it in writing by the Government.

Indemnity.

36. No suit, prosecution or other legal proceedings shall lie against the Government , the Council, the Balochistan Environmental Protection Agency, the Director-Generals of the Balochistan Environmental Protection Agency, members, officers, employees, experts, advisers, committees or consultants of the Balochistan Environmental Protection Agency or the Environmental Tribunal or Environmental Magistrates or any other person for anything which is in good faith done or intended to be done under this Act or the rules or regulations made thereunder.

Dues recoverable as arrears of land revenue.

37. Any dues recoverable by the Balochistan Environmental Protection Agency under this Act, or the rules or regulations shall be recoverable as arrears of land revenue.

Act to override other laws.

38. The provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force.

Power to make rules.

39. The Government of Balochistan may, by notification in the official Gazette, make rules for carrying out the purposes of this Act including rules for implementing the provisions of the international environmental Agreements, specified in the Schedule to this Act.

Power to amend the Schedule

40. The Government of Balochistan may, by notification in the official Gazette, amend the Schedule so as to add any entry thereato or modify or omit any entry therein.

Power to make regulations.

41. (1) For carrying out the purposes of this Act, the Balochistan Environmental Protection Agency may, by notification in the official Gazette and with the approval of the Government of Balochistan, make regulations not inconsistent with the provisions of this Act or the rules made thereunder.

(2) In particular and without prejudice to the generality of the foregoing power, such regulations may provide for

(a) submission of periodical reports, data or information by any Government agency, local authority or local council in respect of environmental matters;

(b) preparation of emergency contingency plans for coping with environmental hazards and pollution caused by accidents, natural disasters and

calamities;

(c) appointment of officers, advisers, experts, consultants and employees;

(d) levy of fees, rates and charges in respect of services rendered, actions taken and schemes implemented;

(e) monitoring and measurement of discharges and emissions;

(f) categorization of projects to which, and the manner in which, section 15 applies;

(g) laying down of guidelines for preparation of initial environmental examination and environmental impact assessment and Development of procedures for their filing, review and approval;

(h) providing procedures for handling hazardous substances; and

(i) installation of devices in, use of fuels by, and maintenance and testing of motor vehicles for control of air and noise pollution.

Repeal, savings and succession.

42. (1) The provision of Pakistan Environmental Protection Act 1997 (Act No.XXXIV of 1997) applicable to the Province of Balochistan are hereby repealed.

(2) Notwithstanding the repeal of the Pakistan Environmental Protection Act 1997 hereinafter called the repealed Act, any rules or regulations or appointments made, orders passed, notifications issued, powers delegated, contracts entered into, proceedings commenced, rights acquired liabilities incurred, penalties, rates, fees or charges levied, things done or action taken under any provisions of the repealed Act shall, so far as they are not inconsistent with the provisions of this Act be deemed to have been made, passed, issued, delegated, entered into, commenced, acquired, incurred, levied, done or taken under this Act, until they are repealed, rescind, withdrawn, cancelled, replaced or modified in accordance with the provisions of this Act.

(3) On the establishment of the Balochistan Environmental Protection Agency under this Act, all properties, assets and liabilities pertaining to the Balochistan Environmental Protection Agency established under repealed Act shall vest in and be the properties, assets and liabilities, as the case may be, of the Balochistan Environmental Protection Agency established under this Act.

(4) The Balochistan Environmental Protection Agency constituted under the repealed Act and existing immediately before the commencement of this Act shall be deemed to have been constituted under section 5 and the Director General and other officers and employees appointed in the said Agency shall be deemed to be Director General, officers and employees appointed under the Balochistan Civil Servant Act 1974.

(5) Notwithstanding the repeal of the Pakistan Environmental Protection Act 1997(Act No.XXXIV of 1997), all proceeding pending immediately before commencement of this Act, against any person under the repealed Act and rules, regulation or order made thereunder, or any other Law or rules shall continue under that Law and rules, in the manner proceeded thereunder.

SCHEDULE
(See section 39)

1. International Plant Protection Convention, Rome, 1951.

2. Plant Protection Agreement for the South-East Asia and Pacific Region (as amended), Rome, 1956.

3. Agreement for the Establishment of a Commission for Controlling the Desert Locust in the Eastern Region of its Distribution Area in South-West Asia (as amended), Rome, 1963.

4. Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Ramsar, 1971 and its amending Protocol, Paris, 1982.

5. London Convention on Ocean Dumping 1972.

6. Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), 1972.

7. MARPOL Convention on Prevention of Pollution from Ship, 1973/78

8. Convention on International Trade in Endangered Species of Wild Funa and Flora (CITES), Washington, 1973.

9. Convention on the Conservation of Migratory Species of Wild Animals, Bonn, 1979.

10. Convention on the Law of the Sea, Montego Bay, 1982.

11. Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985.

12. Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 and amendments thereto.

13. Agreement on the Network of Agriculture Centres in Asia and the Pacific, Bangkok, 1988.

14. Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal, Basel, 1989.

15. Convention on Biological Diversity, Rio de Janeiro, 1992.

16. United Nations Framework Convention on Climate Change, Rio De Janeiro, 1992.

17. Convention on the Protection and Use of Transboundary Watercourses and International Lakes, 17 March 1992.

18. The Rio Declaration on Environment and Development, 13 June 1992

19. London Amendment to Montreal Protocol on Substances that deplete the ozone layer, 10 Aug 1992

20. United Nations Convention on the Law of the Sea, 16 Nov 1994

21. Washington Declaration on Land Based Marine Pollution 1995.

22. UN Convention on Non-Navigational Uses of International Watercourses, 1995

23. Ban Amendment to the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 22 Sept 1995.

24. The Kyoto Protocol, 11 Dec 1997

25. The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 11 Sept 1998.

26. The Beijing Amendment to the Montreal Protocol on Substances that deplete the ozone layer, 1 Jan 2000

27. The Cartagena Protocol on Biosafety to the Convention on Biological Diversity, 29 Jan 2000.

28. Stockholm Convention on Persistent Organic Pollutants (POPs), 23 May 2001.

29. International Treaty on Plant Genetic Resources for Food and Agriculture, 3 Nov 2001.

30. Hong Kong International Convention For The Safe And Environmentally Sound Recycling Of Ships, 2009

STATEMENT OF OBJECTS AND REASONS.

After the 18th Constitutional amendments the subject of environment vide Notification No.4-9/2011-Min dated 29th June, 2011 stand devolved to the provinces with effect from 1st July, 2011. Even after the deletion of the subject of environment from the concurrent list the Pakistan Environmental Protection Act 1997 remained intact as per Article 270-AA, Sub-Article(6). However, there is provision that the province through an appropriate legislature/competent authority may alter, repeal and amend the laws related to the subject.

To regulate and effectively address the peculiar environmental issues of the province of Balochistan this act namely "Balochistan Environmental Protection Act 2012" is submitted as per provisions of the Article 270-AA, Sub-Article(6) of 18th Constitutional amendments.

(Mir Asghar Rind)

Minister for Environment Department

SECRETARY

Balochistan Provincial Assembly

Dated _____ November, 2012.

Annexure-II:
PAK-EPA (Review of IEE/EIA) Regulations 2000

PAKISTAN ENVIRONMENTAL PROTECTION AGENCY (REVIEW OF IEE AND EIA) REGULATIONS, 2000

S.R.O. 339 (1)/2001. - In exercise of the powers referred by section 33 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), Pakistan Environmental Protection Agency, with the approval of the Federal Government is pleased to make the following Rules, namely : -

1. Short title and commencement

(1) These regulations may be called the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

(2) They shall come into force at once.

2. Definitions

(1) In these regulations, unless there is anything repugnant in the subject or context –

(a) "Act" means the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997);

(b) "Director-General" means the Director-General of the Federal Agency;

(c) "EIA" means an environmental impact assessment as defined in section 2(xi);

(d) "IEE" means an initial environmental examination as defined in section 2(xxiv); and

(e) "section" means a section of the Act.

(2) All other words and expressions used in these regulations but not defined shall have the same meanings as are assigned to them in the Act.

3. Projects requiring an IEE

A proponent of a project falling in any category listed in Schedule I shall file an IEE with the Federal Agency, and the provisions of section 12 shall apply to such project.

4. Projects requiring an EIA

A proponent of a project falling in any category listed in Schedule II shall file an EIA with the Federal Agency, and the provisions of section 12 shall apply to such project.

5. Projects not requiring an IEE or EIA

(1) A proponent of a project not falling in any category listed in Schedules I and II shall not be required to file an IEE or EIA:

Provided that the proponent shall file –

(a) an EIA, if the project is likely to cause an adverse environmental effect;

(b) for projects not listed in Schedules I and II in respect of which the Federal Agency has issued guidelines for construction and operation, an application for approval accompanied by an undertaking and an affidavit that the aforesaid guidelines shall be fully complied with.

(2) Notwithstanding anything contained in sub-regulation (1), the Federal Agency may direct the proponent of a project, whether or not listed in Schedule I or II, to file an IEE or EIA, for reasons to be recorded in such direction:

Provided that no such direction shall be issued without the recommendation in writing of the Environmental Assessment Advisory Committee constituted under Regulation 23.

(3) The provisions of section 12 shall apply to a project in respect of which an IEE or EIA is filed under sub-regulation (1) or (2).

6. Preparation of IEE and EIA

(1) The Federal Agency may issue guidelines for preparation of an IEE or an EIA, including guidelines of general applicability, and sectoral guidelines indicating specific assessment requirements for planning, construction and operation of projects relating to particular sector.

(2) Where guidelines have been issued under sub-regulation (1), an IEE or EIA shall be prepared, to the extent practicable, in accordance therewith and the proponent shall justify in the IEE or EIA any departure therefrom.

7. Review Fees

The proponent shall pay, at the time of submission of an IEE or EIA, a non-refundable Review Fee to the Federal Agency, as per rates shown in Schedule III.

8. Filing of IEE and EIA

(1) Ten paper copies and two electronic copies of an IEE or EIA shall be filed with the Federal Agency.

(2) Every IEE and EIA shall be accompanied by –

(a) an application, in the form prescribed in Schedule IV; and

(b) copy of receipt showing payment of the Review Fee.

9. Preliminary scrutiny

(1) Within 10 working days of filing of the IEE or EIA, the Federal Agency shall –

(a) confirm that the IEE or EIA is complete for purposes of initiation of the review process; or

(b) require the proponent to submit such additional information as may be specified; or

(c) return the IEE or EIA to the proponent for revision, clearly listing the points requiring further study and discussion.

(2) Nothing in sub-regulation (1) shall prohibit the Federal Agency from requiring the proponent to submit additional information at any stage during the review process.

10. Public participation

(1) In the case of an EIA, the Federal Agency shall, simultaneously with issue of confirmation of completeness under clause (a) of sub-regulation (1) of Regulation 9, cause to be published in any English or Urdu national newspaper and in a local newspaper of general circulation in the area affected by the project, a public notice mentioning the type of project, its exact location, the name and address of the proponent and the places at which the EIA of the project can, subject to the restrictions in sub-section (3) of section 12, be accessed.

(2) The notice issued under sub-regulation (1) shall fix a date, time and place for public hearing of any comments on the project or its EIA.

(3) The date fixed under sub-regulation (2) shall not be earlier than 30 days from the date of publication of the notice.

(4) The Federal Agency shall also ensure the circulation of the EIA to the concerned Government Agencies and solicit their comments thereon.

(5) All comments received by the Federal Agency from the public or any Government Agency shall be collated, tabulated and duly considered by it before decision on the EIA.

(6) The Federal Agency may issue guidelines indicating the basic techniques and measures to be adopted to ensure effective public consultation, involvement and participation in EIA assessment.

11. Review

(1) The Federal Agency shall make every effort to carry out its review of the IEE within 45 days, and of the EIA within 90 days, of issue of confirmation of completeness under Regulation 9.

(2) In reviewing the IEE or EIA, the Federal Agency shall consult such Committee of Experts as may be constituted for the purpose by the Director-General, and may also solicit views of the sectoral Advisory Committee, if any, constituted by the Federal Government under sub-section (6) of section 5.

(3) The Director-General may, where he considers it necessary, constitute a committee to inspect the site of the project and submit its report on such matters as may be specified.

(4) The review of the IEE or EIA by the Federal Agency shall be based on quantitative and qualitative assessment of the documents and data furnished by the proponent, comments from the public and Government Agencies received under Regulation 10, and views of the committees mentioned in sub-regulations (2) and (3) above.

12. Decision

On completion of the review, the decision of the Federal Agency shall be communicated to the proponent in the form prescribed in Schedule V in the case of an IEE, and in the form prescribed in Schedule VI in the case of an EIA.

13. Conditions of approval

(1) Every approval of an IEE or EIA shall, in addition to such conditions as may be imposed by the Federal Agency, be subject to the condition that the project shall be designed and constructed, and mitigatory and other measures adopted, strictly in accordance with the IEE/EIA, unless any variation thereto have been specified in the approval by the Federal Agency.

(2) Where the Federal Agency accords its approval subject to certain conditions, the proponent shall –

(a) before commencing construction of the project, acknowledge acceptance of the stipulated conditions by executing an undertaking in the form prescribed in Schedule VII;

(b) before commencing operation of the project, obtain from the Federal Agency written confirmation that the conditions of approval, and the requirements in the IEE/EIA relating to design and construction, adoption of mitigatory and other measures and other relevant matters, have been duly complied with.

14. Confirmation of compliance

(1) The request for confirmation of compliance under clause (b) of sub-regulation (2) of Regulation 13 shall be accompanied by an Environmental Management Plan indicating the measures and procedures proposed to be taken to manage or mitigate the environmental impacts for the life of the project, including provisions for monitoring, reporting and auditing.

(2) Where a request for confirmation of compliance is received from a proponent, the Federal Agency may carry out such inspection of the site and plant and machinery and seek such additional information from the proponent as it may deem fit:

Provided that every effort shall be made by the Federal Agency to provide the requisite confirmation or otherwise within 15 days of receipt of the request, with complete information, from the proponent.

(3) The Federal Agency may, while issuing the requisite confirmation of compliance, impose such other conditions as the Environmental Management Plan, and the operation, maintenance and monitoring of the project as it may deem fit, and such conditions shall be deemed to be included in the conditions to which approval of the project is subject.

