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EXECUTIVE SUMMARY

Title and Location of Project

The title of the project is "Construction of Limekiln by M/S AMEER TRADERS LIME MERCHANTS Near Fim Kassar Dhudial in District Chakwal".

Name of the Proponent

The details of the proponent are given below;

Details of Proponent	
Name of the Proponent	MR. MUHAMMAD FAROOQ
Address	Office no 61. 3rd floor Computer Acade Plaza Opp. Al Fateh Sports Complex Chen One Road, Faislabad,

Name of Consultant Preparing the Report

The name of the consultant preparing the report is as given below;

Contact Details	
Consultant	Prime Environmental Consultants
Contact	(+92) 321-7860915
e-Mail	primeenvironmentalconsultants@gmail.com

The team involved in preparing the report is as;

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Ammara Afzal	Environmental Scientist M.s Environmental Science	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report

2.	Zeba Haseeb	Environmental Scientist M.S Environmental Science	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
3.	Umer Saeed	Environmental Scientist M.S Environmental Science	• Site visits

Brief Outline of the Project

The project area lies over 02 Acres and involves involves seeking a No Objection Certificate (NOC) for an already operational small-scale limekiln (chalk kiln), established to produce Lime through the calcination of limestone (chalk). The project is located near Fim Kassar dhudial in District Chakwal of Punjab.

In Pakistan, limestone is mainly used in the cement industry, lime manufacturing, and as a building material. Total production of the country was about 28.0 million tons during the year 1996-97. In the 2010-2011 financial year, which ended on 30 June 2012, Pakistan produced around 32.1 Mt of limestone, with Punjab contributing about 18.5 Mt of the total. The current production of limestone is estimated at around 35 to 40 million tons per annum.

Limestone is reported from the Salt Range and Potwar Plateau, Sulaiman and Kirthar ranges, and the western fold belts of Pakistan. It also occurs in the Khyber-Hazara (uppermost Indus) basin, such as in Abbottabad and Hazara areas. Major deposits are found in Daudkhel, Khewra, D.G. Khan, and Rajanpur areas of Punjab; Karak, Kohat, and D.I. Khan areas of Khyber Pakhtunkhwa; Barkhan, Dera Bugti, Kohlu, Musa Khel, and Sibi districts of Balochistan; as well as Dadu, Jamshoro, and Thatta districts of Sindh. Smaller deposits are present in Las Bela, Chagai, and coastal areas of Balochistan, and in Muzaffarabad and Neelum districts of Azad Kashmir. The Salt Range contains extensive high-

purity limestone reserves that are among the most important for the cement industry in Pakistan.

Limestone is a highly useful industrial mineral. It is extensively used as a construction material, most of which is processed into crushed stone for building, aggregate for concrete, or raw material for cement manufacturing. Some limestone deposits contain high calcium carbonate content, exceeding 95%, which is excellent for producing high-grade lime and cement. Raw limestone can be processed into a variety of products such as quicklime, hydrated lime, portland cement clinker, building aggregates, and as a flux in the metallurgical industry.

The main objectives of Limekiln construction are:

- To seek formal approval (NOC) for an already operational, cost-effective, and locally sourced lime production unit
- To continue utilizing the abundant limestone (chalk) deposits in the Chakwal region
- To meet the growing local demand for Lime in construction, agriculture, and industrial processes
- To sustain employment opportunities and contribute to rural economic development
- To maintain and improve environmentally responsible small-scale mining and processing practices

Major Impacts

Key impacts related to the construction phase include:

- Construction Noise
- Solid Waste
- Soil Contamination
- Air Pollution
- Community and Workers' Safety

- Employment Conflicts

Mitigation measures recommended to be incorporated into the project include running the machines and vehicles on good quality (low-sulfur fuels) in good working order ensuring regular maintenance, tuning and servicing, and providing them with emission control devices, such as mufflers and silencers, etc. Water suppression and covered transportation and storage of the construction materials and slow driving on unpaved roads will control dust emission. Regular testing for leakage detection will also be ensured. Solid waste of construction activities will be used for flooring, while the remaining solid waste will be managed as per practices in the area. For community safety, irrelevant persons will not be allowed inside. Safety of the workers will be ensured by discouraging any careless attitude of workers and providing the workers with, and encouraging them to use PPEs. Details analysis is given in **chapter 7.**

Key impacts related to the operation phase include:

- Wastewater
- Solid Waste
- Noise
- Impacts on Air Quality
- Acid Mine drainage
- Soil Contamination

Detailed analysis of operational impacts is given in chapter 7.

Recommendations for Mitigation Measures

The potential environmental impacts resulting during construction and operational phase of the project and their possible mitigation measures are given in table below

- **Construction Phase:**

Potential Negative Impacts	**Recommended Mitigation Measures**	**Monitoring Responsibility**	**Parameters for Monitoring**
Dust emissions	On exposed construction surface during windy periods fugitive dust generation will be suppressed by spraying water.	Proponent/ contractor	Air quality
	The construction material will be covered with polyethylene sheets to prevent dust emissions.		
Soil erosion	Exposed surface will be resurfaced and stabilized as soon as possible.	Proponent/ contractor	Soil
Solid waste generation	Solid waste may include waste/unused construction materials, which should be disposed of properly.	Proponent/ contractor	Solid waste management

Vehicular Traffic and Noise	Vehicles and other noisy equipment will be kept in good conditions and their regular maintenance will be done.	Proponent/ contractor	Noise level
	Noisy construction activities will be carried out only during normal working hours.		
Health and Safety of Work Force	The contractor will ensure that the workers are trained in safety procedures for all relevant aspects of construction.	Proponent/ contractor	Health and safety
	Regular checks will be made to ensure that the contractor is following safety working procedures/safety measures.		
	Formal emergency procedures will be developed for construction site in case of an accident.		

	First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contacted in case of any accident.		
	Waste produced during construction phase will be collected by vehicle for dispose of it at a particular dumping site of the industrial estate from it will be reused. Waste segregation units will be provided. Recyclable items will be provided to recycling contractors		
Water supply	Water use will be planned depending upon the supply and timing to avoid and inconvenience.	Proponent/ contractor	Water supply
	Water conservation practices will be adopted.		

Surface and Groundwater	At project site, the septic tank will be installed the safe disposal of wastewater into the nearby drain. The storage of lubricant materials such as oil and grease will be confined to a specific area so that in case of any leakage or spillage, the lubricant materials do not contaminate the entire project site.	Proponent/ contractor	Surface and groundwater

- **Operational Phase:**

Potential Negative Impacts	**Recommended Mitigation Measures**	**Monitoring Responsibility**	**Parameters for Monitoring**
Dust emissions	In operational phase, dust generation by vehicles will be suppressed by spraying water. Scrubbers will be used to control dust emissions	Proponent	Air quality
Noise	Use of PPEs (noise suppression equipment-ear mufflers etc.) will be ensured by the workers where noise	Proponent	Noise

	levels are higher than 85 (dBA). Mining activities will be ensured at daytime when background noise levels are high. Vehicles speed limit will be maintained to avoid excessive vibrations. Regular maintenance of machinery will be ensured. No blasting operations will be carried out.		
Waste water	Water conservation practices will be used. Wastewater will be treated properly by septic tank and will be discharged into nearby drain. Water use will be planned depending upon the supply and timing to avoid and inconvenience	Proponent	Wastewater management
Flora and fauna	The unit includes a plan of the green yard area which is a positive impact on the flora and fauna. There is no significant fauna in that area. However, it is suggested that maximum number of trees should be planted by the	Proponent	Biodiversity

	management inside and outside the boundary wall in order to enhance aesthetics of the area.		
Social impacts	During the operation stage, there will be no social issue for the nearby localities. Moreover, the residents may get opportunities to work in the refining unit which is a major positive impact of the project.	Proponent	Social impacts
Occupational health and safety	There may be occupational health and safety risks associated with different operational activities. Health risks may occur in case of unsafe and/or unfavorable work conditions The mitigation measures include: The workers should get trained in safety procedures for all relevant aspects of processes. Enforcement of work safety measures.	Proponent	Health & safety

	Formal emergency procedures will be developed for the segregation hall in case of any accident. First aid kits and other personal protective equipment (safety gloves, goggles, welding shields etc.) Should be kept available.		

Proposed Monitoring

The EMP is prepared to ensure that the activities are undertaken in a responsible & non detrimental manner with the objectives of:

- Providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance.
- Guiding and controlling the implementation of findings and recommendations of the environmental assessment.
- Detailing specific actions deemed necessary to assist in mitigating the environmental impact.
- Ensuring that safety recommendations.

  Furthermore, the detailed EMMP has been given in **chapter 8**.

1. SCREENING

1.1. Screening

Section 12 of Punjab Environmental Protection Act (PEPA), 1997 (Amended 2012) states:

"***No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies an environmental examination (IEE), as the case may be, or, where the project is likely to cause an adverse environmental effect an Environmental Impact Assessment (EIA), and has obtained from the Government Agency approval in respect thereof***."

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), current project falls under Schedule II (List of projects requiring IEE).

2. INTRODUCTION

2.1. Purpose of the Report

This report has been prepared to conform to the requirements of the Punjab Environmental Protection (Amendment) Act 2012 (PEPA), which states that:

"***No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an initial environmental examination (IEE)or where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained from the Provincial Agency approval in respect thereof.*"**

Initial Environmental Examination (IEE) report is being submitted to the environmental protection agency (EPA), government of the Punjab, Lahore in compliance with the legal requirements for Punjab Environmental Protection Act-1997 (amended 2012), section-12 for obtaining the environmental approval (EA) at the project site. The other relevant regulations and guidelines considered while preparing this IEE report will include:

- Policy and procedures for filling, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed Sectoral guidelines.

Different environmental aspects like social, physical, biological etc and other related features of the project are highlighted in this IEE report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired environmental approval.

The main objective of the IEE study is to assess the environmental impacts likely to occur due to the construction of the roads improvement project, and to suggest mitigation measures to minimize the likely negative impacts. For achieving the above objectives, the study was mainly divided into following sectors:

- Identification of all requirements as set forth by Pakistan Environmental Protection Act. 1997 and the Guidelines for preparation of IEE reports, etc.
- Study of existing regulatory framework in Pakistan with reference to the developmental projects;
- Study of Guidelines for the preparation of IEE reports;
- Collection and scrutinizing data related to physical, ecological and socioeconomic, and physical recourses of the project area;
- Evaluation of data and identification of significant environmental impacts;
- Identification of necessary mitigation measures to minimize the negative impacts; and
- Preparation of an Environmental Management Plan.

2.2. Identification of the Project and Proponent

2.2.1. Details of the Project

The project title is "Construction of Limekiln by M/S AMEER TRADERS LIME MERCHANTS Near Fim Kassar Dhudial in District Chakwal".

2.2.2. Details of the Proponent

The details of the proponent are given in Table 2-1;

Table 2-1Details of the Proponent

Details of Proponent	
Name of the Proponent	MR. MUHAMMAD FAROOQ

Address	OFFICE NO. 61, 3RD FLOOR COMPUTER ARCADE PLAZA, OPP. AL FATEH SPORTS COMPLEX, CHEN ONE ROAD, FAISALABAD

2.3. Details of Consultant

The details of the consultant are given in Table 2-2;

Table 2-2 Details of the Consultant

Contact Details	
Consultant	Prime Environmental Consultants
Contact	(+92) 336-4400615
e-Mail	primeenvironmentalconsultants@gmail.com

The team carrying out the project impact assessment is presented in the Table 2-3.

Table 2-3 Consultant Team

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Ammara Afzal	Environmental Scientist M.s Environmental Science	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
2.	Zeba Haseeb	Environmental Scientist M.S Environmental Science	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
3.	Umer Saeed	Environmental Scientist M.S Environmental Science	• Site visits

2.4. Brief Description of Nature, Size and location of the Project

The project is about Construction of Limekiln by M/S AMEER TRADERS LIME MERCHANTS Near Fim Kassar Dhudial in District Chakwal.