15. Deemed approval

The four-month period for communication of decision stipulated in sub-section (4) of section 12 shall commence from the date of filing of an IEE or EIA in respect of which confirmation of completeness is issued by the Federal Agency under clause (a) of sub-regulation (1) of Regulation 9.

16. Extension in review period

Where the Federal Government in a particular case extends the four-month period for communication of approval prescribed in sub-section (5) of section 12, it shall, in consultation with the Federal Agency, indicate the various steps of the review process to be taken during the extended period, and the estimated time required for each step.

17. Validity period of approval

(1) The approval accorded by a Federal Agency under section 12 read with Regulation 12 shall be valid, for commencement of construction, for a period of three years from the date of issue.

(2) If construction is commenced during the initial three year validity period, the validity of the approval shall stand extended for a further period of three years from the date of issue.

(3) After issue of confirmation of compliance, the approval shall be valid for a period of three years from the date thereof.

(4) The proponent may apply to the Federal Agency for extension in the validity periods mentioned in sub-regulations (1), (2) and (3), which may be granted by the Federal Agency in its discretion for such period not exceeding three years at a time, if the conditions of the approval do not require significant change:

Provided that the Federal Agency may require the proponent to submit a fresh IEE or EIA, if in its opinion changes in location, design, construction and operation of the project so warrant.

18. Entry and inspection

(1) For purposes of verification of any matter relating to the review or to the conditions of approval of an IEE or EIA prior to, during or after commencement of construction or operation of a project, duly authorized staff of the Federal Agency shall be entitled to enter and inspect the project site, factory building and plant and equipment installed therein.

(2) The proponent shall ensure full cooperation of the project staff at site to facilitate the inspection, and shall provide such information as may be required by the Federal Agency for this purpose and pursuant thereto.

19. Monitoring

(1) After issue of approval, the proponent shall submit a report to the Federal Agency on completion of construction of the project.

(2) After issue of confirmation of compliance, the proponent shall submit an annual report summarizing operational performance of the project, with reference to the conditions of approval and maintenance and mitigatory measures adopted by the project.

(3) To enable the Federal Agency to effectively monitor compliance with the conditions of approval, the proponent shall furnish such additional information as the Federal Agency may require.

20. Cancellation of approval

(1) Notwithstanding anything contained in these Regulations, if, at any time, on the basis of information or report received or inspection carried out, the Federal Agency is of the opinion that the conditions of an approval have not been complied with, or that the information supplied by a proponent in the approved IEE or EIA is incorrect, it

shall issue notice to the proponent to show cause, within two weeks of receipt thereof, why the approval should not be cancelled.

(2) If no reply is received or if the reply is considered unsatisfactory, the Federal Agency may, after giving the proponent an opportunity of being heard:

(i) require the proponent to take such measures and to comply with such conditions within such period as it may specify, failing which the approval shall stand cancelled; or

(ii) cancel the approval.

(3) On cancellation of the approval, the proponent shall cease construction or operation of the project forthwith.

(4) Action taken under this Regulation shall be without prejudice to any other action that may be taken against the proponent under the Act or rules or regulations or any other law for the time being in force.

21. Registers of IEE and EIA projects

Separate Registers to be maintained by the Federal Agency for IEE and EIA projects under sub-section (7) of section 12 shall be in the form prescribed in Schedule VIII.

22. Environmentally sensitive areas

(1) The Federal Agency may, by notification in the official Gazette, designate an area to be an environmentally sensitive area.

(2) Notwithstanding anything contained in Regulations 3, 4 and 5, the proponent of a project situated in an environmentally sensitive area shall be required to file an EIA with the Federal Agency.

(3) The Federal Agency may from time to time issue guidelines to assist proponents and other persons involved in the environmental assessment process to plan and prepare projects located in environmentally sensitive areas.

(4) Where guidelines have been issued under sub-regulation (3), the projects shall be planned and prepared, to the extent practicable, in accordance therewith and any departure therefrom justified in the EIA pertaining to the project.

23. Environmental Assessment Advisory Committee

For purposes of rendering advice on all aspects of environmental assessment, including guidelines, procedures and categorization of projects, the Director-General shall constitute an Environmental Assessment Advisory Committee comprising –

(a) Director EIA, Federal Agency … Chairman

(b)	One representative each of the Provincial Agencies	…	Members
(c)	One representative each of the Federal Planning Commission and the Provincial Planning and Development Departments	…	Members
(d)	Representatives of industry and non-Governmental organizations, and legal and other experts	…	Members

24. Other approvals

Issue of an approval under section 12 read with Regulation 12 shall not absolve the proponent of the duty to obtain any other approval or consent that may be required under any law for the time being in force.

SCHEDULE I
(*See* Regulation 3)

List of projects requiring an IEE

A. Agriculture, Livestock and Fisheries

1. Poultry, livestock, stud and fish farms with total cost more than Rs.10 million

2. Projects involving repacking, formulation or warehousing of agricultural products

B. Energy

1. Hydroelectric power generation less than 50 MW

2. Thermal power generation less than 200 KW

3. Transmission lines less than 11 KV, and large distribution projects

4. Oil and gas transmission systems

5. Oil and gas extraction projects including exploration, production, gathering systems, separation and storage

6. Waste-to-energy generation projects

C. Manufacturing and processing

1. Ceramics and glass units with total cost more than Rs.50 million

2. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost less than Rs.100 million

3. Man-made fibers and resin projects with total cost less than Rs.100 million

4. Manufacturing of apparel, including dyeing and printing, with total cost more than Rs.25 million

5. Wood products with total cost more than Rs.25 million

D. Mining and mineral processing

1. Commercial extraction of sand, gravel, limestone, clay, sulphur and other minerals not included in Schedule II with total cost less than Rs.100 million

2. Crushing, grinding and separation processes

3. Smelting plants with total cost less than Rs.50 million

E. Transport

1. Federal or Provincial highways (except maintenance, rebuilding or reconstruction of existing metalled roads) with total cost less than Rs.50 million

2. Ports and harbor development for ships less than 500 gross tons

F. Water management, dams, irrigation and flood protection

1. Dams and reservoirs with storage volume less than 50 million cubic meters of surface area less than 8 square kilometers

2. Irrigation and drainage projects serving less than 15,000 hectares

3. Small-scale irrigation systems with total cost less than Rs.50 million

G. Water supply and treatment

Water supply schemes and treatment plants with total cost less than Rs.25 million

H. Waste disposal

Waste disposal facility for domestic or industrial wastes, with annual capacity less than 10,000 cubic meters

I. Urban development and tourism

1. Housing schemes

2. Public facilities with significant off-site impacts (e.g. hospital wastes)

3. Urban development projects

J. Other projects

Any other project for which filing of an IEE is required by the Federal Agency under sub-regulation (2) of Regulation 5

SCHEDULE II

(*See* Regulation 4)

List of projects requiring an EIA

A. Energy

1. Hydroelectric power generation over 50 MW
2. Thermal power generation over 200 MW
3. Transmission lines (11 KV and above) and grid stations
4. Nuclear power plans
5. Petroleum refineries

B. Manufacturing and processing

1. Cement plants
2. Chemicals projects
3. Fertilizer plants
4. Food processing industries including sugar mills, beverages, milk and dairy products, with total cost of Rs.100 million and above
5. Industrial estates (including export processing zones)
6. Man-made fibers and resin projects with total cost of Rs.100 M and above
7. Pesticides (manufacture or formulation)
8. Petrochemicals complex
9. Synthetic resins, plastics and man-made fibers, paper and paperboard, paper pulping, plastic products, textiles (except apparel),printing and publishing, paints and dyes, oils and fats and vegetable ghee projects, with total cost more than Rs.10 million
10. Tanning and leather finishing projects

C. Mining and mineral processing

1. Mining and processing of coal, gold, copper, sulphur and precious stones
2. Mining and processing of major non-ferrous metals, iron and steel rolling
3. Smelting plants with total cost of Rs.50 million and above

D. Transport

1. Airports

2. Federal or Provincial highways or major roads (except maintenance, rebuilding or reconstruction of existing roads) with total cost of Rs.50 million and above

3. Ports and harbor development for ships of 500 gross tons and above

4. Railway works

E. Water management, dams, irrigation and flood protection

1. Dams and reservoirs with storage volume of 50 million cubic meters and above or surface area of 8 square kilometers and above

2. Irrigation and drainage projects serving 15,000 hectares and above

F. Water supply and treatment

Water supply schemes and treatment plants with total cost of Rs.25 million and above

G. Waste Disposal

1. Waste disposal and/or storage of hazardous or toxic wastes (including landfill sites, incineration of hospital toxic waste)

2. Waste disposal facilities for domestic or industrial wastes, with annual capacity more than 10,000 cubic meters

H. Urban development and tourism

1. Land use studies and urban plans (large cities)

2. Large-scale tourism development projects with total cost more than Rs.50 million

I. Environmentally Sensitive Areas

All projects situated in environmentally sensitive areas

J. Other projects

1. Any other project for which filing of an EIA is required by the Federal Agency under sub-regulation (2) of Regulation 5.

2. Any other project likely to cause an adverse environmental effect

SCHEDULE III
(See Regulation 7)

IEE/EIA Review Fees

Total Project Cost	IEE	EIA
Upto Rs.5,000,000	NIL	NIL
Rs.5,000,001 to 10,000,000	Rs.10,000	Rs.15,000
Greater than Rs.10,000,000	Rs.15,000	Rs.30,000

SCHEDULE IV

[*See* Regulation 8(2)(a)]

Application Form

1.	Name and address of proponent		Phone: Fax: Telex:	
2.	Description of project			
3.	Location of project			
4.	Objectives of project			
5.	IEE/EIA attached?	IEE/EIA :	Yes/No	
6.	Have alternative sites been considered and reported in IEE/EIA?		Yes/No	
7.	Existing land use		Land requirement	
8.	Is basic site data available, or has it been measured?	(only tick yes if the data is reported in the IEE/EIA) Meterology (including rainfall) Ambient air quality Ambient water quality Ground water quality	<u>Available</u> Yes/No Yes/No Yes/No Yes/No	<u>Measured</u> Yes/No Yes/No Yes/No Yes/No
9.	Have estimates of the following been reported?	Water balance Solid waste disposal Liquid waste treatment	<u>Estimated</u> Yes/No Yes/No Yes/No	<u>Reported</u> Yes/No Yes/No Yes/No
10.	Source of power		Power requirement	
11.	Labour force (number)	Construction: Operation:		

<u>Verification.</u> I do solemnly affirm and declare that the information given above and contained in the attached IEE/EIA is true and correct to the best of my knowledge and belief.

Date _____

Signature, name and _____
designation of proponent
(with official stamp/seal)

SCHEDULE V

[*See* Regulation 12]

Decision on IEE

1. Name and address of proponent _____

   _____

2. Description of project _____

3. Location of project _____

4. Date of filing of IEE _____

5. After careful review of the IEE, the Federation Agency has decided –

   (a) to accord its approval, subject to the following conditions:

   _____
   _____

   or (b) that the proponent should submit an EIA of the project, for the following reasons –

   _____
   _____

   [Delete (a) or (b), whichever is inapplicable]

Dated _____

Tracking no.___

Director-General
Federal Agency
(with official stamp/seal)

SCHEDULE VI

[*See* Regulation 12]

Decision on EIA

1. Name and address of proponent _____

   _____

2. Description of project _____

3. Location of project _____

4. Date of filing of EIA _____

5. After careful review of the EIA, and all comments thereon, the Federation Agency has decided –

   (a) to accord its approval, subject to the following conditions:

   _____
   _____

   or (b) that the proponent should submit an EIA with the following modifications-

   _____
   _____

   or (c) to reject the project, being contrary to environmental objectives, for the following reasons:

   _____
   _____

   [Delete (a)/(b)/(c), whichever is inapplicable]

Dated _____

Tracking no.___

Director-General
Federal Agency
(with official stamp/seal)

SCHEDULE VII

[*See* Regulation 13(2)]

Undertaking

I, (full name and address) as proponent for (name, description and location of project) do hereby solemnly affirm and declare that I fully understand and accept the conditions contained in the approval accorded by the Federal Agency bearing tracking no._____ dated _____, and undertake to design, construct and operate the project strictly in accordance with the said conditions and the IEE/EIA.

Date _____

Signature, name and _____
designation of proponent
(with official stamp/seal)

Witnesses
(full names and addresses)

(1) _____

(2) _____

SCHEDULE VIII
(*See* Regulation 21)
Form of Registers for IEE and EIA projects

S. No.	Description	Relevant Provisions
1	2	3
1.	Tracking number	
2.	Category type (as per Schedules I and II)	
3.	Name of proponent	
4.	Name and designation of contact person	
5.	Name of consultant	
6.	Description of project	
7.	Location of project	
8.	Project capital cost	
9.	Date of receipt of IEE/EIA	
10.	Date of confirmation of completeness	
11.	Approval granted (Yes/No)	
12.	Date of approval granted or refused	
13.	Conditions of approval/reasons for refusal	
14.	Date of Undertaking	
15.	Date of extension of approval validity	
16.	Period of extension	
17.	Date of commencement of construction	
18.	Date of issue of confirmation of compliance	
19.	Date of commencement of operations	
20.	Dates of filing of monitoring reports	
21.	Date of cancellation, if applicable	

Annexure-III:
National Environmental Quality Standards (NEQS),

REGISTERED No. M-302
L. 7646

The Gazette ***of Pakistan***

EXTRAORDINARY
PUBLISHED BY AUTHORITY

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ISLAMABD, THURSDAY, AUGUST 10, 2000

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PART-II

Statutory Notification (S.R.O)

GOVERNMENT OF PAKISTAN

MINISTRY OF ENVIRONMENT, LOCAL GOVERNMENT AND RURAL DEVELOPMENT

NOTIFICATION

Islamabad, the 8th August 2000

S.R.O. 549 (I)/2000.___ In exercise of the powers conferred under clause (c) of sub-section (1) of section of 6 of the Pakistan environmental Protection Act. 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to direct that the following further amendments shall be made in its Notification No. S.R.O. 742(I)/93, dated the 24th August, 1993, namely: ___

In the aforesaid Notification, in paragraph 2._____

[4138(2000)/Ex.GAZ]

Price : Rs. 5.00

(1) for Annex, I the following shall be substituted, namely:_____

Annex-I

"NATIONAL ENVIRONMENTAL QUALITY STANDARDS FOR MUNICIPAL AND LIQUID INDUSTRIAL EFFLUENTS (mg/I, UNLESS OTHERWISE DEFINED)

S. No.	Parameter	Existing Standards	Revised Standards: Into Inland Waters	Revised Standards: Into Sewage Treatment (5)	Revised Standards: Into Sea ( )
1	2	3	4	5	6
1.	Temperature or Temperature Increase *	40^0C	≤3°C	≤3°C	≤3°C
2.	pH value (H^+) .	6-10	6-9	6-9	6-9
3.	Biochemical Oxygen Demand $(BOD)_5$ at 20^0C (1)	80	80	250	80**
4.	Chemical Oxygen Demand (COD) (1)	150	150	400	400
5.	Total Suspended Solids (TSS)	150	200	400	200
6.	Total Dissolved Solids (TDS)	3500	3500	3500	3500
7.	Oil and Grease	10	10	10	10
8.	Phenolic compounds (as phenol)	0.1	0.1	0.3	0.3
9.	Chloride (as $C1^-$)	1000	1000	1000	SC***
10.	Fluoride (as F^-)	20	10	10	10
11.	Cyanide (as CN^-) total ..	2	1.0	1.0	1.0
12.	An-ionic detergents (as MBAS) (2)	20	20	20	20
13.	Sulphate (SO_4^{2-})	600	600	1000	SC***
14.	Sulphide (S^{2-})	1.0	1.0	1.0	1.0
15.	Ammonia (NH_3)	40	40	40	40
16.	Pesticides (3)	0.15	0.15	0.15	0.15

1	2	3	4	5	6
17.	Cadmium (4)	0.1	0.1	0.1	0.1
18.	Chromium (trivalent and hexavalent (4).. ..	1.0	1.0	1.0	1.0
19.	Cooper (4)	1.0	1.0	1.0	1.0
20.	Lead (4)	0.5	0.5	0.5	0.5
21.	Mercury (4)	0.01	0.01	0.01	0.01
22.	Selenium (4)	0.5	0.5	0.5	0.5
23.	Nickel (4)	1.0	1.0	1.0	1.0
24.	Silver (4)	1.0	1.0	1.0	1.0
25.	Total toxic metals	2.0	2.0	2.0	2.0
26.	Zinc	5.0	5.0	5.0	5.0
27.	Arsenic (4)	1.0	1.0	1.0	1.0
28.	Barium (4)	1.5	1.5	1.5	1.5
29.	Iron	2.0	8.0	8.0	8.0
30.	Manganese	1.5	1.5	1.5	1.5
31.	Boron (4)	6.0	6.0	6.0	6.0
32.	Chlorine	1.0	1.0	1.0	1.0

Explanations:

1. Assuming minimum dilution 1:10 on discharge, lower ratio would attract progressively stringent standards to be determined by the Federal 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.

2. Methylene Blue Active Substances; assuming surfactant as biodegradable.

3. Pesticides include herbicides, fungicides, and insecticides.

4. Subject to total toxic metals discharge should not exceed level given at S. N. 25.

5. Applicable only when and where sewage treatment is operational and BOD_5=80mg/I is achieved by the sewage treatment system.

6. Provided discharge is not at shore and not within 10 miles of mangrove or other important estuaries.

* The effluent should not result in temperature increase of more than 3^0C at the edge of the zone where initial mixing and dilution take place in the receiving body. In case zone is not defined, use 100 meters from the point of discharge.

** The value for industry is 200 mg/I

*** Discharge concentration at or below sea concentration (SC).

Note:_____ 1. Dilution of liquid effluents to bring them to the NEQS limiting values is not permissible through fresh water mixing with the effluent before discharging into the environment.

2. The concentration of pollutants in water being used will be substracted from the effluent for calculating the NEQS limits" and

(2) for Annex-II the following shall be substituted, namely:____

Annex-II

"NATIONAL ENVIRONMENTAL QUALITY STANDARDS FOR INDUSTRIAL GASEOUS EMISSION (mg/Nm^3, UNLESS OTHERWISE DEFINED)."

S. No.	Parameter	Source of Emission	Existing Standards	Revised Standards
1	2	3	4	5
1.	Smoke	Smoke opacity not to exceed	40% or 2 Ringlemann Scale	40% or 2 Ringlemann Scale or equivalent smoke number
2.	Particulate malter	(a) Boilers and Furnaces		
	(1)	(i) Oil fired	300	300
		(ii) Coal fired	500	500
		(iii) Cement Kilns	200	300
		(b) Grinding, crushing, Clinker coolers and Related processes, Metallurgical Processes, converter, blast furnaces and cupolas.	500	500
3.	Hydrogen Chloride	Any	400	400

1	2	3	4	5
4.	Chlorine	Any	150	150
5.	Hydrogen Fluoride	Any	150	150
6.	Hydrogen Sulphide	Any	10	10
7.	Sulphur Oxides (2) (3)	Sulfuric acid/Sulphonic acid plants		
		Other Plants except power Plants operating on oil and coal	400	1700
8.	Carbon Monoxide	Any	800	800
9.	Lead	Any	50	50
10.	Mercury	Any	10	10
11.	Cadmium	Any	20	20
12.	Arsenic	Any	20	20
13.	Copper	Any	50	50
14.	Antimony	Any	20	20
15.	Zinc	Any	200	200
16.	Oxides of Nitrogen	Nitric acid manufacturing unit.	400	3000
	(3)	Other plants except power plants operating on oil or coal:		
		Gas fired	400	400
		Oil fired	-	600
		Coal fired	-	1200

Explanations:-

1. Based on the assumption that the size of the particulate is 10 micron or more.

2. Based on 1 percent Sulphur content in fuel oil. Higher content of Sulphur will case standards to be pro-rated.

3. In respect of emissions of Sulphur dioxide and Nitrogen oxides, the power plants operating on oil and coal as fuel shall in addition to National Environmental Quality Standards (NEQS) specified above, comply with the following standards:-

A. **Sulphur Dioxide**

Sulphur Dioxide Background levels Micro-gram per cubic meter (ug/m^3) Standards.

Background Air Quality (SO_2 Basis)	Annual Average	Max. 24-hours Interval	Criterion I Max. SO_2 Emission (Tons per Day Per Plant)	Criterion II Max. Allowable ground level increment to ambient (ug/m^3) (One year Average)
Unpolluted	<50	<200	500	50
Moderately Polluted*				
Low	50	200	500	50
High	100	400	100	10
Very Polluted**	>100	>400	100	10

* For intermediate values between 50 and 100 ug/m^3 linear interpolations should be used.

** No projects with Sulphur dioxide emissions will be recommended.

B. Nitrogen Oxide

Ambient air concentrations of Nitrogen oxides, expressed as NO_x should not be exceed the following:-

Annual Arithmetic Mean 100ug/m^3 (0.05 ppm)

Emission level for stationary source discharge before missing with the atmosphere, should be maintained as follows:-

For fuel fired steam generators as Nanogram (10^0-gram) per joule of heat input:

Liquid fossil fuel	130
Solid fossil fuel	300
Lignite fossil fuel	260

Note:- Dilution of gaseous emissions to bring them to the NEQS limiting value is not permissible through excess air mixing blowing before emitting into the environment.

[File No. 14(3)/98-TO-PEPC.]

HAFIZ ABDULAH AWAN
DEPUTY SECRETARY (ADMN)

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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

MINISTRY OF ENVIRONMENT

NOTIFICATIONS

Islamabad, the 18th October, 2010

S. R. O. 1062(I)/2010.—In exercise of the powers conferred under clause (c) of sub-section (I) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Environmental Quality Standards for Ambient Air.

National Environmental Quality Standards for Ambient Air

Pollutants	Time-weighted average	Concentration in Ambient Air		Method of measurement
		Effective from 1st July, 2010	Effective from 1st January 2013	
Sulphur Dioxide (SO_2)	Annual Average* 24 hours**	80 $\mu g/m^3$ 120 $\mu g/m^3$	80 $\mu g/m^3$ 120 $\mu g/m^3$	-Ultraviolet Fluorescence method
Oxides of Nitrogen as (NO)	Annual Average* 24 hours**	40 $\mu g/m^3$ 40 $\mu g/m^3$	40 $\mu g/m^3$ 40 $\mu g/m^3$	- Gas Phase Chemiluminescence

[2944(2010)/Ex. Gaz.] *Price: Rs. 5.00*

Pollutants	Time-weighted average	Concentration in Ambient Air: Effective from 1st July, 2010	Concentration in Ambient Air: Effective from 1st January 2013	Method of measurement
Oxides of Nitrogen as (NO_2)	Annual Average*	40 $\mu g/m^3$	40 $\mu g/m^3$	- Gas Phase Chemiluminescence
	24 hours**	80 $\mu g/m^3$	80 $\mu g/m^3$	
O^3	1 hour	180 $\mu g/m^3$	130 $\mu g/m^3$	-Non dispersive UV absorption method
Suspended Particulate Matter (SPM)	Annual Average*	400 $\mu g/m^3$	360 $\mu g/m^3$	- High Volume Sampling, (Average flow rate not less than 1.1 m3/minute).
	24 hours**	550 $\mu g/m^3$	500 $\mu g/m^3$	
Respirable Particulate Matter. PM_{10}	Annual Average*	200 $\mu g/m^3$	120 $\mu g/m^3$	-β Ray absorption method
	24 hours**	250 $\mu g/m^3$	150 $\mu g/m^3$	
Respirable Particulate Matter. $PM_{2.5}$	Annual Average*	25 $\mu g/m^3$	15 $\mu g/m^3$	-β Ray absorption method
	24 hours**	40 $\mu g/m^3$	35 $\mu g/m^3$	
	1 hour	25 $\mu g/m^3$	15 $\mu g/m^3$	
Lead Pb	Annual Average*	1.5 $\mu g/m^3$	1 $\mu g/m^3$	- ASS Method after sampling using EPM 2000 or equivalent Filter paper
	24 hours**	2 $\mu g/m^3$	1.5 $\mu g/m^3$	
Carbon Monoxide (CO)	8 hours**	5 mg/m^3	5 mg/m^3	- Non Dispersive Infra Red (NDIR) method
	1 hour	10 mg/m^3	10 mg/m^3	

*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% of the in a year. 2% of the time. it may exceed but not on two consecutive days.

S. R. O. 1063(I)/2010.— In exercise of the powers conferred under clause (c) of sub-section (1) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Standards for Drinking Water Quality.

National Standards for Drinking Water Quality

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Bacterial			
All water intended for drinking (e.Coli or Thermotolerant Coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water entering the distribution system (E.Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water in the distribution system (E. coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12-month period.	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12 month period.	Most Asian countries also follow WHO standards
Physical			
Colour	≤ 15 TCU	≤ 15 TCU	
Taste	Non objectionable/Acceptable	Non objectionable/Acceptable	
Odour	Non objectionable/Acceptable	Non objectionable/Acceptable	
Turbidity	〈 5 NTU	〈 5 NTU	
Total hardness as $CaCO_3$	< 500 mg/l	---	
TDS	〈 1000	〈 1000	
pH	6.5 – 8.5	6.5 – 8.5	
Chemical			
Essential Inorganic	***mg/Litre***	***mg/Litre***	
Aluminium (Al) mg/l	≤ 0.2	0.2	

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Antimony (Sb)	≤ 0.005 (P)	0.02	
Arsenic (As)	≤ 0.05 (P)	0.01	Standard for Pakistan similar to most Asian developing countries
Barium (Ba)	0.7	0.7	
Boron (B)	0.3	0.3	
Cadmium (Cd)	0.01	0.003	Standard for Pakistan similar to most Asian developing countries
Chloride (Cl)	< 250	250	
Chromium (Cr)	≤ 0.05	0.05	
Copper (Cu)	2	2	
Toxic Inorganic	***mg/Litre***	***mg/Litre***	
Cyanide (CN)	≤ 0.05	0.07	Standard for Pakistan similar to Asian developing countries
Fluoride (F)*	≤ 1.5	1.5	
Lead (Pb)	≤ 0.05	0.01	Standard for Pakistan similar to most Asian developing countries
Manganese (Mn)	≤ 0.5	0.5	
Mercury (Hg)	≤ 0.001	0.001	
Nickel (Ni)	≤ 0.02	0.02	
Nitrate (NO_3)*	≤ 50	50	
Nitrite (NO_2)*	≤ 3 (P)	3	
Selenium (Se)	0.01(P)	0.01	
Residual chlorine	0.2-0.5 at consumer end 0.5-1.5 at source	—	
Zinc (Zn)	5.0	3	Standard for Pakistan similar to most Asian developing countries

* indicates priority health related inorganic constituents which need regular monitoring.

Properties/Parameters	Standard Values for Pakistan	Who Standards	Remarks
Organic			
Pesticides mg/L		PSQCA No. 4639-2004, Page No. 4 Table No. 3 Serial No. 20- 58 may be consulted.***	Annex II
Phenolic compounds (as Phenols) mg/L		≤ 0.002	
Polynuclear aromatic hydrocarbons (as PAH) g/L		0.01 (By GC/MS method)	
Radioactive			
Alpha Emitters bq/L or pCi	0.1	0.1	
Beta emitters	1	1	

*** PSQCA: Pakistan Standards Quality Control Authority.

Proviso:

The existing drinking water treatment infrastructure is not adequate to comply with WHO guidelines. The Arsenic concentrations in South Punjab and in some parts of Sindh have been found high then Revised WHO guidelines. It will take some time to control arsenic through treatment process. Lead concentration in the proposed standards is higher than WHO Guidelines. As the piping system for supply of drinking water in urban centres are generally old and will take significant resources and time to get them replaced. In the recent past, Lead was completely phased out from petroleum products to cut down Lead entering into environment. These steps will enable to achieve WHO guidelines for Arsenic, Lead, Cadmium and Zinc. However, for bottled water, WHO limits for Arsenic, Lead, Cadmium and Zinc will be applicable and PSQCA Standards for all the remaining parameters.