In Pakistan, limestone is mainly used in the cement industry, lime manufacturing, and as a building material. Total production of the country was about 28.0 million tons during the year 1996-97. In the 2010-2011 financial year, which ended on 30 June 2012, Pakistan produced around 32.1 Mt of limestone, with Punjab contributing about 18.5 Mt of the total. The current production of limestone is estimated at around 35 to 40 million tons per annum.

Limestone is reported from the Salt Range and Potwar Plateau, Sulaiman and Kirthar ranges, and the western fold belts of Pakistan. It also occurs in the Khyber-Hazara (uppermost Indus) basin, such as in Abbottabad and Hazara areas. Major deposits are found in Daudkhel, Khewra, D.G. Khan, and Rajanpur areas of Punjab; Karak, Kohat, and D.I. Khan areas of Khyber Pakhtunkhwa; Barkhan, Dera Bugti, Kohlu, Musa Khel, and Sibi districts of Balochistan; as well as Dadu, Jamshoro, and Thatta districts of Sindh. Smaller deposits are present in Las Bela, Chagai, and coastal areas of Balochistan, and in Muzaffarabad and Neelum districts of Azad Kashmir. The Salt Range contains extensive high-purity limestone reserves that are among the most important for the cement industry in Pakistan.

Limestone is a highly useful industrial mineral. It is extensively used as a construction material, most of which is processed into crushed stone for building, aggregate for concrete, or raw material for cement manufacturing. Some limestone deposits contain high calcium carbonate content, exceeding 95%, which is excellent for producing high-grade lime and cement. Raw limestone can be processed into a variety of products such as quicklime, hydrated lime, portland cement clinker, building aggregates, and as a flux in the metallurgical industry.[AM1]

Limekilns in Pakistan are an important part of the country's industrial sector, producing burnt lime (quicklime) and hydrated lime for diverse applications. The industry is concentrated in areas with abundant high-quality limestone deposits, such as Hassan Abdal, Taxila, Chakwal, Khushab, and parts of Khyber Pakhtunkhwa and Balochistan. Traditional vertical shaft kilns are common, although modernized continuous kilns are gradually being introduced to improve efficiency and reduce emissions.

Burnt lime is mainly used in the steel and sugar industries, chemical manufacturing, water treatment, and construction. In Pakistan, limekilns often operate on coal, natural gas, or wood as fuel, with production capacities ranging from a few tonnes per day for small-scale units to over 200 tonnes per day for larger industrial setups.

The main objectives of construction of Limekiln are:

- To seek formal approval (NOC) for an already operational, cost-effective, and locally sourced lime production unit
- To continue utilizing the abundant limestone (chalk) deposits in the Chakwal region
- To meet the growing local demand for Lime in construction, agriculture, and industrial processes
- To sustain employment opportunities and contribute to rural economic development
- To maintain and improve environmentally responsible small-scale mining and processing practices

The location of the proposed project is given below;

Figure 2-1 Location of the Project

3. DESCRIPTION OF THE PROJECT

3.1. Type and Category of the Project

The said project involves the preparation of Lime Burnt in Lime Kiln through Limestone. The project falls in Schedule-II, of Punjab Environmental Protection Agency's (Review of IEE and EIA) Regulations, 2000 (Amended 2023). The Proponent of the project has engaged Prime Environmental Consultants to undertake Initial Environmental Examination (IEE) study of the project. The project is already operational having multiple gas kiln plants operational.

3.2. Objectives of the Project

- To seek formal approval (NOC) for an already operational, cost-effective, and locally sourced lime production unit
- To continue utilizing the abundant limestone (chalk) deposits in the Chakwal region
- To meet the growing local demand for Lime in construction, agriculture, and industrial processes
- To sustain employment opportunities and contribute to rural economic development
- To maintain and improve environmentally responsible small-scale mining and processing practices

3.3. Alternative considered realistically and reason for their rejection

No other site was considered for construction of Limekiln. Among the main considerations for selection of project site include:

a. Roads and other basic infrastructure:

The availability of good roads facilitates movement of Limekiln at cheaper cost. The other basic facilities are vitally important for the entire business to be run. These facilities also go in favor of the present site selection for the project.

b. Availability of Labor:

Cheap labor is easily available in the project area in more than desired number. This also makes the site also suitable. All categories of the labor required for the project operation are available conveniently and plentifully at affordable cost at the present site. This factor too supports to select the present site for the said project.

c. Basic infrastructure and facilities:

Basic infrastructure like water, roads, transport, repair and maintenance workshops and communication facilities like telephone, e-mail are already available virtually at the project site. This factor also goes in favor of selecting the present site.

d. Environment

And lastly, environmental considerations are extremely important. The land around the project area is entirely open. Settings around the project area do not show any sensitivity of environment. There is no worth mentioning forestry, biodiversity, fishery, flora and fauna, heritage etc. No important religious, archaeological, recreational site, ecologically sensitive, declared protected area and human settlements exists within close vicinity of the selected site i.e., within 100 m which is considered to be a safe distance.

Following are other some of the additional parameters that favor Limekiln construction in the respective region:

i. Favorable geology in the surrounding region ensuring a consistent supply of quality limestone from existing legal sources.

ii. Availability of processed and sized limestone from nearby suppliers, eliminating the need for mining activities.
iii. The project operation does not involve displacement or relocation of human settlements.
iv. The lime production facility will create job opportunities for local people and improve their socio-economic status.
v. Lime production will contribute positively to the income stream of the national exchequer as well as the GDP.
vi. Transportation of raw limestone to the kiln site and delivery of finished lime to the market is easily accessible via existing road networks.
vii. The project has a sustainable operational lifespan due to assured raw material supply and market demand.
viii. Moreover, there is no railway line, reservoir, canal, or public building within 2 km distance of the kiln site.

In view of these facts, it can be concluded that the chosen site per force is fixed. Considering the facts that mine site is at a safe distance from sensitive receptors and has advantage of not only to be environmentally friendly but also potentially sound to enhance sustainable development in the region. Therefore, given site is the most suitable.

3.4. Design/technology alternatives, their selection and rejection criteria

Limestone will be sourced from existing licensed suppliers in the Hassan Abdal area, and the project will only involve its processing into lime. As no mining or blasting activities are involved, no alternative extraction technologies have been considered, making the project operationally simple and environmentally friendly.

3.5. Environmental Alternatives, their selection and rejection criteria

The project involves the processing of limestone sourced from Hassan Abdal through environmentally friendly means; therefore, no environmental alternatives have been considered, as the project is inherently environmentally sustainable.

3.6. Economic Alternatives, their selection and rejection criteria

The project activities are environmentally friendly, and the processing method is economically efficient. As the project only involves the processing of limestone sourced from Hassan Abdal, there is no alternative raw material available at the project site. All machinery, equipment, and materials procured for the project will be environmentally friendly and sustainable. Therefore, no material alternatives have been considered in this case, as limestone is the sole raw material to be used.

3.7. Location and Site Layout of the Project

The project location is represented in Figure No. 3-1 and more detailed colored image is present in ***Appendix VIII*** on A3 size.

Figure 3-1 Location of the Project

The project boundary falls within mainly inhabited and presently unused area. The coordinates of the Limekiln lease area are given in Table No. 3-1.

Table 3-1 Coordinates of the Limekiln Lease Area

Points	Latitude	Longitude
A	33°04'31.9"N	72°56'52.1"E

3.8. Land Use on the Site

The land is not agricultural land. As the project involves only the processing of limestone sourced from external suppliers, no mining will be carried out on-site, and no significant change to the land surface will occur.

3.9. Road Access

Road is in easy and close access of the proposed project site.

3.10. Vegetation Features of the Site

There is no vegetation cover on the project site. The area free of any vast tree cover and dense vegetation.

3.11. Cost and the Magnitude of Operation

The capital cost of the project is Rs. 15 million. No mining activities will be undertaken within this area, as the project will be limited to the processing of limestone sourced from external licensed suppliers.

3.12. Schedule of Implementation

The Project plans to be completed within 3 to 6 months after getting requisite approvals and NOCs from authorities.

3.12.1. Manpower

The man power required for Limekiln mining is described in Table4-4.

Table 3-2: List of Manpower for Limekiln Mining Operations

Sr. No.	Category of Staff	Strength
1.	Kiln Operations Supervisor	01
2.	Kiln Process Inspector	01
3.	Shift In-Charge / Foreman	01
4.	Material Handling Operator	01
5.	Kiln Burner / Firing Operator	01
6.	Water Pump Operator	02
7.	Electrical Technician	01
8.	Accounts & Admin Officer	01 [AM2]
Total		09

3.12.2. Water Requirements

The main water requirement is for drinking purposes only, with no water consumption in the limestone processing operations. Workers are provided with approximately 2–3 liters of potable water per person per day.

3.12.3. Description of the Project (Process Flow Chart) [AM3][AM4]

The project activities are carried out in a well-coordinated manner. From site preparation to limestone processing and final product handling, supervisors and workers are trained to understand the operational requirements and the sensitivity of environmental and safety considerations.

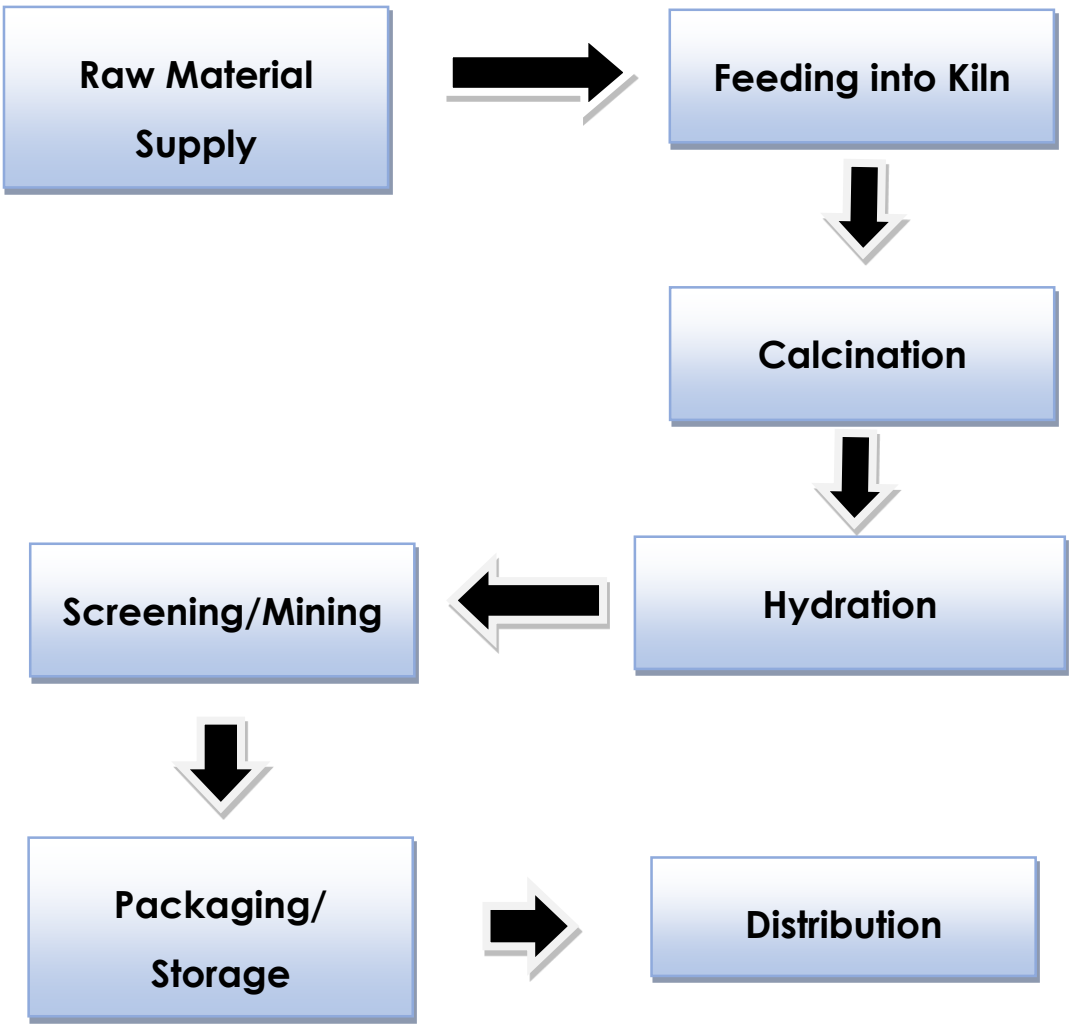


Figure 3-2: Process Flow Chart

- **Processing Operations**

The project will operate on a small scale and will not involve any mining activities. Limestone will be sourced from licensed suppliers in the Hassan Abdal area. Upon arrival at the project site, the limestone will be fed into the kiln for processing into quicklime. The processed lime will then be packed and distributed to the market via trucks. No blasting or excavation will be carried out at the project site. A brief description of all of these process is given next.