S. R. O. 1064(I)/2010.—In exercise of the powers conferred under clause (c) of sub-section (1) of section 6 of the Pakistan Environmental Protection Act, 1997 (XXXIV of 1997), the Pakistan Environmental Protection Agency, with the prior approval of the Pakistan Environmental Protection Council, is pleased to establish the following National Environmental Quality Standards for Noise.

National Environmental Quality Standards for Noise

S. No.	Category of Area / Zone	Effective from 1st July, 2010		Effective from 1st July, 2012	
		Limit in dB(A) Leq *			
		Day Time	Night Time	Day Time	Night Time
1.	Residential area (A)	65	50	55	45
2.	Commercial area (B)	70	60	65	55
3.	Industrial area (C)	80	75	75	65
4.	Silence Zone (D)	55	45	50	45

Note: 1. Day time hours: 6.00 a. m to 10.00 p. m.

2. Night time hours: 10.00 p. m. to 6.00 a.m.

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(A) Leq: Time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

[No. F. I(12)/2010-11-General.]

MUHAMMAD KHALIL AWAN,
Section Officer (PEPC).

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Annexure – IV:
PPL QHSE Policy

Quality, Health, Safety & Environment Policy

Pakistan Petroleum Limited (PPL), being a responsible exploration and production company, undertakes that Quality, Health, Safety and Environment (QHSE) is an integral part of its business planning and operational activities.

Line management is accountable to ensure QHSE compliance and demonstrates its pivotal leadership role in inculcating QHSE culture within the organization. Whereas, all company's and contractor's employees are responsible to implement QHSE Management System in their domain for own wellbeing as well as mutual benefit of colleagues, contractors, community and visitors.

To carry out this policy, PPL shall:

- Create a safe work place at all its operated assets / locations by proactively identifying hazards, assessing risks and taking effective control measures before an accident happens
- Disseminate the principle that all occupational illnesses, injuries, property or environmental damage and process related incidents are preventable
- Ensure minimum environmental footprint of its business activities through resource conservation and effective waste management
- Conduct detailed investigation through cross functional team in case an incident occurs for determining the root cause(s) and applying preventive measures
- Continually improve QHSE Management System to provide a comprehensive framework, including but not limited to quality assurance, quality control, inspections, audits, trainings, management reviews, emergency response, sustainability practices, contractor's and process safety management
- Evaluate QHSE performance against set objectives and key performance indicators and openly communicate to all internal and external stakeholders

All employees and contractors must be committed to maintaining and continually improving QHSE standards over and above the applicable legal requirements in all areas of operations for value addition to customers and shareholders.

Syed Wamiq Bokhari
Managing Director and Chief Executive Officer

August 2015

Rev: 03

پالیسی برائے معیار، صحت، تحفّظ و ماحول

پاکستان پٹرولیئم لمیٹڈ (پی پی ایل) تیل وگیس کی صنعت کی ایک ذمہ دار دریافتی و پیداواری کمپنی ہونے کے ناطے اس عزم کی توثیق کرتی ہے کہ معیار، صحت، تحفظ و ماحول (QHSE) اسکی کاروباری منصوبہ بندی اور متعلقہ سرگرمیوں کا لازمی جز ہیں۔

کمپنی کی انتظامیہ QHSE کے رواج کو فروغ دینے کے لئے اپنی قائدانہ صلاحیتوں کو بروئے کار لاتی ہے اور اس کے اطلاق کو یقینی بنانے کی جوابدہ ہے۔ جبکہ کمپنی اور ٹھیکیداران کے ملازمین اپنے اپنے دائرۂ کار میں رہتے ہوئے ذاتی اور باہمی فلاح کے لئے QHSE کے موئثر انتظامی نظام کے نفاذ کے ذمہ دار ہیں۔

اس پالیسی کے موئثر نفاذ کے لئے پی پی ایل مندرجہ ذیل اقدامات کرے گی:

- اپنے تمام انتظامی اثاثوں/کام کی جگہوں کو محفوظ بنانے کے لئے ممکنہ خطرات کی پیشگی نشاندہی اور حادثات کے وقوع پذیر ہونے سے پہلے ان کے بہتر تدارک کے لئے موئثر اقدامات کرے گی
- اس اصول کی تشہیر کی جائے گی کہ کام کے دوران حادثات و بیماریاں، املاک، ماحولیاتی نقصان اور پلانٹس کی تکنیکی خرابیوں کی روک تھام ممکن ہے
- وسائل کی بقاء اور فاضل مادوں کے اخراج کے بہتر انتظام کے ذریعے اپنی کاروباری سرگرمیوں کے منفی ماحولیاتی اثرات کو کم کرنے کو یقینی بنایا جائے گا
- کسی حادثے کے وقوع پذیر ہونے کی صورت میں بین الشعبہ جاتی ٹیم کے ذریعے اس کی تفصیلی تحقیقات کرائی جائے تاکہ حادثے کی بنیادی وجوہات کا تعین ہو اور ایسی صورتحال کے دوبارہ رونما ہونے سے قبل ہی حفاظتی اقدامات کئے جاسکیں
- QHSE کے انتظامی نظام کو مسلسل بہتر بنایا جائے تاکہ نہ صرف کام کے معیار، جانچ پڑتال، تربیت، کارکردگی کا انتظامی جائزہ، ہنگامی صورتحال میں ردعمل، ماحولیاتی بقاء و پائیداری کے طریقہء کار پر عمل، ٹھیکیداروں کی سرگرمیوں اور پیداواری عمل میں تحفظ بلکہ دیگر امور کے لئے بھی ایک جامع نظام کار فراہم کیا جاسکے
- طے شدہ اہداف اور کلیدی امور کے ذریعے QHSE کارکردگی کو پرکھا جائے گا اور تمام اندرونی و بیرونی متعلقہ شراکت داروں/اداروں کے ساتھ شفاف رابطہ رکھا جائے گا

تمام ملازمین اور ٹھیکیداران کام کے تمام شعبوں میں QHSE کے نافذ العمل قوانین سے بڑھ کر اقدامات کرنے کے پابند ہوں گے تاکہ QHSE کے معیار کو نہ صرف برقرار رکھا جاسکے بلکہ اس میں مسلسل بہتری لائی جاسکے جس کے ذریعے صارفین اور شراکت داروں میں کمپنی کی قدر کو بڑھایا جاسکے۔

سید وامق بخاری
مینیجنگ ڈائیریکٹر و چیف ایگزیکیٹو آفیسر

اگست 2015

Rev: 01

Annexure – V:
Environmental Monitoring Checklist

Table A 1: Environmental Monitoring Checklist for Vehicles			
No.	**Description**	**Status**	**Comments**
1	Are the vehicles maintained and inspected regularly?	Yes/ No	
2	Are the oil, fuel and other leaks from the vehicles immediately attended to?	Yes/ No	
3	Are the vehicles with leaks being operated?	Yes/ No	
4	Has there been any spillage during vehicle re-fueling or maintenance?	Yes/ No	
5	If yes, have recommended mitigation measures been adhered to?	Yes/ No	
6	Are the vehicles being washed or serviced in the field?	Yes/ No	
7	Are the vehicles being washed in designated areas having concrete pad and waste water collection pits?	Yes/ No	
8	Is vehicle related waste, such as oils, filters, old tires or parts are left lying around?	Yes/ No	
9	Is vehicle related waste, such as oils, filters, old tires or parts being disposed of properly?	Yes/ No	
10	Are the vehicles emitting excessive smoke?	Yes/ No	
11	Do the potentially noisy vehicles have properly functioning silencers (mufflers)?	Yes/ No	
12	Do all vehicles have provision for containers/trash bags to store trash/refuse?	Yes/ No	
13	Are PPL's HSE guidelines being followed?	Yes/ No	
14	Have all other mitigations measures specified in the IEE been adhered to?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 2: Environmental Monitoring Checklist for Camp Siting			
No.	**Description**	**Status**	**Comments**
1	Have photographs been taken to record the pre-camping conditions?	Yes/ No	
2	Has the camp site been selected on existing vacant and leveled land?	Yes/ No	
3	Has the camp site been selected at least 500 meters away from any communities?	Yes/ No	
4	Have compensation amounts been settled based on prevailing market rates?	Yes/ No	
5	Has any vegetation been cleared?	Yes/ No	
6	If yes, is the vegetation loss significant?	Yes/ No	
7	If yes, have the mitigation measures specified in the IEE been adhered with?	Yes/ No	
8	Have the trees or bushes been used as fuel wood?	Yes/ No	
9	Have any trees been cut?	Yes/ No	
10	Does the campsite have a septic system comprising of septic tank and soak pit?	Yes/ No	
11	Have the soak pits for laundry, kitchen and showers been built?	Yes/ No	
12	Have the soak pits been built in absorbent soil?	Yes/ No	
13	Have the soak pits (where required) been built down-slope from the camp?	Yes/ No	
14	Have the soak pits been designed to accommodate waste water generated during the total duration of the operation?	Yes/ No	
15	Are the soak pits within 300 meters of any surface water source or a ground well?	Yes/ No	
16	Has plastic sheeting been placed under all concrete?	Yes/ No	
17	Have all other mitigations measure specified in the IEE been adhered to?	Yes/ No	
18	Are PPL's HSE guidelines being followed?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 3: Environmental Monitoring Checklist for Camp Operation			
No.	**Description**	**Status**	**Comments**
1	Has any vegetation been removed or damaged?	Yes/ No	
2	Are bushes or trees being used as fuel wood?	Yes/ No	
3	Is water drawn from a local water source?	Yes/ No	
4	If yes to point 3, has the yield and demand been determined to ensure there is enough to meet the requirements of locals?	Yes/ No	
5	If yes to point 3, is water well discharge(s) being checked and recorded on a regular basis?	Yes/ No	
6	If yes to point 3, is compensation being paid for the water use?	Yes/ No	
7	Has the natural drainage been disturbed?	Yes/ No	
8	Are the fuels and oils handled in a safe manner, ensuring no leakage or spillage?	Yes/ No	
9	Are the soak pits being constructed 300 meters away from a surface water source or ground water well?	Yes/ No	
10	Has any surface water entered the soak pits?	Yes/ No	
11	In case the soak pits gets filled during the operation, has the grey water been sprinkled?	Yes/ No	
12	Is sprinkling of grey water being done in a manner to avoid water ponding?	Yes/ No	
13	Has arrangements for the transportation of black water to the municipal drains put in place?	Yes/ No	
14	Are there enough waste bins around the camp?	Yes/ No	
15	Are the waste bins emptied on a regular basis?	Yes/ No	
16	Is food waste disposed in the open?	Yes/ No	
17	Is the combustible waste regularly disposed of?	Yes/ No	
18	Is the non-combustible waste being sent to the approved waste contractor(s)?	Yes/ No	
19	Is medical waste being stored separately at the campsite?	Yes/ No	
20	Is medical waste being disposed of properly i.e., incinerated?	Yes/ No	
21	Are water consumption figures being maintained?	Yes/ No	
22	Are PPL's HSE guidelines being followed?	Yes/ No	
23	Have requirements of the IEE been adhered to?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 4: Environmental Monitoring Checklist for Road Travel			
No.	**Description**	**Status**	**Comments**
1	Is the number of routes kept to a minimum?	Yes/ No	
2	Have photographs been taken to record pre-usage conditions?	Yes/ No	
4	Have new access routes been developed?	Yes/ No	
5	If yes, have requirements of the IEE been adhered to?	Yes/ No	
6	Are short cuts been used?	Yes/ No	
7	Has vegetation clearing been minimized?	Yes/ No	
8	Has off road travel been observed?	Yes/ No	
9	Is vehicle speed limit of 40 km/h being followed?	Yes/ No	
10	Are heavily traveled routes watered (where required) on a daily basis to minimize dust?	Yes/ No	
11	Are the drivers careful and watchful about wild and domestic animals?	Yes/ No	
12	Has any natural drainage been disturbed or altered?	Yes/ No	
13	Is any soil erosion observed?	Yes/ No	
14	If yes, have the mitigation measures been adhered to?	Yes/ No	
15	Is night travel observed?	Yes/ No	
16	Is the use of horns avoided as far as possible?	Yes/ No	
17	Are pressure horns being used?	Yes/ No	
18	Are PPL's HSE guidelines being followed?	Yes/ No	
19	Do the vehicles carry adequate containers/trash bags for litter/garbage and are they emptied at the campsite or other designated location regularly?	Yes/ No	
20	Are there any damages caused by project activities to local roads or other infrastructure (where applicable)?	Yes/ No	
21	If yes, are these damages being repaired?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 5: Environmental Monitoring Checklist for Restoration & Rehabilitation			
No.	**Description**	**Status**	**Comments**
1	Have the camping sites been restored as close as possible to the original condition?	Yes/ No	
2	Have the campsites been cleaned, leaving no refuse or wastes behind?	Yes/ No	
3	Have the routes been restored as close as possible to the original condition?	Yes/ No	
4	Have the well locations pits restored as close as possible to the original condition?	Yes/ No	
5	Have all flags, stakes, signs and refuse been removed?	Yes/ No	
6	Have all holes and mud pits made for the purpose been backfilled and restored?	Yes/ No	
7	Have the photographs of the above mentioned activities been taken to compare with the pre-project conditions?	Yes/ No	
8	Have all damages caused to local infrastructure during the operation been repaired and restored?	Yes/ No	
9	Have the erosion control measures been taken where needed?	Yes/ No	
10	Has it been ensured that the project activities do not become new routes?	Yes/ No	
11	Have the concrete blocks from the explosive storage area been removed?	Yes/ No	
12	Have all the ditches, soak pits and septic tanks been backfilled with an extra cap of 1 meter soil on top to cater compaction?	Yes/ No	
13	Has the contaminated soil been removed and disposed of appropriately?	Yes/ No	
14	Have the sites been inspected to ensure the recommended restoration measures have been strictly adhered to?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 6: Environmental Monitoring Checklist for Fuels, Oils & Chemicals			
No.	**Description**	**Status**	**Comments**
1	Do the fuel storage facilities have adequate secondary containment up to 120% capacity in case of leakage or spillage?	Yes/ No	
2	Is there any other combustible or flammable material in the fuel storage area?	Yes/ No	
3	Is regular inspection carried out to check leaks and spills?	Yes/ No	
4	Have the entire oil and fuel storage areas concrete floor underneath to prevent soil contamination from leaks or spills?	Yes/ No	
5	Are the fuel tanks properly marked with their contents?	Yes/ No	
6	Are the fuel transfer arrangements protected against spills?	Yes/ No	
7	Are the drip trays being used?	Yes/ No	
8	Are tarpaulin sheets placed under equipment and fuel containers that have the potential to spill or drip fuels, oils or chemicals?	Yes/ No	
9	Is the fuel transfer operation being supervised?	Yes/ No	
10	Are the spills and leaks thoroughly cleaned?	Yes/ No	
11	Are the spilled oil or fuel and used clean-up material being disposed properly?	Yes/ No	
12	Are the spills and leaks reported and recorded?	Yes/ No	
13	Is contaminated soil being removed or covered following proper clean-up procedures?	Yes/ No	
14	Is the emergency response plane available on site?	Yes/ No	
15	Is the PPL's emergency response plan being followed in case of spills and leaks (moderate or major spills and leaks)?	Yes/ No	
16	Has all the mitigation measures suggested in the IEE been adhered to?	Yes/ No	
17	Are PPL's HSE guidelines being followed?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Table A 7: General Environmental Checklist			
No.	**Description**	**Status**	**Comments**
1	Are activities taking place in agricultural or grazing areas?	Yes/ No	
2	If yes, have compensation amounts being settled?	Yes/ No	
3	Are permitting staff informing village leaders of location and timing of all major activities?	Yes/ No	
4	Is a community complaints register being managed and maintained?	Yes/ No	
5	Are there any damages caused by project activities to local roads or other infrastructure (where applicable)?	Yes/ No	
6	If yes, are these damages being repaired?	Yes/ No	
7	Are the cultural norms being respected by the project staff?	Yes/ No	
8	Has off sets been provided from sites of religious, cultural or archaeological significance? (If found)	Yes/ No	
9	Is trash, wrappers, shopping bags, paper, cans, bottles or any other kind of litter being left out in the open?	Yes/ No	
10	Is the “no hunting, no harassment, no fishing and no trapping” policy strictly enforced?	Yes/ No	
11	Are any Archaeological sites or places of cultural or religious significance disturbed?	Yes/ No	
12	Is the “no shortcuts” policy followed?	Yes/ No	
13	Are PPL’s HSE guidelines being followed?	Yes/ No	
14	Has all the mitigation measures suggested in the IEE been adhered to?	Yes/ No	

Name: _____ Signature: _____ Date: _____

Additional Comments

Annexure – VI:
Test Reports

Quality TESTING SERVICES

EPA Certified Lab
EPA/LAB/Certificate/QTS-11/2013

BUREAU VERITAS Certification

QMS/III/018 WA	
Revision : 02	Date 10.09.2013

Lab Report Ref. No. : QTS/EMC/PPL/18/1021-A

Reporting Date: 23/02/2018

Report to: EMC (IEE of PPL Kalat –Margand Block Baluchistan)

SAMPLE DESCRIPTION

Sample ID: Water Sample
Sample Type: Grab Sample
Sample Collected/Submitted by: EMC Representative
Sampling Date: 11/02/2018
Sample Receipt at QTS - Date : 11/02/2018

ANALYTICAL TEST REPORT

S. #.	PARAMETERS	STANDARDS	UNITS	RESULTS			TEST METHOD
		BSDWQ LIMITS		Spring Water-04	Spring Water-05	Village Water-06	
1	pH value	6.5 – 8.5	SU	7.82	7.61	7.93	USEPA 150.1
2	Odour	Non Objectionable / Acceptable	Physical	Acceptable	Acceptable	Acceptable	Physical
3	Color	≤ 15	TCU	0.61	0.63	0.60	APHA-2020 B/C
4	Turbidity	< 5	NTU	1.1	0.9	1.3	APHA-2130 B
5	Total Dissolved Solids(TDS)	< 1000	mg/L	161	158	163	Hach 8160
6	Total Hardness as $CaCO_3$	< 500	mg/L	90.3	86.1	89.4	EDTA Titration.Hach-8213
7	Fluoride(as F^-)	≤ 1.5	mg/L	0.62	0.58	0.61	USEPA 340.1
8	Chloride(as Cl^-)	< 250	mg/L	40.2	38.1	41.1	Hach 8206
9	Nitrate (NO_3)	≤ 50	mg/L	2.40	1.97	2.41	Hach -8039
10	Nitrite (NO_2)	≤ 3	mg/L	0.007	0.005	0.007	Hach - 8153
11	Cyanide(as CN-)total	≤ 0.05	mg/L	BDL	BDL	BDL	Hach 8027
12	Phenolic Compound as (Phenols)	-	mg/L	BDL	BDL	BDL	USEPA-420.1
13	Arsenic	≤ 0.05	mg/L	BDL	BDL	BDL	APHA-3120 B
14	Zinc	5.0	mg/L	0.12	0.8	0.16	USEPA 3500 Zn B
15	Manganese	≤ 0.5	mg/L	BDL	BDL	BDL	Hach 8034
16	Barium	0.7	mg/L	BDL	BDL	BDL	Hach 8014
17	Sulphate (SO_4^{-2})	600	mg/L	26	25	26	USEPA-375.4

BSDWQ = Bolchistan Standards for Drinking Water Quality
USEPA = United States Environmental Protection Agency Method
Hach USA, method
BDL= Below Detection Limit
ND= Not Detected

- This report is not valid for any negotiations
- Report is valid for current batch(sample)
- The remaining portion of the sample will be discarded after 07 days unless otherwise instructed

Comments:
These parameters are within the BSDWQ limit.

Sample Analyzed by: Saira Tariq	**Signature of Laboratory In charge:** **Name :** Sumbla Ahmed

Quality Testing Services Karachi Q.T.S

Office No.505, Anum Estate Building, Opposite Duty Free Shop, Main Shahrah-e-Faisal, Karachi.
Tel. No. 92-21-34311466, 92-21-34382860, 92-21-34321532, Fax. No. 92-21-34311467

Email: info@qts.com.pk

Quality TESTING SERVICES

EPA Certified Lab
EPA/LAB/Certificate/QTS-11/2013

BUREAU VERITAS Certification

QMS/III/018 WA	
Revision : 02	Date 10.09.2013

Lab Report Ref. No. : QTS/EMC/PPL/18/1021-B

Reporting Date: 22/02/2018

Report to: EMC (EIA of PPL Kalat I-Margand Block Baluchistan)

SAMPLE DESCRIPTION

Sample ID: Water Sample
Sample Type: Grab Sample
Sample Collected/Submitted by: EMC Representative
Sampling Date: 15/02/2018
Sample Receipt at QTS - Date : 15/02/2018

ANALYTICAL TEST REPORT

S. #.	PARAMETERS	STANDARDS	UNITS	RESULTS			TEST METHOD
		BDWQ LIMITS		Ground Water (Bore Well-01)	Ground Water (Bore Well-01)	Ground Water (Bore Well-01)	
1	pH value	6.5 – 8.5	SU	7.80	7.96	8.03	USEPA 150.1
2	Odour	Non Objectionable / Acceptable	Physical	Acceptable	Acceptable	Acceptable	Physical
3	Color	≤ 15	TCU	0.8	0.67	0.74	APHA-2020 B/C
4	Turbidity	< 5	NTU	1.0	1.0	1.0	APHA-2130 B
5	Total Dissolved Solids(TDS)	< 1000	mg/L	164	162	171	Hach 8160
6	Total Hardness as $CaCO_3$	< 500	mg/L	91.2	89.4	95.2	EDTA Titration.Hach-8213
7	Fluoride(as F^-)	≤ 1.5	mg/L	0.63	0.69	0.75	USEPA 340.1
8	Chloride(as Cl^-)	< 250	mg/L	42.2	49.7	53.3	Hach 8206
9	Nitrate (NO_3)	≤ 50	mg/L	2.46	1.97	2.41	Hach -8039
10	Nitrite (NO_2)	≤ 3	mg/L	0.007	0.005	0.007	Hach - 8153
11	Cyanide(as CN-)total	≤ 0.05	mg/L	BDL	BDL	BDL	Hach 8027
12	Phenolic Compound as (Phenols)	-	mg/L	BDL	BDL	BDL	USEPA-420.1
13	Arsenic	≤ 0.05	mg/L	BDL	BDL	BDL	APHA-3120 B
14	Zinc	5.0	mg/L	0.16	0.10	0.08	USEPA 3500 Zn B
15	Manganese	≤ 0.5	mg/L	BDL	BDL	BDL	Hach 8034
16	Barium	0.7	mg/L	BDL	BDL	BDL	Hach 8014
17	Sulphate (SO_4^{-2})	600	mg/L	28	27	32	USEPA-375.4

BSDWQ = Baluchistan Standards for Drinking Water Quality
USEPA = United States Environmental Protection Agency Method
Hach USA, method
BDL= Below Detection Limit
ND= Not Detected

- This report is not valid for any negotiations
- Report is valid for current batch(sample)
- The remaining portion of the sample will be discarded after 07 days unless otherwise instructed

Comments:
These parameters are within the BSDWQ limit.

Sample Analyzed by: Saira Tariq	**Signature of Laboratory In charge:** **Name :** Sumbla Ahmed

Quality Testing Services Karachi Q.T.S

Office No.505, Anum Estate Building, Opposite Duty Free Shop, Main Shahrah-e-Faisal, Karachi.
Tel. No. 92-21-34311466, 92-21-34382860, 92-21-34321532, Fax. No. 92-21-34311467

Email: info@qts.com.pk

Annexure – VII:
PPL SOPs for Prevention and Control of COVID-19 at worksites

Preventive Measures & Management of COVID-19 Case at PPL Offices

May 2020

INTRODUCTION

Uninterrupted operation of Oil and Gas operations across Pakistan is considered essential even in the war time and PPL is committed to continue its operations during this challenging period of COVID-19 outbreak.

This protocol identifies preventive measures to be adopted at PPL offices in line with international and national guidelines and consolidates all previously issued advisories on COVID-19 preventive measures with the aim to minimize the risk of local transmission in its office operations.

This protocol also sets out the procedure to be followed if, despite implementing all possible controls, there is a confirmed COVID-19 infection at PPL offices.

Note:

- Suspected COVID-19 cases shall be handled as per international guidelines and company doctor's assessment. This protocol applies to confirmed COVID-19 cases only.
- This protocol is also applicable on PPL Karachi Based Store and Superhighway Store.
- The preventive measures detailed in this document shall remain applicable till further notice.
- The preventive measures set in this document may be amended based on the developing situation on ground.

PART A: PREVENTIVE MEASURES TO REDUCE RISK OF LOCAL TRANSMISSION

Identification of Staff for Duty Resumption

1. Line Managers shall identify staff who may "Work from Home" during the COVID-19 situation based on:
   a. Staff falling under high-risk (suffering from chronic illness, age above 55 years, cough & flu or fever) shall work from home. SMMS may be consulted for identification of high-risk staff.
   b. Staff aged over 55 years at Head office shall work from home (in compliance to SOP issued by Sindh Govt. for workplaces)
   c. Staff who has the facility and capability of working from home, using IT support services
2. Staff "Working from Home" (not falling under high-risk category) may be called office intermittently to perform an essential task for which physical presence is required.
3. Line Managers shall also evaluate the available space in the department hall with respect to social distancing guidelines and reducing congestion.
4. Each employee / contractor staff who is required to join office after 'Work from Home' period shall submit "Self-Assessment Questionnaire" before resuming office duty to his/her Immediate Supervisor / Line Manager (Annexure A) as one-time exercise after issuance of this protocol and rejoining office.
5. All employees / contract staff who have symptoms (i.e., fever, cough, or shortness of breath) must stay home. Such staff must seek prior medical advice by company doctor via phone / MS Teams before coming office.

6. Line Managers are required to develop an attendance plan for their staff based on the above and make their staff aware of the requirements set in this document. Attendance of the staff working from home shall be approved by line manager only when a duly filled log sheet is attached with the attendance of staff for each day.

Precautionary Measures at Office Entrances

7. Security Guards at the office entrance shall measure temperature of all persons entering PPL premises using infrared thermometer and shall provide plain Surgical Masks to all persons entering the premises (one per day).
8. Any employee / contractor / visitors with fever (temp $\geq$ 37 ^{o}C) or apparent symptoms of flu / cough shall be courteously denied entry by the Security Supervisor and advised to contact concerned PPL Officer / Medical Services Staff through phone for any further assistance.
9. All PPL staff shall mark attendance through biometric machines using their Employee Card.
10. Security Supervisors at PPL Offices shall maintain the daily attendance record of all contract staff, contractors (janitorial, maintenance, IT support staff etc.) and visitors who are entering and leaving PPL premises and all those who are not able to mark their attendance through biometric machines.

Maintaining Respiratory Hygiene

11. All persons entering the premises shall be encouraged to sanitize their hands before moving into the premises or wash their hands before moving to their workstations and frequent hand washing during entire stay (with soap and water thoroughly for at least 20 seconds and using tissue to turn off the faucet) or sanitize time to time.
12. All persons entering PPL premises shall be required to wear mask while entering the premises until they reach their workstation, also while accessing common areas. Staff shall be encouraged to wear mask even at their workstation.
13. All persons must follow general hygiene tips, such as coughing/ sneezing into tissue paper (then dispose used tissue paper properly in a dustbin) or in elbow instead of openly in air. Followed by washing / sanitizing hands.
14. Ventilation shall be promoted in the offices by opening doors / windows during occupancy.

Social Distancing Practices

15. Staff's whose workstation is close to other staff (< 6 ft) should be preferable relocated to other vacant workstations or shall be mandatorily required to use mask even on the workstation.
16. All persons entering PPL premises shall exercise social distancing practices as follows:
    - All persons shall maintain at least 6 ft distance during the conversations or 3 ft in a queue.
    - Handshakes shall not be practiced.
    - Elevators shall be used only for medical reasons and only one person along with the lift operator shall travel at a time.
    - Meetings and discussions shall be conducted through telephone and MS Teams.
    - Only under unavoidable circumstances meetings may be held in Conference Rooms while maintaining at least 6 ft (in all directions) between the meeting participants.
    - Place markers on floor, indicating safe distancing at the reception / entrance.
    - Prayer area shall have no mats / rugs and only limited persons pray at a time ensuring 3 ft (at least) spacing with floor markings and the floor is wiped clean and disinfected before and after each prayer.