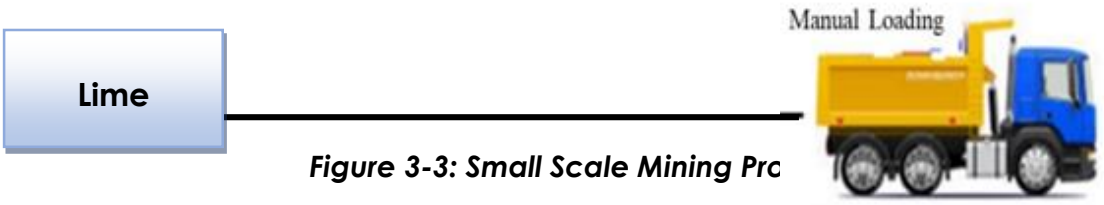


Figure 3-3: Small Scale Mining Pro

- **Limestone Supply**

High-quality limestone is sourced from Hassan Abdal due to its high calcium carbonate content and low impurities. The material is transported to the limekiln site in bulk and inspected upon arrival to ensure it meets the required size and quality specifications.

- **Feeding into Kiln**

The limestone is loaded into a controlled feeding system that regulates the amount and size of the stone entering the kiln. Proper feeding ensures even heating and optimal calcination efficiency.

- **Calcination**

Inside the kiln, the limestone is heated to temperatures between 900°C and 1,000°C. At this temperature, calcium carbonate ($CaCO_3$) decomposes into quicklime (CaO) while releasing carbon dioxide (CO_2) gas. This step is critical, as incomplete calcination affects the final lime quality.

- **Hydration**

The hot quicklime is transferred to a hydration unit where it is carefully mixed with a controlled amount of water. This chemical reaction converts quicklime into hydrated lime ($Ca(OH)_2$), also known simply as "lime," releasing heat in the process.

- **Screening**

The hydrated lime is cooled and passed through screening or milling equipment to achieve the desired particle size. This ensures uniformity and makes the product suitable for various applications.

- **Packaging/ Storage**

The finished lime is either packed in bags or stored in bulk silos, depending on customer requirements. Proper packaging prevents moisture absorption, which could reduce product quality.

- **Distribution**

The packaged or bulk lime is loaded onto trucks for delivery to customers in industries such as construction, chemical processing, water treatment, and agriculture.

3.13. Restoration and Rehabilitation Plans

Following steps can be done by guessing the restoration and restoration of the area:

- As no mining activities will be undertaken at the project site, there will be no waste dumps, tailings dams, or open pits requiring rehabilitation.
- The project land will remain largely unchanged in its physical form, with only the kiln and associated infrastructure installed for limestone processing.
- No human settlement within the project area will be removed, and no valuable buildings will be relocated or demolished.
- The land is non-agricultural and holds value primarily for industrial activity; therefore, the question of land reclamation after mining does not arise.

- All equipment and operational areas will be properly maintained, and unused portions of the site can be landscaped or developed for ancillary uses, such as small-scale tourism or demonstration of lime production, after the end of operations.
- Since raw material will be sourced from licensed limestone suppliers in Hassan Abdal, the project will avoid direct environmental disturbance associated with mining.

Table 3-4 Restoration and Rehabilitation Plans

Measures for Land Rehabilitation & Restoration	**During Project Operation**	**Responsible Party**
There exists no human settlement within the safe radius of the selected project site to be displaced owing to the kiln operations. No structure of any significance stands at the site to be relocated or dismantled. As no mining activities will be undertaken and raw material will be sourced from licensed limestone suppliers in Hassan Abdal, no relocation or rehabilitation is required..		-
The importance of the site lies in its economic activity; otherwise, it is essentially barren land. As no mining activities will be carried out at the project site, the question of rehabilitation does not arise, except for possible landscaping or development of unused areas after the end of operations		Proponent
The isolated site can be used for small-scale tourism or demonstration of lime production to visitors, generating alternate economic activity after the end of kiln operations.	After Project Closure	MMD
The site can be used for re-stocking livestock as an alternate economic activity after the end of kiln operations.		MMD/ Livestock Department

Trees will be planted within the project area using dry afforestation techniques, contributing to significant improvement in the overall ecology of the site.	After Project Closure	Proponent
The land will remain suitable for industrial or ancillary uses, such as landscaping, small-scale tourism, or demonstration of lime production, after the end of kiln operations.		MMD/ Concerned Authority
The site will be restored and landscaped for recreational and eco-tourism purposes, providing green spaces for visitors while supporting biodiversity and ecological balance."	Till Lease Tenure / Operational Period	MMD/ Concerned Authority[AM5]

4. DESCRIPTION OF THE ENVIRONMENT

The existing environment in the project area has been studied with respect to the physical, biological and socio-economic resources.

4.1. Baseline Physical Environment

Physical resources of the proposed study area include geology, topography, soil, climate, meteorology, ambient air quality, surface water, ground water and other existing pollutants prior to the operation of the project.

Chakwal District is in Pothohar Plateau of Punjab, Pakistan. It is located in the north of the Punjab province, Chakwal district is bordered by Khushab to its south, Rawalpindi to its north east, Jhelum to its east, Mianwali to its west and Attock to its north west. The district was created out of parts of Jhelum and Attock in 1985. Based on geography, topography and geology, the project area is briefly described below:

4.1.1. Topography and Geology

The study area is hilly and sub mountainous. The topography is rugged and elevation ranges from the 450 m to 500 m above the sea level. Hill torrents are present in the area which mostly runs from the north to south and drain the rain and storm water of the hilly area into deeper valleys and places. Population of the study area is about 25,000 including temporary settlements in that area. There is no such historical place is present in the study area. Mostly people of that area are in army and other part of the country for their income. Agriculture is rare due to the calcareous and mountainous region.

4.1.2. Meteorology of the District Chakwal

Chakwal is located in the Dhanni region of the Potohar in northern Punjab, which is a semiarid area with a shortage of irrigation systems and water sources for agriculture. Over 70% of the population engages in agriculture, mostly

subsistence agriculture dependent on rainfall. Monthly average rainfall of base line period (1981-2010) is displayed in Figure below.

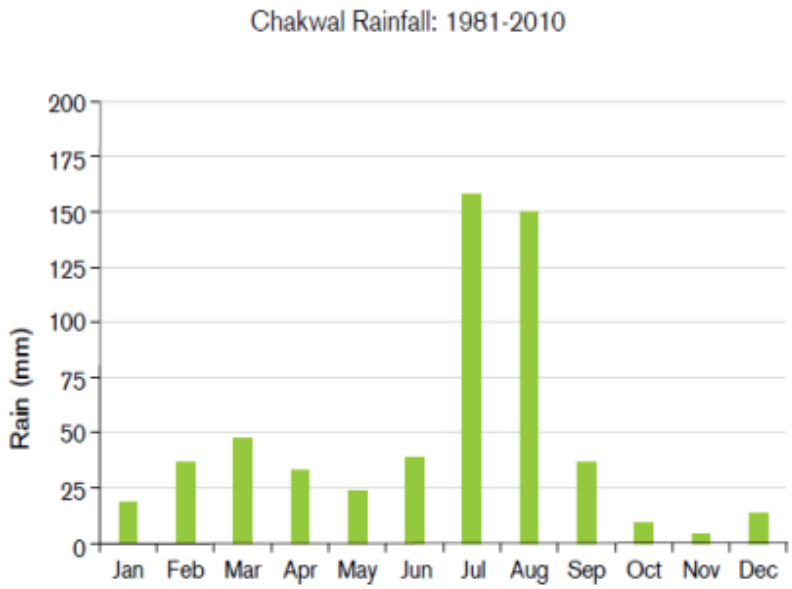
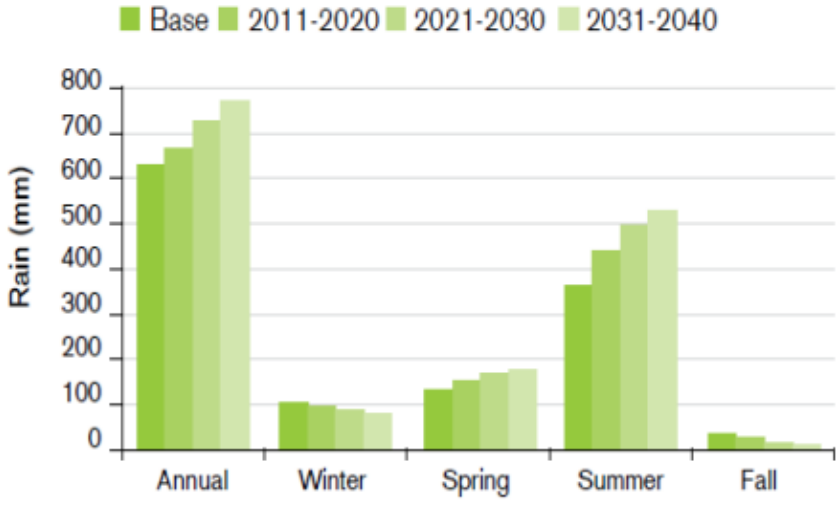


Figure 4-1Monthly rainfall data of chakwal

The computed rainfall scenarios using the base line data of 1981-2010, for each season with departures from base line period and the preceding decades are given below graph.



4.1.3. Temperature

The mean monthly maximum and minimum temperatures, according to the base line data (1981-2010) are displayed in the Figure below. The annual average temperature of Chakwal District is 29.6°C.