Surface Disinfection

17. Janitorial staff shall remain on their designated floors / spaces and shall avoid unnecessary movements.
18. Janitorial staff in addition to routine cleaning shall carry out disinfection of frequently touched surfaces i.e. workstations, printers, handrails, doorknobs etc. Janitorial staff shall use masks, gloves while carrying out disinfection. It is also recommended for Janitorial staff to wear face shield / splash goggles while carrying out disinfection to prevent accidental facial contact of their hands during disinfection.
19. Employees / Contract Staff shall be encouraged to clean / disinfect their workstations frequently (e.g. keyboard, mouse, telephone etc.) through alcohol wipes.
20. Common household disinfectants can be effective for surface disinfection such as diluted bleach (sodium hypochlorite) or hydrogen peroxide and alcohol solutions with at least 70% alcohol content. However, while disinfecting considerations must be given to proper ventilation during and after application, manufacturer's instructions for concentration must be followed or bleach solution can be prepared by mixing 4 to 5 tablespoons (1/3 cup) bleach per liter of water, contact time (at least 1 minute) and use of appropriate PPEs such as hand gloves, masks etc.
21. Hard / non-porous surfaces requiring disinfection shall be cleaned using detergent or soap and water prior to applying disinfectants. For soft / porous surface, remove visible contamination before applying disinfectant.
22. For electronics such as printers, remote controls, screens, telephone sets etc. remove visible contamination if present. Use alcohol-based wipes or sprays containing at least 70% alcohol to disinfect.

Food Consumption

23. All employees / contract staff shall carry their lunch from their homes and all dining areas shall remain closed.
24. Tea shall not be served by Tiffin / Canteen staff. If required, staff shall prepare tea for himself using electric kettle. Disposable cups shall be used for drinking tea.
25. Disposable drinking glasses or staff's designated glass would be used for drinking water. Visitors shall also use disposable glasses.

Visitor's Management

26. Couriers and newspapers etc. shall be delivered at the entrance or to the designated Dispatch Section. Delivery staff shall not be allowed to move on any floor.
27. Visitors movement to PPL offices is to be minimized to extremely essential visits. Hence, meetings are to be conducted remotely using IT Services.
28. Recreational Areas such as PPL club shall remain closed for all employees.
29. If physical presence of the visitor is vital at the meeting, the host employee / contract staff shall acquire concurrence of respective Line Manager and inform Security Reception in advance. Meetings with the visitors shall be preferably carried out in the vacant recreational areas and their movement inside PPL office shall be restricted to the designated areas only. Ensuring compliance with all COVID-19 precautions, the room utilized for meeting a visitor shall be disinfected frequently.
30. Visitors must display the visitor's card all the time during their visit at PPL office as provided by PPL reception and shall be briefed by host employee / contract staff on the COVID-19 measures to be followed during their visit to PPL offices.

Journey Management

31. One passenger per vehicle shall only travel with the driver during official movement in which company vehicle is utilized. In view of social distancing advisory by WHO, passenger and driver shall be seated diagonally. Whereas, masks shall be used by the driver and the passenger during the journey.
32. Vehicles arranged for the trip, shall be properly disinfected with a surface disinfectant (preferably isopropyl alcohol or sodium hypochlorite / diluted household bleach) before embarking on each journey. Also, hand sanitizers and tissue box shall be maintained in the vehicles.
33. Use of vehicle's Air Conditioner during the journey to be discouraged to promote cross ventilation in the vehicle to the extent possible.
34. Drivers of hired vehicles shall also be assessed against self-assessment questionnaire (Annexure A) by the PPL's Transport Desk staff with the assistance of Medical Services Dept.

Incoming Goods / Materials

35. Material / Courier / Packages delivered at PPL Offices shall be received by designated staff only and such staff must wash / sanitizing their hands after each handling. Staff may also use other recommended PPEs (Gloves, Head Gear, Masks) for material handling however, washing / sanitizing hand is the primary control measure to be complied before and after each material handling activity.
36. If item received is to be immediately moved further, then the article must be disinfected by spraying disinfectant solution or applying alcohol wipes by the receiving PPL staff to the extent possible.
37. If the material / package onward dispatch is not required immediately then the same can be kept under isolation at a designated and properly ventilated retaining room / area for minimum a day if packaging is in cardboard, up to three days for plastic and stainless-steel surfaces and up to four hours for copper surfaces.
38. If goods transporting vehicle is necessitated to enter the office premises, temperature and symptoms of COVID-19 must be monitored for driver, loaders and other associated staff at the entry points, if any symptom appeared such person(s) shall be restricted to enter the premises.
39. Goods transportation person(s) allowed entry for delivery only up to designated delivery area must sanitize their hands and must wear masks and disposable gloves for whole duration while in PPL premises.
40. Each PPL Office is required to develop material receiving SOP in line with the above requirements.

PART B: PROTOCOL FOR MANAGING CONFIRMED CASE OF COVID-19

When an employee / contract staff informs company doctor that he has been tested COVID-19 positive, following actions will be taken:

A. Immediate Actions by Company's Doctor

1. Get information from staff i.e. full contact details, address, contact #, department, location and line manager
2. Ask staff to prepare the following information:
   a) Visit(s) to PPL office during the 14 days prior to onset of symptoms
   b) Date of last visit to PPL office
   c) List of persons, the patient might have come in contact during office
   d) List of contacts at home
3. Remind staff to inform GOP designated COVID-19 helpline i.e. 1166 and follow the advice of testing facility.

B. Activation of Incident Management Team (IMT) and flow of information

1. Company's doctor shall inform DMD AO (IMT Chairman), GMHR, SM QHSE and concerned Line Manager on the case.
2. DMD AO shall lead the overall management of COVID-19 positive case through IMT. Following actions shall be taken (as minimum) as per It's advisory:
   a) Administration Head shall arrange isolation and disinfection of the affected office locations as required in consultation with SM QHSE
   b) GMHR shall manage all internal communications to employees and line managers. GMHR may issue advisory for employees for "Working at Home" during the disinfection process (as needed) in coordination with respective Administration Head. Respective Line Manager's shall further issue advisory to their respective third-party contract staff working at PPL offices.
   c) All external communication to Govt. Authorities, Ministry of Energy and Media etc. on positive COVID-19 case shall be carried out by GMCS with the support of SMMS and SM QHSE.
   d) Company's doctor shall also inform GOP designated COVID-19 helpline i.e. 1166
   e) Concerned Line Manager with the support of HR / Security Dept. shall identify and trace individuals who may have been in close contact with positive case in PPL offices and shall remain in contact with SMMS for further guidance on contact testing. Assistance from daily attendance record shall also be sought for identification of contacts.
   f) Company's doctor shall maintain communication with the patient at least twice a day.

C. Duty Resumption

Company's Doctor shall decide for resumption of the COVID-19 recovered patient and his / her contacts after fitness assessment.

Annexure A

Self-Assessment Questionnaire for PPL Employees / Contractor Staff before resuming Office Duty

Name:	
Employee No.:	(to be filled by PPL employee)
Contractor's Name:	(to be filled by Contractor staff)
Posted Location:	
Contact #:	
Date:	

S. #	Question	Answer (Yes / No)
1.	Is your age above 55 years?	
2.	Have you, in the last two weeks, been in close contact with a person who has COVID-19?	
3.	Have you, in the last two weeks, been in a country / region with a high number of cases of COVID-19?	
4.	Do you have a fever (temp > 37 C)?	
5.	Have you used medications such as paracetamol or aspirin to suppress fever in the last 24 hours?	
6.	Are you coughing (even mildly)?	
7.	Are you currently experience shortness of breath?	
8.	Do you have any other chronic illness?	

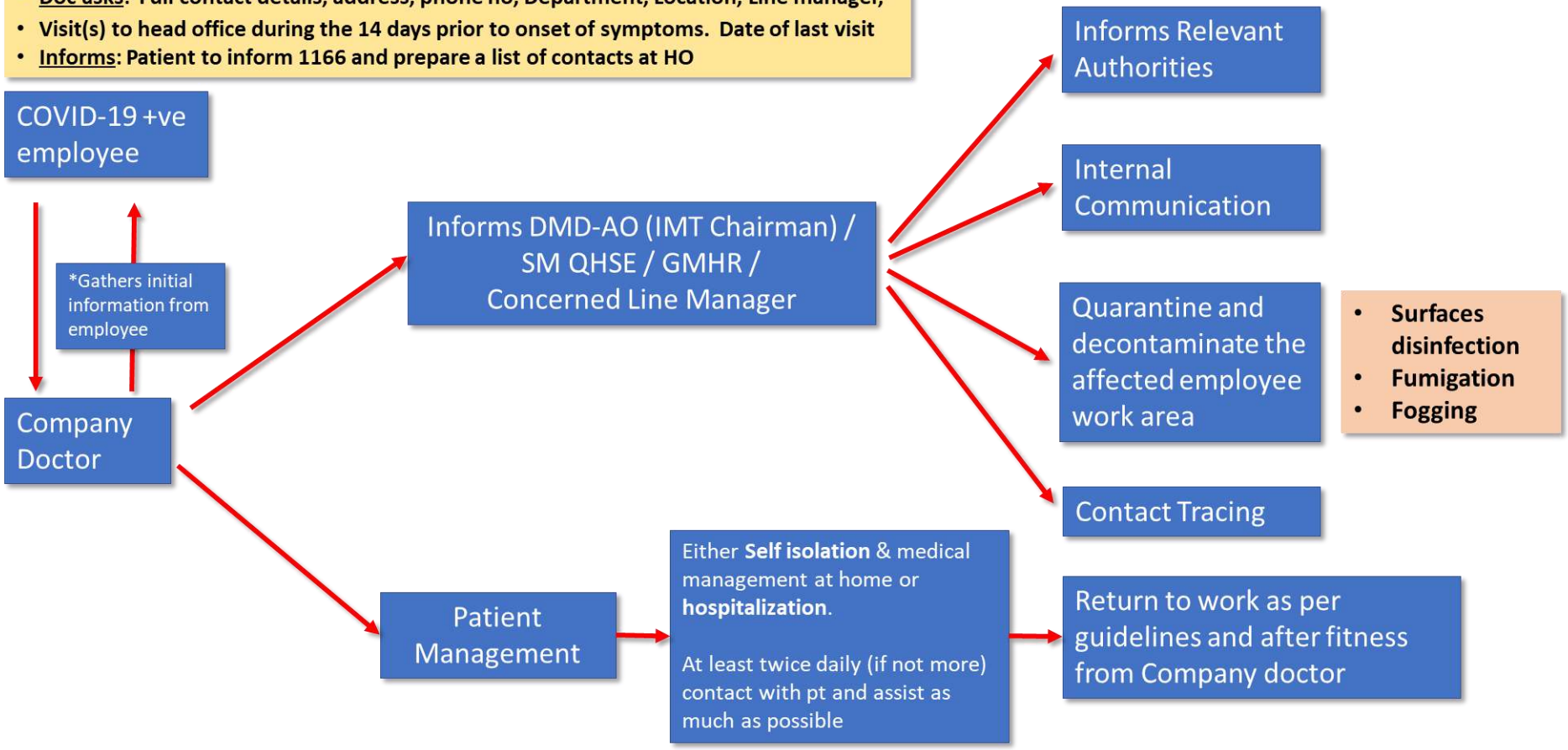
Note:

- If answers to all above questions are "No" then only the employee or contractor staff may be called to resume office duty.
- Incase answer to any of the above question comes out as "Yes" then, the Line Manager / Immediate Supervisor shall advise employee to contact company's doctor for further guidance.
- If answer to any above question turns out "Yes" after submitting the self-assessment questionnaire (e.g. after 2-3 days). Employee shall immediately inform his / her line manager and company's doctor and Contractor staff shall inform his/her respective supervisor.
- If the Employees / Contract Staff is unable to fill / submit the questionnaire, Line Manager / Immediate Supervisor needs to assess staff / contractor being called for duty through phone call.

Annexure B

Algorithm for COVID-19 Positive Individual at Head Office

- **Doc asks: Full contact details, address, phone no, Department, Location, Line manager,**
- **Visit(s) to head office during the 14 days prior to onset of symptoms. Date of last visit**
- **Informs: Patient to inform 1166 and prepare a list of contacts at HO**



Revision: 01

Issue Date: May 14, 2020

PROTOCOL FOR FIELD STAFF ROTA CHANGEOVER

Activity	Name	Designation	Signature
Prepared by	Masood Sarwar	SM QHSE	
	Zakir Sadiq Alavi	SMMS	Digitally signed by Zakir Sadiq Alavi Date: 2020.05.15 18:36:37 +05'00'
Recommended by	M. Afzal Siddiqi	GM HR	
	Farooq Azam Shah	Actg. GM (Sui & Kdt)	
	Dr. Shujjat Ahmed	Actg. GM (G/H/M)	Digitally signed by A_Shujjat Date: 2020.05.16 11:30:12 +05'00'
	Abid Ashfaque Malick	GM (ADS & PO)	
Approved by	Khalid Raza	DMD AO	

INTRODUCTION:

In the wake of outbreak of Coronavirus disease COVID-2019, PPL's prime national responsibility is to ensure un-interrupted supply of hydrocarbons to the country, while also ensuring health, safety and wellbeing of our staff and their families.

The purpose of this protocol is to facilitate field staff changeover (MPT & N-MPT) while exercising strict precautions as per recommended guidelines and limiting spread of COVID-2019 at PPL sites for sustained operations.

This protocol shall also be followed for all site movements including third-party staff engaged by PPL. This protocol replaces Field Staff Changeover Protocol (original version; issued on 09th April 2020) while it doesn't supersede / replace any PPL Advisories related to precautionary measures for COVID-19 issued previously.

Fields / Locations may develop guidelines over and above this protocol to suit their local environment and administrative issues. Department / Field / Location Incharges are required to make the staff under their domain aware of the requirement of this protocol and ensure compliance during all movements.

***Note**: Even after resumption of domestic / chartered flights, this protocol shall remain applicable for all road travel required to and from field locations till the COVID-19 outbreak situation improves in the country and this protocol is formally revoked by the company's management. Additional requirements (if any) for air travel would be issued separately.*

GENERAL:

- The MPT staff will follow extended days 36 days rotation cycle which may stretch up to 42 days or beyond as per the logistic convenience.
- Female workers (excluding Sui Hospital staff) shall not be moved to Fields for performing duty and shall continue to work from home.
- Field / Site Incharges shall develop list of essential staff required for smooth operations and non-essential staff without which the operations can be sustained.
- Each staff identified in the list of essential staff shall undergo medical screening by respective Field Doctor as elaborated in Step # 01.
- List of non-essential staff shall be approved by Asset Manager and submitted to HR Department for information. This approval shall be valid till this protocol remains applicable and the list can be modified by the Asset Manager on need basis.
- Non-essential staff after availing days off may be allowed to work from home if required. Such staff may be called on duty at any point as per the operational requirement.
- Non-essential staff shall not be entitled for day-offs during the period they have been required to work from home.

STEP # 01: SCREENING PRIOR TO DEPARTURE

- Field / Site Incharges shall provide list of essential staff proposed for changeover along with their contact nos. to Field Doctor for screening of each employee. This screening shall be carried out on MS Team / Telephone by Field Doctor in line with the **Annexure A**.
- For cases where, Field Doctor identifies that staff has any one or more of the risk factors (as per part b of **Annexure A**) or any high risk medical condition, he shall consult SMMS HO during the screening process and before taking decision for staff's movement.
- Field Doctor shall also assess each vehicle driver (whether arranged from Field / Head Office or any other Locations) against the criteria specified in **Annexure A.** Driver who has been declared fit by Field Doctor for the journey shall only be utilized.
- Field doctor shall issue Fitness Certificate for each employee / driver post assessment and shall compile results in an MS Excel sheet and share the same with SMMS HO & Field Incharge for their information.

STEP # 02: PRECAUTIONARY MEASURES BEFORE AND DURING THE JOURNEY

- Staff movement may be carried out through company arranged vehicles or staff personal vehicles. For both cases, journey management and COVID-19 related precautionary measures detailed below shall be equally applicable.
- Vehicles may embark on journey to / from field in groups as per the logistic convenience. All in place security protocols shall be complied during the movement.
- One passenger per vehicle shall only travel with the driver. In view of social distancing advisory by WHO, passenger and driver shall be seated diagonally. Staff utilizing personal vehicles shall travel alone throughout the journey.
- Staff utilizing company vehicle arrangement shall be picked and dropped to their residence only through company provided vehicle.
- Vehicle planned for the journey whether arranged from Head Office / Field or personal vehicle, shall be properly disinfected with a surface disinfectant (preferably sodium hypochlorite / diluted household bleach) before embarking on the journey. Records of disinfection shall be maintained.
- Masks shall be preferably used by the driver and the passenger during the journey. For this purpose, 04 masks (suitable type of available mask i.e. plain surgical mask, HM 101 dust mask, FFP1 mask) shall be placed in the vehicle. The purpose of using mask is to comply to limit infection spread from asymptomatic patients and comply with Govt. Advisories.
- Alcohol based sanitizer (250 ml at least with min 60% alcohol v/v) and tissue box shall be placed in each vehicle.
- Water bottles and snack items (chips / biscuits) shall be placed in the vehicle for consumption for every return trip. Driver / Staff shall be strictly advised not to consume any eatables from hotel / café during the journey.
- Staff shall be encouraged to carry homemade food / water while embarking on the journey from their residence.
- Stopovers during the journey shall be preferably made at Fuel Stations and the vehicle would be parked away from crowd.
- Use of vehicle's Air Conditioner (AC) during the journey with driver to be discouraged to promote cross ventilation in the vehicle to the extent possible. Fresh Air Intake Mode should be turned on, if the AC use is unavoidable.
- Journey Management Plan shall be developed for each journey; this plan shall be developed by Site Admin while assessing the risks involved, reviewed by QHSE site staff and approved by Field / Site Incharge. Adequate rest period for the driver shall be kept while developing JMPs (refer notes below for details). All journey starting from contractor's base location to pick up staff or from sites shall start early morning in the day light.
- Driver and the employee must keep his / her CNIC, Company's Card, Fitness Certificate issued by the Doctor, copy of Advisory from Ministry of Energy, Petroleum Division (**Annexure C**) and Journey Recommendation Letter from Site Incharge (This letter would mention that the staff travelling is essential for company to continue its Oil & Gas operations, the Name & CNICs of driver & staff and the vehicle registration number)

STEP # 03: ARRIVAL AT SITE

Upon arrival of vehicle at field:

- Luggage carried by the employee shall be sprayed by disinfected before transferring to the residential area.
- Vehicle shall be again properly disinfected with a surface disinfectant (preferably sodium hypochlorite / diluted household bleach).
- Supplies such as hand sanitizers, face masks, tissue box shall be replenished
- Employee and driver shall report to Field Doctor for follow up assessment as per **Annexure B**.
- Post follow up assessment, Field Doctor shall declare the employee / driver fit to resume duty or seek SMMS HO advice in other case.
- Post follow up assessment, a summary document shall be provided to reporting employee by QHSE site staff on measures implemented at site to combat Covid-19. This shall be followed by brief orientation of the employee in open air or through MS Teams.

EXCEPTIONAL CASES:

- For road travel from site to staff residence (or vice versa) requiring over 10 hrs, both, staff and the driver shall carryout night stay at any of PPL Fields / Operational Sites / PPL BME Khuzdar on the way.
- Arrangements shall be made at night stopover PPL sites / PPL BME Khuzdar where applicable; these shall include designating separate rooms for the staff and driver away from regular field staff. Food shall be served in respective rooms to staff carrying out stopover. Disinfection protocols shall be observed during the stay & post departure of stopover staff.

Note:

- *All Road Transport Safety requirements set forth in QHSE Procedure (PR 215) shall be adhered during the movement including but not limited to:*
  - *Maximum continuous driving time shall be 4.5 hours followed by 30 minutes break. However, it is strongly recommended to have 15 minutes break every two hours, or more frequent breaks during periods of circadian lows (i.e. when driver feels low level of alertness)*
  - *Max. 10 hours of driving within a rolling 24-hour period is permissible. This duration can be extended for 1-2 hours if the journey would end using this extension and there is sufficient day light available to complete the journey.*
  - *Night driving or driving during the darkness is not allowed. Permissible driving time starts 30 mins after sunrise and ends 30 mins before sunset.*
- *Due to unavoidable circumstances, Field / Site Incharges may acquire approval for exceptions required to this protocol from their respective Asset Manager's and SM QHSE after carefully assessing the risk involved.*
- *Transport arrangement shall be preferred through PPL Contractors stationed in Metropolitan Cities to maximize night stopover for the driver at the arriving PPL Field.*
- *All staff (not stationed in Karachi) shall reach Karachi and carryout night stopover (in Karachi) before onward movement to well sites located in Balochistan.*
- *In case of any clarity required on the above protocol, Field Incharges may contact SM QHSE / SMMS HO.*

References:

- *Getting your workplace ready for COVID-19 : WHO Guidelines dated 19th March [Link]*
- *Suspension of domestic flights extended till April 11: DAWN News [Link]*
- *Interim Guidance for Businesses & Employers to Plan and Respond to Coronavirus Disease 2019 [Link]*
- *People Who Are at Higher Risk for Severe Illness: CDC [Link]*
- *Preparing workplace for COVID-19: OSHA USA [Link]*
- *Cleaning and Disinfecting Your Facility: CDC USA [Link]*
- *Infectious disease outbreak management: IOGP [Link]*
- *GOP Preventive Guidelines for Industries and Workers against COVID19 [Link]*

Annexure A

03rd April 2020

Screening Procedure for Employees Personnel before Departure to Field Locations

1. Doctor's Responsibility

a. **Assess possible exposure:**

- Symptomatic patients (for our purpose all patients with fever and flu like symptoms should be considered potential COVID-19 patients),
- People with history of primary or secondary exposure
- People who have engaged in activities which are considered high risk (such as history of attending large gatherings e.g. funerals, congressional prayers, weddings or other functions).

b. **Assess Staff at risk**

I. Age >50 subject to fitness can be recommended for resumption of field duty

II. Staff with any of the following pre-condition should not be allowed for resumption of field duty
    - Uncontrolled diabetes
    - Chronic lung disease
    - Known heart disease
    - Immune suppressed for any other reason

Pre-departure Medical Assessment Certificate to field locations

Emp # _____, Emp. Name: _____

Field Location: _____

Hx of Primary or Secondary exposure: Yes ☐ No ☐

Hx of High Risk activities: Yes ☐ No ☐

Respiratory Complaints, suggestive of infection: Yes ☐ No ☐

If, YES to any above give details: _____

_____

_____

Personal Risk Assessment:

1. Age > 50 Yes ☐ No ☐
2. Uncontrolled Diabetes Yes ☐ No ☐
3. Chronic Lung Disease Yes ☐ No ☐
4. Heart Disease Yes ☐ No ☐

_____

Employee allowed to travel: YES ☐ NO* ☐

* If, NO, Review Date: _____

Signature: _____

Dr. Name: _____

Desig.: _____

Date: _____

Please keep a copy this certificate in record

Annexure B

Revised 30th March 20202

Screening Procedure for Employees / Contract Personnel Arriving at Field Locations

1. Employee & Supervisor Responsibility

   a. All employee will first report to field doctor for clearance (sample given below) before joining department.
   b. Doctor / Field Admin to maintain record of all employees screened.

2. Doctor's Responsibility

   a. **Assess possible exposure:**
      - Ask Employee about travel history (within last 14 days). If employee has travelled from an affected area, he should asked to stay in quarters until 14 days from date of arrival. He may be allowed leave quarters however he should wear a mask and maintain a distance of 3 feet from others and at mealtimes sits alone at the table. If, where possible, he may be asked to work from quarter.
      - Ask if he has engaged in at risk activities, such as history of attending large gatherings e.g. funerals, congressional prayers, weddings or other functions

   b. Employee has flu-like symptoms but has not been exposed or travelled from affected area, will be asked to stay on sick leave until recovered and not considered contagious (until >24 hr after fever/runny nose has subsided and/or improvement in cough. Generally this is 3 to 4 days)

   c. If employee had symptoms highly suggestive of COVID-19 but not tested, he may return to work when the following criteria are met:
      > at least 7 days have passed since symptoms first appeared and
      > at least 72 hours have passed since recovery of symptoms (defined as resolution of fever without the use of fever-reducing medications and improvement in respiratory symptoms (cough, shortness of breath))

   d. If an employee has flu-like symptoms and has been exposed to a patient suffering from COVID-19 or travelled from an affected area, he will be considered as suspected illness & SMMS (HO) should be intimated immediately. The suspected patient should be referred to facility with COVID-19 testing and isolation facility either in home city or as advised by SMMS (HO) and authorities be informed.

Medical / Clearance Certificate at field location

Emp # _____, Emp. Name: _____

Field Location: _____

Hx of Primary or Secondary exposure: Yes ☐ No ☐

Hx of High Risk activities: Yes ☐ No ☐

Respiratory Complaints, suggestive of infection: Yes ☐ No ☐

If, YES to any above give details: _____

_____

_____

Employee is allowed to join the field: YES ☐ NO* ☐

* If, NO, Review Date: _____

Signature: _____

Dr. Name: _____

Desig.: _____

Date: _____

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Annexure C

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No. CDN-3(1)/Mics/2020

Government of Pakistan
Directorate General (Petroleum Concessions)
Ministry of Energy, Petroleum Division
Islamabad
*****

To Whom It May Concern

Islamabad, the 24th March, 2020

Subject: **Uninterrupted Movement of Personnel and Equipment of Petroleum Exploration and Production Companies Operating in the Country During the Covid-19 Related Restriction**

Supply of Oil and gas and related operations are essential services to meet energy requirements of the country; hence movement of all exploration and production companies operating in the country, their subcontractors, personnel, equipment and vehicles is essential to keep the operation up and running.

2. It is, therefore, requested, in the best national interest to allow unhindered movement of oil & gas companies *inter alia* OGDCL, PPL, UEPL, PPL, ENI, MOL, MPCL, KUFPEC, POGC, OPL, OPPL and POL, including their subcontractors, personnel and vehicles, so that uninterrupted supply of vital energy requirements of the country may be ensured during crisis situation as a result of COVID-19 outbreak.

(**Tajdar Khattak**)
Deputy Director (Coord)
for Directorate General (Petroleum Concessions)

The Chief Secretaries
(1) Government of Sindh
(2) Government of Khyber Pakhtunkhwa
(3) Government of Balochistan
(4) Government of Punjab

Copy for Information:

Staff Officer to the Secretary (Petroleum Division), Islamabad

Management of Suspected COVID-19 Case at PPL Operated Sites

April 2020

INTRODUCTION

Uninterrupted operation of Oil and Gas site operations across Pakistan is considered essential even in the war time. PPL is committed to continue its site operations while corporate offices are in remote working mode, during the challenging period of COVID-19.

This protocol seeks to set out the procedure to be followed if, despite implementing all possible controls, there is a suspected coronavirus infection at a PPL operated site. Since these sites are generally located in remote areas of Pakistan across all provinces, a high-level process flowchart has been developed and agreed by all stakeholders (refer page # 3).

This protocol provides unified guidelines for safe and effective handling of suspected cases to ensure safety of other employees and surrounding communities and minimize the effect on business as far as reasonably practicable while continuing uninterrupted operations.