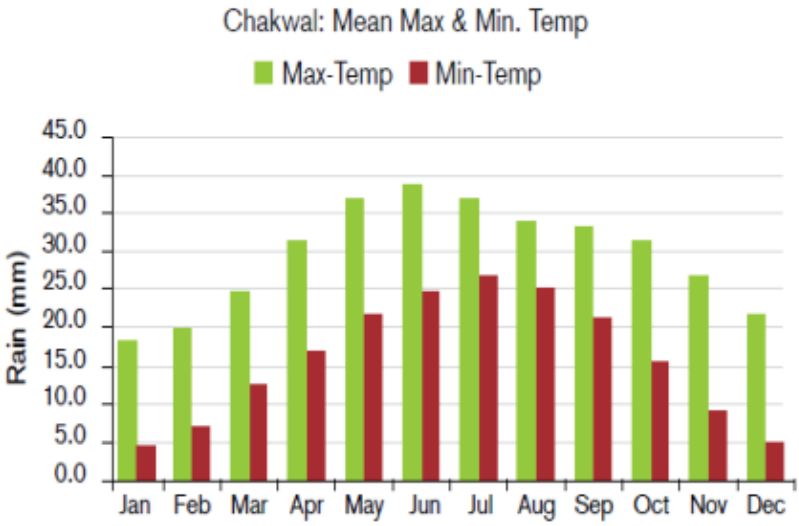


Figure 4-3 Monthly temperature of Chakwal

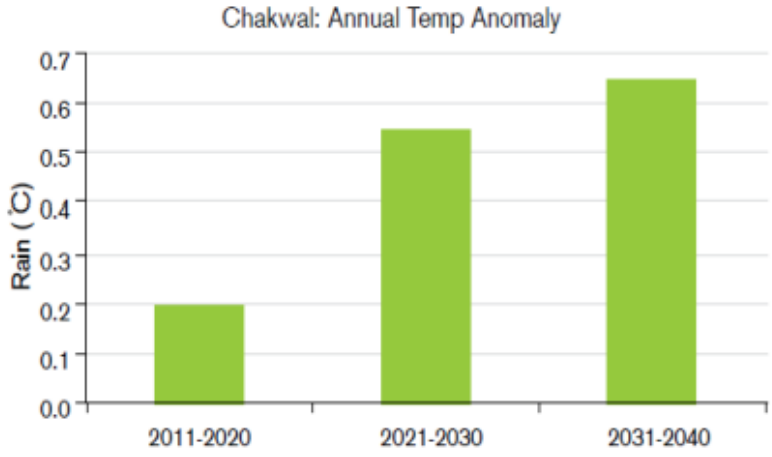


Figure 4-4 Annual temperature of Chakwal

4.1.4. Humidity

July, August and September are the most humid months in the area, whereas May and June are the least humid months. Average monthly relative humidity values at various locations in the project area are 64%.

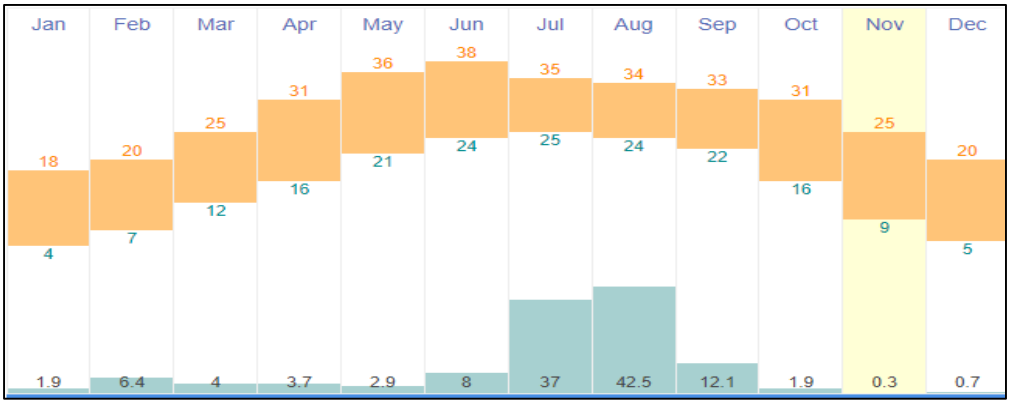


Figure 4-5 Average Humidity

4.1.5. Soils

Mostly area is covered by the mountains. Fertile land is rare in the study area. Small patches of the soil are present that are used by the house hold for the vegetable harvesting. Hard rocks are present all over the upper layer. Clay is also present at about 1-3 km distance from the proposed mining site. The soils are medium textured with considerable amount of clay materials. Soil formation of that area is occurred through the mechanical weather of the old alluvial deposit and loess due to the wind and water of the rains.

4.1.6. Climate

The meteorological data of the proposed study area was collected from the Pakistan Department of Meteorology (PMD) for the last 15 years. The climate of the area can be classified as true semi-arid, sub-tropical with long winter and sub-humid. The general feature are high June- July temperature with occasional hot, dry wind and dust storms, cold nights in winter and two rainy seasons. Unseasonal rain fall is also occur in the start of the winter Rain fall pattern of the study area are as; 3. Mid Jun to mid September 4. December to March The wind mostly flow from the north to the south in the study are region. Mean annual maximum temperature of the study area reach 29°C and

minimum is about 14°C. Humidity of the area is high at night except of the month of the May and Jun when it is about 58% at midnight and 46% at 0300 hrs. During the other month the humidity rage is about 70% to 80% while the midday humidity is low and range is 23%-26%.

4.1.7. Seismicity of the Project Area

According to seismic zoning of Pakistan the project area lies in seismic zone 2Band represents minor damage. Earthquake with high intensity for a fundamental period of more than 1 second may cause damage to

infrastructure. Seismic zoning map of Pakistan is given in figure 5-6.

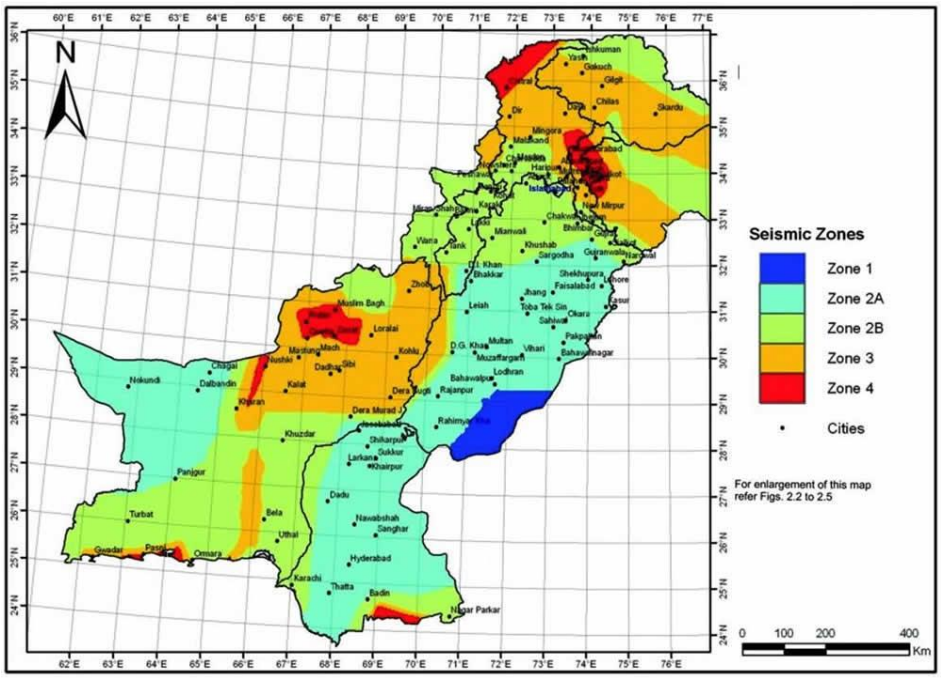


Figure 4-6Seismic zoning map of Pakistan

There are three main faults in the Salt Range:

- Kalabagh Fault (North South)
- Jhelum Fault (North South)
- Salt range thrust fault (East-West)

In the Region of Salt Range over all earthquake occurrence frequency trend is same and area representing the moderate seismicity.

4.1.8. Geography

The district is located between 33°40′38″N and 72°51′21″E. Chakwal district borders the districts of Rawalpindi and Attock in the north, Jhelum in the east, Khushab in the south and Mianwali in the west. The total area of Chakwal district is 6,609 square kilometers, which is equivalent to 1,652,443 acres (6,687.20 km^2). The southern portion runs up into the Salt Range, and includes the Chail peak, 3,701 feet (1,128 m) above the sea, and the highest point in the district. Between this and the Sohan river, which follows more or less the northern boundary, the country consists of what was once a fairly level plain, sloping down from 2,000 feet (610 m) at the foot of the hills to 1,400 feet (430 m) in the neighborhood of the Sohan; the surface is now much cut up by ravines and is very difficult to travel over.

- **Water Quality**

The Laboratory collected the underground water sample on the 06-06-2015 from the different villages for the water quality analysis of the study area. Water table of the study area is about 400 ft to 550 ft (Source local people during survey of villages).

Water typically is not considered desirable for drinking if the quantity of dissolved minerals exceeds 1,000 mg/L (milligrams per liter). Water with a few thousand mg/L of dissolved minerals is classed as slightly saline, but it is sometimes used in areas where less-mineralized water is not available. Water from some wells and springs contains very large concentrations of dissolved minerals and cannot be tolerated by humans and other animals or plants. Many parts of the Nation are underlain at depth by highly saline ground water that has only very limited uses.

Dissolved mineral constituents can be hazardous to animals or plants in large concentrations; for example, too much sodium in the water may be harmful to people who have heart trouble. Boron is a mineral that is good for plants in small amounts, but is toxic to some plants in only slightly larger concentrations

- **Groundwater**

Ground water resources are found hidden and camouflaged into the surface of earth in the form of mobile and immobile state and exist as shallow and deep wells, confined and un-confined aquifers, springs and watersheds. Ground resourced waters are not easily susceptible to natural and anthropogenic derived contamination caused by Chemical/Biological pollution and thus is directly used for sensitive applications such as drinking even it is un-treated. The project area lies in the district of Chakwal; the groundwater table normally exists approximately 5 feet to more than 20 feet below the GSL.

- **Springs water**

Study area contains two main water bodies which are natural springs named Neelwan and Abbe-shafa. Local people use the drinking water from those sources. Currently there is no pipeline system or water supply is present in the proposed study. Water is good quality of both the springs.

4.2. Baseline Ecological Environment

4.2.1. Fisheries

The project area is almost free from any commercial fishing activity. There are no lakes, natural water springs are present at 4 km distant from the proposed project site. These springs have no fish. Therefore, Fishery or any worth mentioning aquatic biology in this area is out of question.

4.2.2. Biodiversity

Natural capital of a country mainly includes all of the country's wilderness areas and scenic landscapes, including also with their associated flora and fauna. Pakistan has a total of nine major ecological zones. The contribution of the "Natural Capital" is recognized at three distinct levels: species, genera, and communities (habitat and ecosystem) both collectively and within each level, the range or variety of the resources are referred to as the "Biological Diversity". The term has relevance for each of Pakistan's administrative units district, province, and particularly country. The more the number of species, genera, and habitats and ecosystems present within these units, the greater is said to be the Biodiversity. The biodiversity of the area, with this background, is discussed as under.

4.2.3. Flora

There is a very wide range of plant species in the study area. But proposed project site have very low vegetation and plants species. Following species are most commonly found in the study are of four villages. Amongst plants, the species which are most abundant in the Study area are Kau (Olea cuspidata), Phulai(Acacia modesta), Sanatha (Dodones viscosa), Gurgura (Monotheca buxifolia), and Pataki (Gymnospo Riaroyleana).

The general vegetation consists of dry deciduous scrub. The grass species which are dominant in the area are Sariala (Heteropogan contortus), Khawi (Cymbopogan jwarancusa), Mesquite (Prosopis juilfloro), and Karir (Capparis sphylla).

Figure 4-7Native species of project site

4.2.4. Fauna

The species which exist in various areas of Chakwal district are:

- **Grey partridge**–found all over the district, especially in areas, which are sparsely populated.
- **Black partridge**–found along the seasonal channels and water holes in the bellas throughout the district.
- **Chakore**– found in dry rocky areas in the district especially in the ChoaSaiden Shah area.
- **See See partridge**–found at a number places in the district in the dry rocky area especially in the Kallar Kahar mountain belt leading into subdivision Talaga.

Endangered Specie

There are no game reserves or protected lands/areas or endangered or rare species either in the area in the range of 15km from the project site.

4.2.5. Forestry

The forests which exist naturally, since Chakwal lies in the subtropical, semiarid zone, are dry deciduous scrub, consisting of the plant varieties which are typical of these kinds of forests- keeker, kau, phulai, sanatha, wild beri, gurgura

and potaki. The underbush mainly consists of saryala, khawi, mesquite and karir. In the plantations that have been carried out by the Forest Department and private farmers, apart from the naturally occurring species of trees, the sheesham, sufaida and to some extent the poplar trees have also been planted.

At present a total of 92382 acres of the district are under reserve forest and 57868 acres are under unclassed forest. The main reserve and unclassed forests in the district are at Diljabbah, Surullah, Drangan, Gandala, Khokhar Bala, Makhiala, Dandot, Chinji, Kot Kala, Simbli, Nurpur, Bagga, Sammarqand and Thirchak. Forests in Chakwal district are taken care of by the Chakwal Forest Division, headed by the Divisional Forest Officer who is assisted by four Sub-divisional Forest Officers. The Chakwal Forest Division is spread over an area of 150250 acres which includes 375 km roadside and 40 km rail side plantations.

4.3. Baseline Socio-economic Environment

Socio-economic and other relevant information revealed from Multiple Indicator Cluster Survey (MICS) 2007-08. One of the main objectives of Multiple Indicator Cluster Survey (MICS) was to establish credible baseline for socio-economic status at each District and Tehsil Level.

Table 4-1Summary of Socio-economic Indicators

Socio-economic Indicators	**District Chakwal**
Number of households	1,270
Number of under-5 children	710
Improved source of drinking water	96.8%
Water treatment used in the household	2.6%
Percentage of population using sanitary means of excreta disposal.	69.5%
Proper disposal of solid waste	1.9%
Literacy rate	72.2%

Percentage of children for primary school entry	67.2%
Total child labor	1.9%
Had cough for more than last three weeks	1.0%
Diagnosed with Tuberculosis during last one year	0.2%
Diagnosed with Hepatitis during last one year	0.6%
Employed	87.6%
Unemployed and seeking job	12.4%
Household Utilities	
Electricity	0.1%
Natural Gas	19.3%
Radio	53.4%
TV	71.2%
Cable TV	10.5%
Telephone	21.7%
Mobile	79.0%
Socio-economic Development	
Livestock	54.1%
Mean household size	6.0%
Govt. hospitals	37.6%

4.3.1. Quality of Life Values

- **Population**

According to the 1998 census, the population was 1083725 with 12.15% living in urban areas. The district consists of three tehsils. Figure 4-8 shows the population difference of District Chakwal between 1998 and 2017.

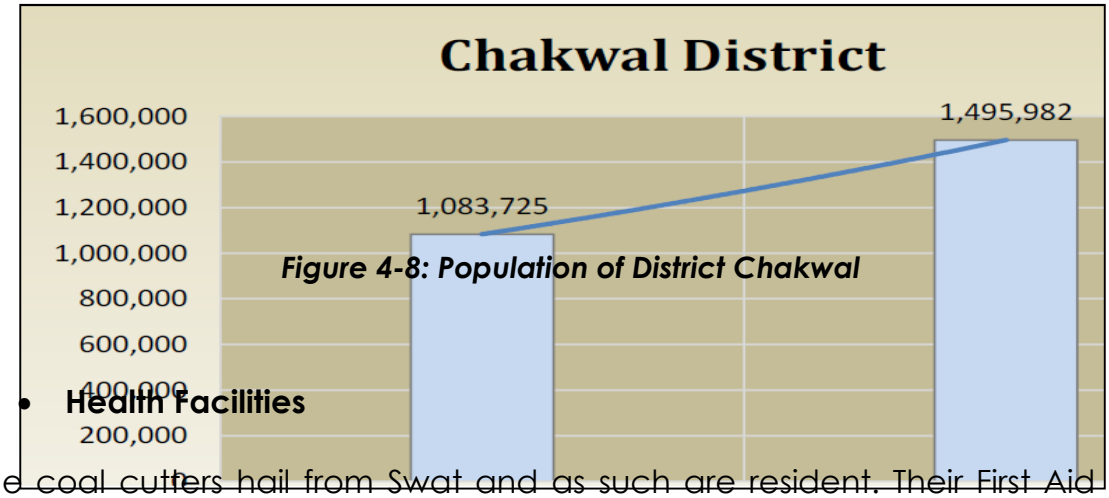


Figure 4-8: Population of District Chakwal

- **Health Facilities**

The coal cutters hail from Swat and as such are resident. Their First Aid and medical care is done by local dispensary maintained by the company. In case of health emergencies suggesting hospitalization, the patients are transferred to Mines Labor Welfare Hospital Choa Saiden Shah.

- **Education**

The primary health and education facilities are provided in the nearby town. The higher education both for boys and girls are available in Choa Saiden Shah, Kallar Kahar, Khewra and Chakwal.

- **Economic**
  - **Income Levels**

Generally, the people are poor. However, with increased job opportunities to be provided by Company; their income levels are bound to rise.

  - **Land Value**

The cultivation depends on rains; therefore, value of the land is not high.

- **Local Occupations and Employment**

Some of the locals are farmers. Many of them are employed in the mining business around as well as in the transport area. Other persons are doing labor

work in Khushab, Chakwal, Islamabad, Faisalabad, Lahore and Gujranwala etc.

Cultural Heritage

The people of Chakwal carry very plain dresses. Men usually wear shalwar kameez or Dhoti Kurta, a turban on special events with Chappals, Khusas or Sandles. In winter season they add a Sweater, Coat or a Dhussa with it. The extra educated class also wears shirts with trousers. Women almost always wear shalwar kameez with dupatta with a sweater or woolen shawl in winter. The culture of Chakwal is mainly based on the mode of living as taught in Islam, but Chakwal is the place where a large number of Hindus lived before independence of Pakistan. The people of Chakwal live a straight and simple life as emphasized by their religion.

4.4. Recreational Resources and Development:

The project area has not any private recreational facilities.

Aesthetic Values:

Like the general trend among the citizens of area, most of the people have low awareness about environment. Even then, some people take cleanliness and neatness of the environment lightly. Some people throw municipal solid wastes (MSWs) on the streets. Sense of personal responsibility to keep the environment clean as good citizens is even now lacking among a few people.

Archaeological and Historical Treasures

Archaeological or historical treasures within the project area are not available.

4.5. Lab Reports of Environmental Analysis

To assess the baseline conditions of the project area, following environmental components were monitored.

- Ambient air quality

- Noise levels and
- Drinking water quality

Lab reports are enclosed with the application.

4.6. Suitability of the Site

The site does not fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not have impacted by the construction activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of proposed project.

5. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The potential impacts due to limestone processing can be both positive (beneficial) and negative (adverse), depending on the resources and receptors involved, as well as other parameters such as geographical scope (magnitude and extent), temporal scope (duration), and reversibility. It is anticipated that this project will have positive impacts on sectors such as the local economy, employment generation, and contribution to the national revenue, among others.

Potential negative impacts are expected to be of short-term duration, limited in extent, and transient in nature, primarily related to operational activities such as transportation and fuel use. This chapter also outlines effective mitigation strategies to minimize adverse impacts and presents a monitoring plan to ensure that environmental performance is maintained throughout the project's operational life.

Impacts were characterized on the basis of following parameters:

- Nature
- Magnitude
- Extent
- Duration
- Spatial Boundaries
- Reversibility

The impacts characterization for the project has been given in Table 5-1.

Table 5-1 Characterization of Impacts

Categories	Characteristics
Nature	Direct: The environmental parameter is directly changed by the project. Indirect: The environmental parameter changes as a result of a change in another parameter.

Duration of impact	Short-term: Lasting only for the duration of the project such as noise from the construction activities. Medium-term: Lasting for a period of few months to a year the project before naturally reverting to the original condition such as loss of vegetation due to the clearing of the construction site, contamination of soil or water by fuels or oil. Long-term: Lasting for a period much greater than medium-term impact before naturally reverting to the original condition such as loss of soil due to soil erosion and air emissions.
Geographical extent	Local, regional (spatial dimension)
Reversibility of impact	Reversible: When a receptor resumes its pre-project condition. Irreversible: When a receptor does not or cannot resume its pre-project condition.
Likelihood of the impact	High: Impact expected to occur under most circumstances Moderate: Impact will probably occur under most circumstances. Low: Impact could rarely occur at some time.
Significance of impact	Categorized as Positive or Negative. Based on the consequence, likelihood, reversibility, geographical extent, and duration; the level of public concern; and conformance with legislative of statutory requirements.

Anticipated environmental impacts are discussed as;

5.1. Project location

The surrounding area is hilly and mostly barren land. The selected site is present on the belt which has abundant reserves of deposits of our concerned raw material. Moreover, there is no human settlement within the radius of the selected site and has good road infrastructure. Man power is available in the area. After environmental assessment of the study area the subject project site is most suitable to execute the project regarding the location environmental impacts.

5.2. Project Design

Processing activities will be carried out within the properly fenced project area, and only the designated operational zone will be used for limestone processing at any given time. As no mining or excavation will take place on-site, the remaining land will remain undisturbed. There will be no permanent building structures apart from the kiln and essential supporting facilities. The overall design of operations is intended to exert minimal environmental impact.

Following are the possible Environmental impacts due to Project design

- Minor alteration of soil structure in areas used for the construction of foundations and access roads.
- Increased load on local road infrastructure due to transportation of raw limestone and distribution of finished lime.
- Potential changes in rainwater runoff patterns around built-up areas, which may affect the drainage system's rainwater handling capacity.

Impact significance: low

Nature of impact: direct

Duration: NA

Timing: NA

Reversibility: NA

Likelihood: Low to Medium

Consequences: Low to Medium

Mitigation measures and recommendations

Following are the mitigation measures and recommendation to minimize the anticipated impacts.

- Proper design of fencing to secure the processing area.
- Processing layout designed for efficient material flow and safety.
- Operational activities will not be carried out in a scattered manner; work will be confined to designated zones.
- Only one specific portion of the site will be used for active processing operations at a time.
- Road infrastructure within the facility will comply with relevant laws and regulations.
- Wastewater and stormwater drainage systems will be designed with sufficient capacity to handle rainwater runoff and prevent local flooding.

5.3. Construction Stage

The impacts in relation to the construction of the limestone processing facility include those resulting from: construction of access roads, installation of the kiln and supporting infrastructure, establishment of temporary worker facilities at safe and appropriate distances, limited land clearing and leveling for foundations, and site preparation works such as surveying and material handling. The impacts resulting from these activities mainly include:

- **Dust Generation**

Dust may be generated during site preparation activities such as access road construction, land clearing, and leveling for the installation of the kiln and

associated facilities. Minor dust emissions may also occur due to the movement of machinery and vehicles delivering construction materials to the site. However, as the project site is located away from densely populated areas and vehicle movement will be limited to designated routes, the impact of dust dispersion on surrounding communities will be negligible. Additionally, access roads will be compacted and maintained to minimize dust generation, ensuring that the overall impact remains minimal.

- **Exhaust Emissions**

These emissions may result from the exhaust of vehicles and machinery operation at site. No exhaust emissions are generated due to operation of generators used for power generation as these generators operate on electricity rather than diesel.

- **Higher Noise Levels**

Higher noise levels and vibrations may be caused due to operation and movement of heavy machinery and vehicles at site and drilling if being carried out in case of hard rocks.

- **Loss of Vegetation**

Some vegetation may be lost during land clearing and leveling if it falls directly within the footprint of construction activities for the kiln, access roads, or supporting infrastructure. However, the project site is largely barren with sparse vegetation, so the overall impact on local flora is expected to be minimal.

- **Solid Waste and Wastewater Generation**

Solid waste and wastewater may be generated from construction camps and offices. It will be disposed of as per the standards of TMA.

- **Community Amenity**

Disturbance to nearby communities may occur due to dust and noise generation during construction and operational activities. Noise will primarily be associated with vehicle movement, material handling, and kiln operation. Excessive dust exposure may cause discomfort or health concerns for sensitive individuals, particularly those with respiratory conditions. As no drilling or blasting will be carried out, noise impacts will be limited. Worker accommodation, if required, will be located in a designated area within the project site to ensure safety, proper supervision, and minimal disturbance to the surroundings. All operations will comply with environmental and safety regulations, and coordination with local stakeholders will be maintained to avoid conflicts or misunderstandings.

Preventive Measures

- Controlled water sprinkling will be ensured to reduce PM_{10}.
- Maintain appropriate buffers between the site and receptors.
- Use of PPEs (face masks etc.) will be ensured by the mine operators and staff
- Use of PPEs (noise suppression equipment-ear mufflers etc.) will be ensured by the workers where noise levels are higher than 85 (dBA).
- Construction activities will be ensured at daytime when background noise levels are high.
- Vehicles speed limit will be maintained to avoid excessive vibrations.
- Regular maintenance of machinery will be ensured.
- Cutting of vegetation and trees will be avoided as far as possible.
- Afforestation will be carried out as maximum as possible.
- Solid waste will be managed efficiently. Solid waste at site will be stored in containers covered with lid.
- Waste water will be disposed of as per the standards of TMA.

5.4. Operational Stage

The potential environmental impacts resulting during operational phase of the project and their possible mitigation measures are given below.

5.4.1. Topographic/Soil

Land under consideration is mainly planed area with less undulating patches. Some area falls in the mountainous patches/topography.

Mitigation Measure

Based on the discussion above, the following measures are proposed:

- The limestone processing activities will be small-scale and continuous, with operations expected to run for an extended period based on raw material supply and market demand
- A site management and landscaping plan will be implemented to maintain the natural appearance of the surrounding area.
- Green belts, plant nurseries, or gardens will be developed within and around the facility to promote local vegetation.
- The facility will be securely fenced, with consideration given to allowing safe passage for small wildlife toward their natural habitats, away from human settlements.
- The project proponent will make every possible effort to limit the impact on local flora and fauna.

Residual Impact:

If the mitigation measures are effectively implemented and keeping in view the length of time to bring about the change in topography, the overall average impact may not be considered significant.

Impact significance: mild to high

Nature of impact: Direct

Duration: Short-to medium-term

Timing: Construction & Operation phase

Reversibility: Possible

Likelihood: Low (unlikely), as the mitigation measures will ensure that vegetation clearing is minimized

Consequences: Mild or may be positive

5.4.2. Water Resources

There are no streams or canals near the proposed site. Water requirements for the project will be fulfilled by underground water obtained through a tube well. Since no mining will take place, water will primarily be used for drinking purposes, dust suppression on internal roads, and limited process-related needs within the kiln operations. The drinking water requirement will be met from the tube well supply, with an estimated groundwater table depth of 450–500 feet at the project site. There are no formal water channels within the radius of the study area. Rainwater in the area typically flows away from the site or evaporates, and no stormwater or rainwater storage facility currently exists.

Mitigation Measures

- There is currently no stormwater or rainwater storage facility in the area. The project will construct check dams to capture and store rainwater or stormwater, which will be used for vegetation development and agricultural purposes.
- The check dams will also serve to enhance groundwater recharge by allowing stored water to percolate into the subsurface, helping stabilize the local water table.
- Water for the project will be extracted only from the deep confined aquifer.
- As the recharge rate and total available volume of this aquifer are not precisely known, groundwater extraction will be closely monitored to

ensure that it remains within sustainable limits and does not cause irreversible environmental impacts.

Residual Impact:

Post-mitigation residual impact on groundwater has been deemed acceptable if it meets the following criteria:

Nature of impact: Direct

Timing: Operation phase

Duration: Long-term; depends on the rainfall pattern and recharge regime of the deep aquifer

Reversibility: Yes

Likelihood: Moderate

Consequences: Low, as monitoring and corrective action will ensure that there is no adverse impact.

Impact significance: Low to moderate

Contamination of Soil and Water

Due to the machinery used during mining activity, raw material transportation vehicles, stored oil tanks, fuels, and other substances are the potential sources of soil contamination.

Mitigation Measures

- No deep excavation will be carried out at the proposed site.
-
- Tarpaulin sheets or containment trays will be placed under generators, compressors, fuel storage tanks, and other equipment to prevent oil or fuel seepage into the soil.
-

- Maintenance and servicing of vehicles, kiln machinery, and other equipment will be conducted only in designated maintenance areas with proper containment to avoid spillage.
- No contaminated effluents (e.g., from kiln cleaning or equipment washing) will be discharged into the environment without prior treatment.
- Sewage and domestic wastewater from staff facilities will be directed to an appropriately designed septic tank system.
- Treated effluent from septic tanks will be safely discharged into a soak pit or drainage channel in compliance with environmental guidelines.
- Septic tanks will be located at a safe distance from any existing water source to prevent contamination.
- Solid waste (including kiln residue, packaging material, and domestic waste) will be segregated at source; recyclable materials will be sent to approved vendors, and non-recyclables will be disposed of at designated municipal sites.
- Ash and kiln residue will be handled in a way that prevents dust dispersion and will be transported in covered containers for disposal or reuse where applicable.

Residual Impact:

The residual impact of project activities on the soil and water quality of the area is expected to be insignificant once the suggested mitigation measures are put into effect. The residual effects are summarized below:

Nature of impact: Indirect

Timing: Construction & Operation Phase

Duration: Medium to long term

Reversibility: Yes

Likelihood: Low, as the proposed mitigation measures will ensure that soil and water are not contaminated.

Consequences: Mild to moderate, as the effluents released into the environment will have been adequately treated

Impact significance: Low to medium, based upon low likelihood and mild to moderate consequence

Air Emissions

Air emissions from project-related activities are likely to include:

- Dust due to proposed mining activity, construction and operation of the proposed project.
- Dust raised on dirt tracks by project-related vehicles.
- Dust from drilling of deep holes.
- Combustion products from vehicles used for project-related activities

Gaseous Emissions:

Exhaust Fumes from Vehicles and Construction Machinery:

Emissions produced by vehicles and equipment will be similar to those produced by diesel generators in terms of the resulting pollutants (SO2, NOX, PM, etc.). However, the extent to which they are produced will be considerably lower, since much smaller diesel engines are used in vehicles and construction machinery.

Mitigation Measures

None of the potential effects discussed above are expected to exceed acceptable limits. The mitigation measures given below will further reduce their impact, and ensure that they remain within acceptable limits.

- Water sprinkling on the site will minimize the dust pollution.

- All equipment, generators, and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.
- Vehicle speed will be reduced on track passing through or close to settlements.
- Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic.
- Water will be sprinkled where necessary to contain dust emissions.
- All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.

Residual Impact:

After implementing the mitigation measures listed above, the residual impact of the proposed activities on ambient air quality is expected to be insignificant, as shown below:

Nature of impact: Direct

Duration: Short term

Timing: construction & operation

Reversibility: Not applicable

Likelihood: Low (unlikely) as mitigation measures will ensure that air pollution remains within acceptable limits.

Consequences: Moderate

Impact significance: Low, based upon low likelihood and mild to moderate consequence.

5.4.3. Soil and Groundwater Contamination

As discussed earlier, limestone is not stored at the project site in open piles for extended periods. It is transported directly to the kiln for processing, minimizing the chance of dust accumulation, runoff, or leaching. Therefore, the risk of soil or groundwater contamination from raw limestone storage is negligible.

5.4.4. Mine Workers Health and Safety

Project involves safety for workers from dust, noise etc.

- **Preventive Measures**

The employment of workers will be regulated in accordance with applicable Labor Laws. Worker safety and health will be ensured through compliance with relevant occupational safety regulations, including the Factories Act and its subordinate rules. The lime processing plant will be operated under the supervision of qualified technical staff, ensuring that all operations are carried out in accordance with legal requirements and established Standard Operating Procedures (SOPs).

Supervision and inspection of the plant will be carried out by the regulatory staff appointed under the relevant provincial industries and labor departments. Medical and safety staff will monitor sanitation, workplace hygiene, and health protection measures for all workers at the lime processing facility, ensuring compliance with applicable occupational health and safety standards.

5.4.4.1.Provision of First Aid Facility

At the workplace, workers and employers have adequate information, knowledge, and training regarding first aid treatment in case of any emergency. The management, in coordination with local health authorities and medical professionals, organizes refresher courses on First Aid and workplace safety. Employees actively participate in these sessions to ensure preparedness for potential incidents during limestone processing operations.

5.4.4.2.Safety Trainings

Workers and all staff are provided with proper training on operational procedures, equipment handling, and workplace safety practices specific to lime kiln and limestone processing operations. Regular training sessions are organized by the relevant provincial labour and industrial safety departments, as well as the Pakistan Lime Manufacturers Association. The company ensures that its employees attend these training programs, subject to available seats, to enhance their technical skills and safety awareness.

5.4.4.3.Use of Drugs and Narcotics

Drugs and narcotics are strictly prohibited. Smoking will be only allowed in rest timings at properly isolated places.

5.4.4.4.Provision of Personal Protective Equipment

To control any health and safety risk and to reduce the magnitude of any adverse impact, the workers are required by law to have the PPEs such as safety helmet, safety googles, rubber gloves, long shoes, safety lamps/torches etc. The company will provide the requisite PPE to its employees where required.

5.4.5. Emergency Response Plan (ERP) for Accidents/Collapse

ERP is prepared for mines to act in emergency situations. Following are some of the objectives to ERP:

- To provide an effective response to emergency situations.
- To develop responsibility levels and support coordination.
- To minimize the effect of emergencies on personnel, on the surrounding communities, and on the public.
- To minimize injury; damage to environment; property damage; damage to equipment; and losses to process that result from emergencies.

- To ensure timely communication and cooperation with government and outside agencies.
- To provide suitable information to be conveyed to the public.
- To define the Emergency Response Team as the combination of: site personnel in the area of the emergency, personnel from other areas, Mine Rescue Team, and other off site emergency personnel as needed.

5.4.6. Climate Change

Limekiln operations themselves do not directly contribute to climate change from raw material extraction, as limestone is sourced from Hassan Abdal and no mining is carried out on-site.

5.5. Summary of Potential Impacts

The summary of the positive and the negative impacts observed on the environment on the project area has been summarized in Table 7-1. The impacts have been given magnitude based on the scaling given below.

Table 5-2Scale Range

Scale Range	**0 to 5**
Major Impact	5
Moderate	4
Intermediate	3
Minor	2
Low	1
No Impact	0

Positive impacts are given (+) sign while (-) sign is used for negative impacts. The mitigation measures will be explained after a short while. The magnitude of positive and negative impacts is given in Table 7-2.

Table 5-3 Environmental Screening Matrix

Description	Physical			Biological		Socioeconomic		
	Soil Contamination	Air Quality	Water Quality	Flora	Fauna	Noise	Land Acquisition and Compensation Issues	Safety Hazard, Public Health
Land Acquisition	N	N	N	N	N	N	N	N
Contractor Mobilization	0	-1	0	N	0	-1	N	-1
Construction Camp Establishment	-1	-1	-1	-1	-1	-2	N	-1
Construction Camp Operation	-1	-1	-1	-1	-1	-1	N	-1
Site Preparation	-2	-1	-1	-1	-1	-1	N	-1
Exploration	-2	-2	-1	-1	-1	-2	N	-2
Laying of Services	-1	-1	-1	-1	-1	-1	N	-2

Exploration Materials Supply	-1	-1	N	0	0	-1	N	-1
Transportation	0	-1	N	0	0	-1	N	-1
Solid Waste Disposal	-2	-1	-2	-1	-1	-1	N	-1
Waste Effluent Disposal	-1	-1	-1	-1	-1	0	N	-1

Key: -2: High negative impact; -1: Low negative impact; 0: insignificant/negligible negative; +1: low positive impact; +2; High positive impact,

N: no Impact

5.6. Potential Environmental Enhancement Measures

- All vehicles used for transporting limestone from Hassan Abdal to the limekiln site and for lime dispatch will be regularly inspected and maintained.
- Limestone will be transported to the limekiln and quicklime will be dispatched to market in accordance with proper handling and management practices.
- Vegetative buffers around the limekiln site will be maintained regularly to keep them in good condition and to help reduce dust dispersion.
- The workforce will be trained to use personal protective equipment (PPE) to avoid any accidents or near misses at the site.
- Vehicles used for transporting limestone and quicklime will be properly designed, covered, and cleaned to avoid dust emissions or spillage during transit.
- Extensive plantation will be carried out in and around the project site to enhance environmental quality and act as a dust barrier.
- The Environmental Management and Monitoring Plan (EMMP) will be strictly implemented throughout the project life. All monitored environmental data will be reported to the EPA Punjab, Lahore for review and compliance verification.

6. ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAM

6.1. Introduction

This section presents the environmental management plan (EMP) for the proposed project. The EMP specifies the mitigation and management measures which the Proponent will undertake and shows how the Project will mobilize organizational capacity and resources to implement these measures.

The EMP covers information on the management and mitigation measures that will be taken into consideration to address impacts in respect of the operational phase of project.

6.2. Objectives

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the IEE.
- Define the responsibilities of the HSE manager of proposed project.
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures.
- Ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

6.3. Schedule of Implementation of EMMP

The implementation of EMMP should be carefully coordinated with the design and operational program of the project. This will ensure the implementation of relevant mitigation measures at the appropriate project stages. It will also ensure that adequate resources are properly allocated to achieve the desired results. This EMMP has been prepared to satisfy the requirement of "IEE and EIA Regulations, 2000".

6.4. Environmental Management Team along with their roles and Responsibilities

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

Roles and Responsibilities:

Environmental Management should become an integral part of policy of proposed project. Therefore, committing to reduce the environmental impacts will reflect the management approach and believe that good performance in this area is synonymous with running well managed efficient proposed project operation. During the construction main responsibility of environmental performance will be followed by the EHS Officer on daily basis.

In case of normal operational phase, main responsibility for environmental performance will be supervised by the site manager while daily management will be performed under the site officer who in turn charges of environmental matters. Under their surveillance, environmental management during operations will be performed as per mitigation and monitoring plans outlined in this IEE. A brief role and responsibilities is given below;

- **Top Management**

Environmental management plan will regulate by the top management of proposed incinerator plant; therefore, they will play an important role. Some of the key roles and responsibilities are given below;

- To cooperate and consult with relevant environmental agency in order to perform in better way.
- To evaluate the progress of development and implementation of this management plan.
- To approve any change in decision making with the consultation of respective managers, if appropriate.

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project
- Environmental Engineer

- **Project Manager**

The role of project manager is very important. The success of an EMP will mainly depend upon effective management of the EMP by project manager. Some of the key roles and responsibilities given to project manager are given below;

- Ensure that contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment.
- Ensure that all stipulations within the EMP are communicated and adhered to by the contractor.

- Monitor the implementation of EMP throughout the project by means of site inspections and meetings.
- Be fully aware of the environmental assessment of the project, the conditions of approval of IEE and all relevant legislations.
- To monitor the progress of development and implementation of this management plan.
- To improve coordination and exchange of communication between higher management and staff.

- **Contractor for Construction and Operation**

On behalf of contractor, the main responsibilities of all matters pertaining to environment will be that of chief of the assigned contractor. Following are the roles and responsibilities of contractor.

- To carry out constructional and operational activities in an environment friendly manner.
- Shall propose measures to minimize environmental impacts during constructional and operational phase and submit to environmental officer.
- In case of having impacts on the environment, the contractor will inform to project manager in time to get instructions and to take next step.
- Comply with the environmental management specifications.
- Maintain a public complaint register.
- Submitting a report at each site meeting which will document incidents that have occurred during the period before the site meeting.

6.5. Proposed Monitoring Program to assess performance or output of EMP

Following aspects need to be monitored regarding the subject project during pre-construction, during construction and post construction.

- Air quality
- Water quality
- Noise level
- Management of utility services including water supply, sewerage disposal, electric supply and solid wastes.

Table 6-1Environmental Monitoring Plan

Environmental Component	Frequency	Responsibility
Construction Phase		
Air Quality	Quarterly basis	Proponent
Noise Levels	Quarterly basis	Proponent
Water Quality	Quarterly basis	Proponent
Operational Phase		
Air Quality	Quarterly basis	Proponent
Noise Quality	Quarterly basis	Proponent
Wastewater Quality	Bi-annually	Proponent
Drinking water Quality	Quarterly	Proponent

6.6. Environmental Budget

The environmental budget of the project has been given in Table 8-2.

Table 6-2 Environmental Budget Breakdown

Sr. No.	Item/Activity		Quantity (No.s)	Budget (PKR)	Description
1.	Plantation Campaign		100	20,000/-	Cost includes plantation and maintenance up to 5 years
2.	Environmental Monitoring	Air Quality Monitoring	01	15,000	01 sample @ 10,000/- per sample
		Noise Level Monitoring	02	15,000	02 samples @ 7,500/- per sample
		Drinking Water Quality Monitoring	01	10,000/-	01 sample @ 10,000/- per sample
3.	Miscellaneous			40,000/-	Lump sum
Total Environmental and Social Management Cost				100,000/-	

6.7. Environmental Management Plan

Table 6-3: EMP for Construction Phase

Potential Negative Impacts	Recommended Mitigation Measures	Monitoring responsibility	Parameters For Monitoring
Dust emissions	On exposed construction surface during windy periods fugitive dust generation will be	Proponent/ contractor	Air quality

	suppressed by spraying water.		
	The construction material will be covered with polyethylene sheets to prevent dust emissions.		
Soil Erosion	Exposed surface will be resurfaced and stabilized as soon as possible.	Proponent/ contractor	Soil
Solid Waste Generation	Solid waste may include waste/unused construction materials, which should be disposed of properly.	Proponent/ contractor	Solid waste management
Vehicular Traffic And Noise	Vehicles and other noisy equipment will be kept in good conditions and their regular maintenance will be done.	Proponent/ contractor	Noise level
	Noisy construction activities will be carried out only during normal working hours.		
Health And Safety of Work Force	The contractor will ensure that the workers are trained in safety procedures for all	Proponent/ contractor	Health and safety

	relevant aspects of construction.		
	Regular checks will be made to ensure that the contractor is following safety procedures/safety measures.		
	Formal emergency procedures will be developed for construction site in case of an accident.		
	First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contacted in case of any accident.		
	Produced during construction phase will be collected by vehicle for dispose of it at a particular dumping site of the industrial estate from it will be reused. Waste segregation units will be provided. Recyclable items		

	will be provided to recycling contractors		
Water Supply	Water use will be planned depending upon the supply and timing to avoid and inconvenience.	Proponent/ contractor	Water supply
	Water conservation practices will be adopted.		
Surface and Groundwater	At project site, the septic tank will be installed safely disposal of wastewater into the nearby drain. The storage of lubricant materials such as oil and grease will be confined to a specific area so that in case of any leakage or spillage, the lubricant materials do not contaminate the entire project site.	Proponent/ contractor	Surface and groundwater

Table 6-4 EMP for Operational Phase Impacts

Potential Negative Impacts	**Recommended Mitigation Measures**	**Monitoring Responsibility**	**Parameters for Monitoring**

Dust emissions	In operational phase, dust generation by vehicles will be suppressed by spraying water. Scrubbers will be used to control dust emissions	Proponent	Air quality
Noise	Use of PPEs (noise suppression equipment-ear mufflers etc.) will be ensured by the workers where noise levels are higher than 85 (dBA). Mining activities will be ensured at daytime when background noise levels are high. Vehicles speed limit will be maintained to avoid excessive vibrations. Regular maintenance of machinery will be ensured.	Proponent	Noise
Waste water	Water conservation practices will be used. Water use will be planned depending upon the supply and timing to avoid and inconvenience	Proponent	Wastewater management

Flora and fauna	The unit includes a plan of the green yard area which is a positive impact on the flora and fauna. There is no significant fauna in that area. However, it is suggested that maximum number of trees should be planted by the management inside and outside the boundary wall in order to enhance aesthetics of the area.	Proponent	Biodiversity
Social impacts	During the operation stage, there will be no social issue for the nearby localities. Moreover, the residents may get opportunities to work in the refining unit which is a major positive impact of the project.	Proponent	Social impacts
Occupational health and safety	There may be occupational health and safety risks associated with different operational activities. Health risks may occur in case of unsafe and/or unfavorable work conditions The mitigation measures include:	Proponent	Health & safety

	The workers should get trained in safety procedures for all relevant aspects of processes. Enforcement of work safety measures. Formal emergency procedures will be developed for the segregation hall in case of any accident. First aid kits and other personal protective equipment (safety gloves, goggles, welding shields etc.) Should be kept available.		

6.8. Proposed EMP Reporting and Reviewing Procedures

6.8.1. Aim

In the context of Limekiln mining, the monitoring and evaluation is carried out to achieve following objectives:

- To access whether the project site is being managed in a sustainable manner as planned or certain bottlenecks are experienced both qualitatively and quantitatively.

- To ensure compliance of environmental parameters (i.e. ambient air and noise, water quality) with PEQS.
- To ensure the implementation of mitigation measures for overall conservation of environment at the project site.
- To undertake effective environmental surveillance of the site.
- To assess effectiveness of mitigation measures and potential environmental enhanced measures.
- To ensure compliance with national environmental obligations.
- To monitor rehabilitation of recovered land including afforestation.

6.8.2. Environment, Health &Safety Policies

6.8.2.1.Environment Policy

The environment policy right from initiation of project installation to its proper operations will be based on:

- Compliance of applicable regulatory requirements;
- Conservation of natural resources;
- Assurance of sustainable development;
- Maintaining a safe working environment;
- Providing high environmental expertise and know-how; and
- Regular training and refresher courses to achieve continuous improvement of environment.

6.8.2.2.Health & Safety Policy

The proponent identifies safety and health of the personnel as integral part of every work aspect at every level. In addition to compliance with the statutory rules and regulations as the minimum acceptable, the proponent will set nationally acceptable standards for practice and will intend to achieve the above by the following:

- Provide adequate and continuous training to all personnel;
- Prepare an over-all safety & health manual giving general requirements of leadership, planned inspections, job analysis & procedures, emergency preparedness, organizational rules, necessity and use of protective equipment, health control, etc.;
- Systematic evaluation & measurement of system performance at all operational levels and continuously update the over-all safety & health manual;
- Carrying out regular publicity campaigns effective personnel safety and health conscious; and
- To employ a person as in-charge for planning, training & safety and make him responsible for implementation of safety and health policy.

6.9. Training Needs

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged. It will be imparted by a team of experienced trainers.

7. INVOLVEMENT OF STAKEHOLDER'S / PUBLIC CONSULTATION

7.1. Introduction

Stakeholder's consultation is a tool used for communication with a diverse group of stakeholders having multifarious aims such as information dissemination, exchanging views, soliciting feedback and suggestions on issues pertaining to the project, plan future actions. This practice initiates a need assessment and identifies areas of concern for all the parties that maybe affected by the project activities.

Stakeholders by definition are all those people and institutions who have an interest in the successful design, implementation and sustainability of the project. This includes those positively and negatively affected by the project.

7.2. Benefits and Objectives of Stakeholder's Consultation

Consultation with stakeholders leads to an overall better understanding of the project on the part of the communities and gives the Proponent a clearer understanding of the stakeholders' perspective. Effective public consultation can add substantial value to the IEE study process. The information gained through public consultation on the stakeholders' concerns, interests, and their ability to influence decision-making helps identify key cause of environmental problems.

This can be used to evaluate direct and indirect environmental impacts and assess short term and long-term resource use implications. The input from local communities and NGOs can help evaluate alternatives and strengthen the management planning by incorporating local input and know-how.

An informed public will better understand the tradeoffs between project benefits and disadvantages; be able to contribute meaningfully to the project design;

and have greater trust with the project Proponent and support for the project, says the Asian Development Bank. These factors contribute towards improved project implementation sensitized to the human environment of the area. The objectives of stakeholders' consultation are to:

- Promote better understanding of the proposed operation through explaining its objectives and its potential positive and negative impacts.
- Identify and address concerns of all interested and affected stakeholders.
- Provide a mechanism to resolve issues identified by communities, before project plans are finalized and development begins, thereby, avoiding public outcry and resentment.
- Instill trust between various stakeholders and the Proponent to promote cooperation.

7.3. Identification and Classification of Stakeholders

During the field survey, significant efforts were made to identify the possible categories of stakeholders and their stakes. Identification of stakeholders is important for the sustainability of a developmental project and helps to evaluate and envisage the role of stakeholders. The influence or impact of the project on stakeholders can be elaborated in the form of a matrix and the mitigation measures are proposed accordingly. All the stakeholders had different types of stakes according to their professions.

7.4. Methodology for Consultation

Stakeholder consultation is a two-way flow of information and dialogue between the project Proponent and stakeholders, specifically aimed at developing ideas that can help shape project design, resolve conflicts at an early stage assist in implementing solutions and monitor ongoing activities.

Various techniques are used worldwide to carry out the stakeholder consultation that includes discussions, meetings and field visits. A series of scoping sessions and formal focus group discussions were carried out with environmental experts and individuals. The meetings were held at various locations.

7.5. Key Consulted Stakeholders

The stakeholders consulted in this case are public as well as environmental experts and individuals working in profession of environment. The list of stakeholders consulted and their feedback is given below.

The organizations consulted are as under:

- Chief Inspectorate of Mines Punjab its related field office
- DG Mines and Minerals Punjab, its related field office
- Representative of the Forest Department of the area
- Surface Landowners
- Nearby Village Numberdar
- Mines Labor Welfare Commissioner
- Civil Defence Officer

Each department was contacted to seek wisdom during an interaction of 4-6 man-hours each.

7.5.1. Responsible Authority

The proponent is the responsible authority to take all measures prior to the mining activity.

7.5.2. Other departments and agencies

For the impact analysis detailed meetings of local community, education institutes, health institutes, hospital and NGOs were held with the management. Issues were discussed that may affect the environment and also the

implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

7.5.3. Environmental Practitioners and Experts Team

Experts visited the project site, had discussions with stakeholders and consulted with the local people of nearby and other villages to evaluate the project socio-economic impacts. People of the area belong to different professions like mostly belong to employment, own businesses, doctors, some in abroad, in Army, teaching, in agriculture, etc. Women were also consulted for their point of view regarding the betterment of the area by this project, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

7.5.4. Affected & Wider Community

There is no affected community present in the radius of our study area. The team has consulted with the inhabitants of the different villages. They provided positive remarks regarding the subject project and in the favor of the subject mining activity for the proposed project.

List of Individuals Consulted Along with their Written Feedback

Sr.	Names/ Person consulted	Remarks
1.	DO Local Government	Mining activity should follow rules and regulation.

		No mining activity should be done without submitting environment report to EPA.
2.	Representative of EPD	Project should not cause impacts on the environment. Proper mitigations should be followed during construction and operation Phase. Proper monitoring should be done.
3.	Local Committee member	PPEs should be given to the workers. No Natural reserve will be affected by the project activity. Proper implementation of mitigation should be done. Job Opportunities will be provided to locals.
4.	Representative (Forest Department)	The proposed project should not affect any forest or within the vicinity of the forests.

7.5.5. Summary of Concerns of Consulted Stakeholders

The summary of stakes of consulted stakeholders is given below.

- The activities of the project must be studied in detail to assess all the impacts resulting from the project.
- All the environmental parameters i.e. ambient air quality, noise levels and water quality must be kept within permissible limits of PEQS.
- Project specific mitigation measures must be implemented during project's lifecycle.
- A proper Environmental Management and Monitoring Plan should be prepared to reduce adverse environmental impacts.
- Waste management must be taken into consideration (if generated during project activities).

- Management practices suggested in EMMP for solid waste should be implemented during operation of the project.
- The findings of the IEE report must be incorporated into the design and planning phase of the project.
- The IEE report should be compiled appropriately according to reporting style as suggested in Guidelines/Checklist.
- The project holds a good economic circulation. The advantages of the project seem more than its disadvantages. Therefore, the project should be operational as soon as possible.

8. CONCLUSIONS AND RECOMMENDATIONS

At the end of this IEE study, following conclusions are drawn and recommendations have been given accordingly.

Table 8-1: Conclusions and Recommendations

Conclusions	
General	• The Limekiln extraction is very crucial for meeting increased demands on national as well as international level. • All the positive and negative impacts resulting from the Limekiln mining operations have been studied in due detail on environmental settings. All the negative impacts have been given magnitude based on the defined criteria and scoring. • Mitigation measures have been suggested for each negative impact resulting from the Limekiln mining activities.
Physical Environment	• No wastewater will be generated during project activities. • The type of solid waste produced at the surface will be food waste only. The solid waste produced will consist of material excavated for mine space widening. • The food waste at the surface will be disposed of in covered containers to avoid any waste littering. • Proper mitigations may be adopted in the preliminary design including safe and environmentally friendly disposal of solid waste. • Physical impacts like soil contamination, water contamination, air pollution, high noise level, etc. are of temporary nature. However, during the operational stage by adopting abatement technologies and development of buffer zones and

	green areas intensity of negative impacts can be minimized. • All the baseline environmental parameters including ambient air and noise are well within the permissible limits of PEQS. • There are no human settlements present within the vicinity of the project site. The settlements are away from the Limekiln mines at safer distances. All the sensitive receptors are at a safer distance from the project area.
Biological Environment	• No forest area or wildlife sanctuary exists within the vicinity of the Project Area, which may be affected by the Project. Few reptiles like lizards and snakes will be disturbed by the Project activities and may have to move into nearby areas. This will be a temporary insignificant impact. Anyhow the outskirts blank area is to be covered with green trees so project site will not give barren look.
Socio-economic Environment	• The other social issues like safety of public and workers, security problems, community accessibility issue, women accessibility to fields for their daily routine life etc. will be of temporary nature. • The mining activities will provide additional job opportunities to the community of the area. The project will raise the income levels of the population of the area. • Social cohesion is optimal. • The environmental cost is negligible. • The proponent is committed to ensure eco-friendly, sustainable, safe and sound environment.
Recommendations	
General	• All measures as suggested in EMP should be adopted to minimize adverse impacts. • All appropriate environmental management &

	monitoring measures detailed in this report, together with any other environment management commitments should be implemented throughout out the entire life of the project. • Environmental Management and Monitoring Plan proposed will be implemented in the true spirit throughout the lifespan of the project. • Regular monitoring and auditing will be taken by the management to ensure the compliance of all the mitigation measures. • Environmental monitoring will be carried out by the company as suggested and communicated by EPA, Punjab.
Physical Environment	• The mining site and the road links should adopt such measures and select such machinery and their operations to minimize the dust spread. • Dust suppression machine should be available on each site for wetting of all the materials to avoid effects of dust such as respiratory diseases. • Water contamination, air pollution and high noise levels will be controlled with the use of good engineering practices. • Proper measures will be taken to control the air emission or high noise levels. • Transportation vehicles and equipment must be properly maintained and tuned well.
Biological Environment	• Extensive plantation must be carried out throughout the tenure of lease as an environmental enhancement measure.
Socio-economic Environment	• Periodic monitoring on occupational health and safety must be conducted to avoid workplace hazards. • Proponent will take due care of the local community and its sensitivity towards local customs

	and traditions. • Safety signs or boards will be placed wherever needed within the premises of the Project site. • Personal Protective Equipment (PPEs) will be provided and ensured that they are used by the workers during working hours. The workers working near the noise generating machines will be strictly required to use ear muffs/ plugs. • Fire extinguishers or firefighting equipment will be provided at well notified points to cope with fire events. • Good housekeeping will be ensured by the management. • First aid medical facility will be provided at the project site.

APPENDIX

Appendix-I: Glossary

Act means the Pakistan Environmental Protection Act, 1997.

Air pollution: The condition in which air is contaminated by foreign substances, or the substances themselves. Air pollution consists of gaseous, liquid, or solid substances that, when present in sufficient concentration, for a sufficient time, and under certain conditions, tend to interfere with human comfort, health or welfare, and cause environmental damage. Air pollution causes acid rain, ozone depletion, photochemical smog, and other such phenomena.

EIA (Environmental Impact Assessment): It is the process of identifying, predicting, evaluating and mitigating of effects of biophysical, social and other relevant proposed projects and physical activities prior to major decisions and commitments being made.

EMP (Environmental Management Plan): An EMP is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.

Environmental Impact: Possible adverse effects caused by a development, industrial, or infrastructural project or by the release of a substance in the environment.

Topography: Physical features of any area including soil, water and air are called topography.

Fauna: Word used for combination of all the species of animals.

Flora: Word used for combination of all the species of plants.

IEE (Initial Environment Examination): Initial examination of projects for identification of hazards of project.

NOC (No Objection Certificate): It is a kind of clearance issued by EPA necessary for any project to be constructed.

Particulate Matter: Minute airborne liquid or solid particles (such as dust, fume, mist, smog, smoke) that cause air pollution. Particulate matter may vary greatly in color, density, size, shape, and electrical charge, from place to place and from time to time.

PEPA (Punjab Environmental Protection Act 1997) Amended 2012: An act to provide the protection, conservation, rehabilitation and improvement of environment, for the prevention and control of pollution and promotion of sustainable development.

Appendix-II: List of Abbreviations

NOC	No Objection Certificate
EA	Environmental Approval
OHS	Occupational Health and Safety
MICS	Multiple Indicator Cluster Survey
mm	Millimeters
EPA	Environmental Protection Agency
IEE	Initial Environmental Examination
NEQS	National Environmental Quality Standards
EMP	Environmental Management Plan
EMP	Environmental Monitoring Plan
GOP	Government of Pakistan
km	Kilometer
m	Meters
NGO	Non-Governmental Organization
BDL	Below Detection Limit
SWM	Solid Waste Management
TMA	Tehsil Municipal Authority
PPC	Pakistan Penal Code
PEPA	Pakistan Environmental Protection Act
NDWQS	National Drinking Water Quality Standards
LAA	Land Acquisition Act
sq mi	Square Miles
PPE	Personal Protective Equipment
MMD	Mines and Minerals Department
CSR	Corporate Social Responsibility
M. Tons	Metric Tons

in	Inches
GLS	Ground Level Surface
MTa	Metric Tons Annually
TPD	Tons Per Day
HSE	Health Safety and Environment

Appendix-III: Source of the Data (References)

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- The Pakistan National Conservation Strategy, Environment and Urban Affairs' Division (presently-Ministry of Environment, Urban Affairs and Wild Life), Government of Pakistan, Islamabad.
- Punjab Environmental Quality Standards for Drinking Water.
- PunjabEnvironmentalQualityStandardsforMotorVehicleExhaustandNoise.
- Punjab Environmental Quality Standards for Ambient Air.
- Topographical Maps of Punjab.
- Punjab Environmental Quality Standards for Noise.
- The Canal and Drainage Act, 1873.
- The Punjab Plantation and Maintenance of Trees Act, 394.
- The Punjab Wildlife (Protection, Preservation, Conservation and Management) Act and Rules, 394.
- Information and data provided by the project proponent.
- Technical design data related to the project.
- Information gathered through discussions with the project related persons of the project proponent.
- 29."Guidelines for Self-Monitoring and Reporting by the Industry (SMART)," Final Report, March 1998, approved by PEPC, August 1999
- Mining & Environment by Prf. Bharat B. Dhar.
- Mining Environmental Handbook by Jerrold J.Marcus.

- https://mnm.punjab.gov.pk/important_minerals_occurring_in_punjab#14

Appendix IV: Terms of Reference of Environmental Reports

TERMS OF REFERENCE FOR IEE REPORT

The agreement hereinafter called Agreement, is made between M/s Punjab Environmental Consultants (Consultant) and MR. MUHAMMAD FAROOQ (Client) to prepare and carry out follow up of Environmental