PROTOCOL FOR MANAGING SUSPECTED CASE OF COVID-19

1. Isolate the patient(s) as per GoP / WHO guidelines.
2. Medical staff / Driver shall wear proper PPE i.e. N-95 masks (or equivalent), disposable gown, eye protection, gloves while managing suspected cases(s).
3. Inform DMD AO and concerned Management (GM Asset, QHSE, Medical Services).
4. If minimal / mild symptoms, patient may be moved by ordinary car or site ambulance. No person other than the driver should escort the patient. In case of significant or marked symptoms doctor / medic should accompany patient. Medical staff shall preferably be seated in the driver compartment or if the condition of patient is not stable, then he may sit in back with complete PPE to reduce exposure. In situations where more than one person is suspected, logistics shall be arranged including stand-by ambulance(s).
5. Travel and vehicle requirements (as detailed in Field Staff Changeover protocol) shall be followed.
6. Decontaminate exposed workplaces, and camps once the suspect patient is moved out.
7. Patient will proceed as per doctors' advice for COVID-19 testing
8. Depending upon testing results, proceed as follows:

   Suspect patient COVID-19 results: Negative

   a. If the patient tests negative or if testing is denied (as happens when a patient does not fulfill the testing criteria at the facility), then the patient may return to site 48 hours after resolution of fever or intensity of cough (i.e. until after the contagious period for usual upper respiratory viral infections).
   b. In case the symptoms are highly suspicious of COVID-19 but test result is negative then patient should fulfill both following criteria before returning to site.
      - Until at least 72 hours after resolution of fever and reduction in intensity of cough
      - Until at least 7 days after onset of symptoms

   Company's doctor shall decide for return of the suspect patient to site duty based on the fitness assessment and above criteria.

Suspect patient COVID-19 results: Positive

a. Proceed with GOP guideline and as instructed by testing facility
b. Inform DMD AO and concerned Management (GM Asset, QHSE, Medical Services) who will inform relevant authorities. Site Management would liaison with local relevant authorities.
c. All contacts at site should be sent for testing and decontamination of location conducted (refer below for details)

CONTACT(S) TRACING

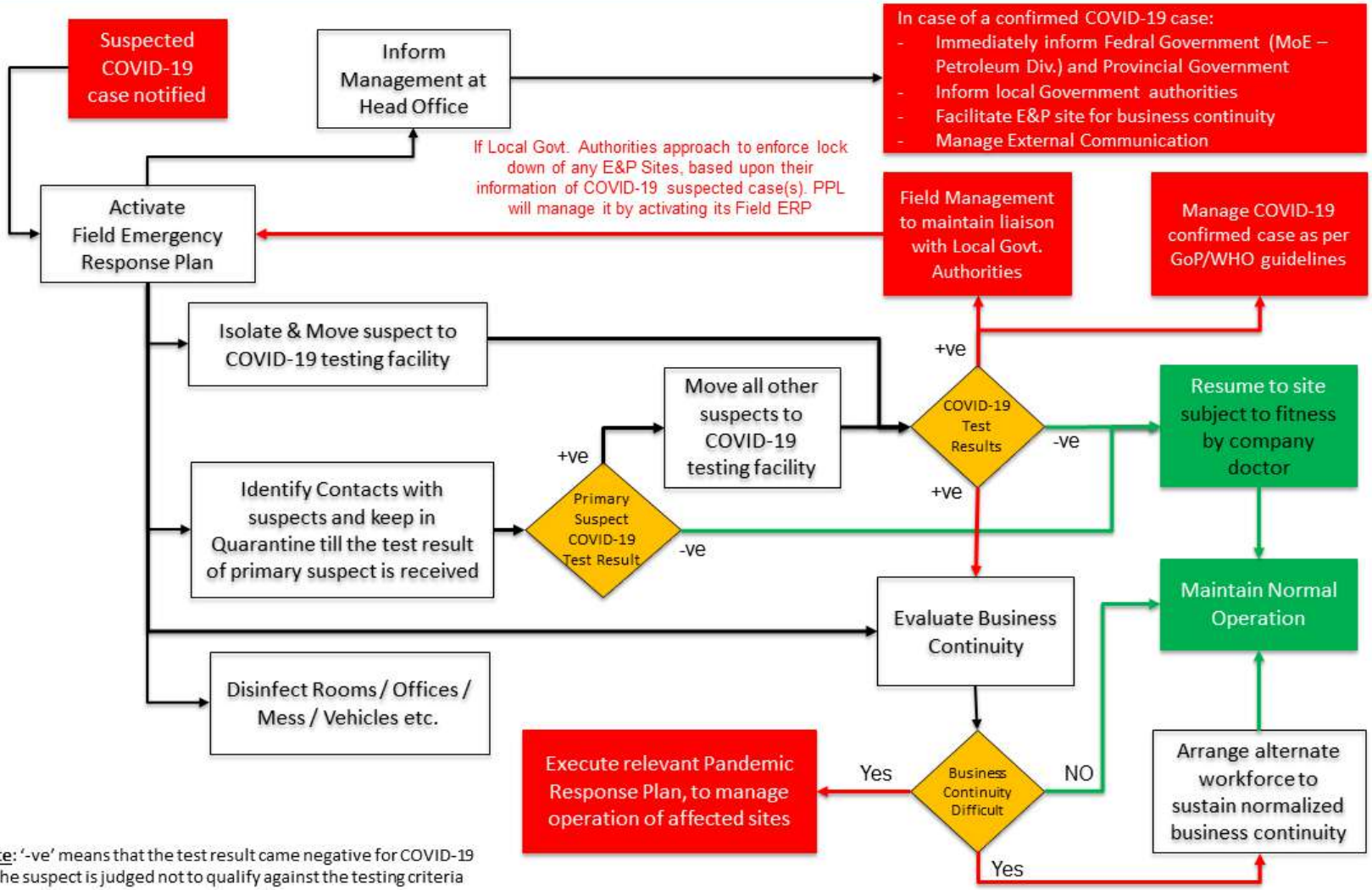
1. Site Management shall identify and trace individuals who may have been in close contact with suspected/positive case.
2. Isolate contact(s) – provide surgical mask and gloves to prevent local transmission of infection.
3. If the primary suspect is tested positive, all contacts will proceed for testing as per doctor's advice. Incase contact(s) is / are:
   a. Tested positive, proceed as per GOP guidelines and as advised by testing facility.
   b. Tested negative, return to work subject to assessment and fitness confirmation by the company's doctor.
4. In case the primary suspect testing is denied (as happens when a patient does not fulfill the testing criteria at the facility), the contact(s) shall resume duty subject to assessment and fitness confirmation by the company's doctor.
5. In case the primary suspect is tested negative, all contacts under isolation shall resume site duty.

CONTINUING UNINTERRUPTED OPERATION

Once suspected case(s) are moved for testing and all areas are disinfected, PPL's Management shall make all possible efforts to continue their site operations. Efforts will be made to arrange essential crew and continue operating. In all such eventualities, PPL Management will be in close contact with district and provincial administration and may seek their support. This may include but not be limited to provision of security, smooth transportation and logistical cover and provision of ambulances etc. (if PPL is unable to manage within their own resources).

However, in case situation is unsustainable beyond the control, PPL may decide to cease or temporarily shut down the operations in which case the Federal Government (Ministry of Energy - Petroleum Division), Provincial Government and local administration shall immediately be informed.

COVID-19 Suspected Case Management at PPL Operated Sites



Note: '-ve' means that the test result came negative for COVID-19 or the suspect is judged not to qualify against the testing criteria

Material Required for Managing COVID-19 situation at PPL offices

S. No.	Item Description	Usage Requirement	Quantity Required	Responsibility
01	Plain Surgical Masks	At entrance of Office premises by PPL Employees, Contract Staff, Visitors, Material Delivery Staff, Janitorial, Maintenance, IT Support Staff, any other person entering office	As per the attendance record (staff / contractor / visitors)	**Medical Services / Procurement**
02	Sanitizers	At the entrance	Head office: 04 at entrance Other locations: 02 per entry	**Respective Admin / Procurement**
		At department / office entrance	01 Sanitizer at each entrance	
05	Alcohol Wipes	For wiping electronics such as keyboards, telephone sets, mouse, printers, screens, etc. by janitorial staff and by office staff	Based on employee strength at respective office	**Respective Admin / Procurement**
06	Disinfectants Solutions - Diluted bleach (Sodium hypochlorite) - Hydrogen peroxide - Alcohol solutions with at least 70% alcohol content - Other recommended disinfectants	Common surfaces disinfection inside office and incoming goods disinfection	To be estimated by respective Admin based on the area	**Respective Admin / QHSE / Procurement**
07	Disposable Cups & Glasses	For staff & visitors use	Based on employee / visitor's strength at respective office	**Respective Admin / Procurement**
08	PPEs for Janitorial Staff (Rubber Gloves) & Other as per Manufacturer	For disinfection	To be estimated by respective Admin	**Janitorial Contractor / Respective Admin**

CORONA VIRUS – CORPORATE ADVISORY

Dear All

Official confirmation of recent cases of Corona Virus in the country has necessitated need for enhanced focus on this developing risk. Accordingly at a high level meeting of the senior leaders, protection of company works force from the potential infection was highlighted as the key priority, in this connection following steps are being implemented on immediate basis:

- Staff who have travelled to China, Iran, Afghanistan, South Korea & Thailand (current list, will be updated as needed) in last 14 days are to inform Medical Services, HO upon their return; they will be asked to work from home and will rejoin duty after completion of 14 days from date of arrival in Pakistan. SMMS will advise the concerned staff for specific precautions to be taken including any diagnostic tests when needed. SMMS will also inform relevant Line Manager and HR.

- Staff who develop upper respiratory tract infection along with general flu symptoms such as fever and cough will report their condition to Medical Services on phone; as a precaution they will be advised medical leave/ work from home as per doctor's assessment. Specific advise on precuations and diagnostic tests shall be provided by Medical services, HO along with the approval to resume duty when deemed fit. This will also apply to field based company staff who are on rotation break.

- Staff working at field locations who develop upper respiratory tract infection while on duty along with general flu symptoms such as fever and cough will report their condition to relevant field doctor. Upon cosnultation and confirmation from Company doctor at medical services, HO; the affected staff may be moved to a suitable medical facility for treatment and further diagnostic as needed.

- All Field/ Site based staff on resumption of field duty will first report to field doctor for mandatory general check up and recent medical history update; in case of a potential cause of concern, specific course of action will be decided in consultation with Medical sevices, HO.

- All foreign travelling requests will be scrutinized by Human Resource Dept. and decision will be taken in consultation with Medical Services Dept.

- An advisory covering key requirements for infectious diseases prevention for catering services and food handling staff is being developed to be circulated for compliance at all company locations.

- Hand sanitizer are being installed at exists of each department at HO and all frequently accessed areas at Fields.

- Appropriate facemask are being procured for any emergency usage.

- Awareness sessions on Corona Virus will continue to be arranged at HO and field locations; these will include sample Frequently asked questions (FAQs).

- Drilling department is to continue their current practices for prevention of Corona Virus including restrictions on rotation of expat staff, imposition of 14 days quarantine requirements of expat staff reporting to duty in Pakistan, mandatory medical screening for contractor staff and general hygienic inspections.

- Any visit of expat consultants/ specialists/ support staff to work sites requires prior formal authorization by relevant DMD.

Related link:

FOOD SAFETY AND KITCHEN HYGIENE

In the developing Corona Virus situation, World Health Organization (WHO) has advised standard recommendations to reduce exposure to and prevention of transmission of a range of illnesses are to be maintained.

Accordingly following guidelines covering food preparation and handling are being re-issued for immediate implementation at PPL operated locations; these will include Karachi Head Office, Islamabad Office, West Wharf facility, all Operating plants, drilling rigs, construction sites and any other location under direct executive control of PPL officials. Implementation of these are the responsibility of respective Admin department heads / Camp bosses. Site based HSE staff and medical staff are required to conduct inspection, monitoring and reporting protocols to ensure compliance and conduct awareness sessions for the same.

Requirements for Food Safety

- Maintaining proper hygienic conditions, by washing hands, wearing clean outer garments and headgear, keeping open cut / abrasion of exposed body part covered with suitable waterproof dressing
- Storage, preparation and serving of food free from contamination risk
- Maintaining raw & cooked food separately
- Thorough cooking of food specially meat, poultry, eggs and seafood
- Keeping food at safe temperatures
- Usage of safe raw material and water

Precautions for food handlers

Food handlers must ensure personal, food material and equipment hygiene, following practices are to be adopted as responsibilities of food handlers:

- Wash hands before handling food, during food preparation, after handling waste, after cleaning surfaces, after using toilet, blowing nose, sneezing or coughing and after smoking or handling money
- Wash and sanitize all surfaces and equipment used for food preparation
- Use separate equipment and utensils such as knives and cutting boards for handling raw food
- Serve cooked food sizzling hot (more than 60OC)
- Do not leave cooked food at room temperature for more than 2 hours, refrigerate all cooked food (preferably below 5OC)
- Do not store food too long even in the refrigerator
- Select fresh vegetables / fruits and wash specially if eaten raw
- Do not use food beyond its expiry date

- Food waste and other refuse to be properly stored in watertight, durable and nonabsorbent containers with tight-fitting or self-closing lids

Hand wash technique

Performed either by hand rubbing with an alcohol-based formulation or handwashing with plain or antimicrobial soap and water.

- Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
- Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
- Scrub your hands for at least 20 seconds.
- Rinse your hands well under clean, running water.
- Dry your hands using a clean towel or air dry them.

Training and awareness of food handlers

Capacity building, awareness sessions and refresher trainings should be considered for food handlers in respect of requirements identified under food safety.

Medical department to conduct awareness sessions on Coronavirus precautions and Food Hygiene as needed.

Medical examination and evaluation of food handlers

All food handlers must undergo periodical medical examinations to determine that they are healthy and free from infection.

If food handler has contracted any form of communicable disease, or has become a carrier of such disease, food handler must be isolated and concern management to be immediately notified.

No person who have a communicable disease or carrier of such disease is permitted to work.

General Recommendations

- Awareness of food handlers on Coronavirus situation
- Usage of hand gloves, face mask and head net during all kitchen activities
- Adopt First in and First out (FIFO) approach while dealing with all food items
- Temperature of Deep freezers and fridge to be maintained properly at all times
- Keep thermometer inside refrigerators for proper temperature monitoring
- Keep kitchen area clean with bleach and disinfectant mopping
- Placement of hand sanitizers at kitchen entrance/exit

Source references

- https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200221-sitrep-32-covid-19.pdf?sfvrsn=4802d089_2

- https://apps.who.int/iris/bitstream/handle/10665/43546/9789241594639_eng.pdf;jsessionid=92DDE7541B2DB7A8F6A68C9DBED93297?sequence=1
- https://apps.who.int/iris/bitstream/handle/10665/37133/WHO_OFFSET_34.pdf?sequence=1&isAllowed=y
- https://www.cdc.gov/handwashing/when-how-handwashing.html

Related link: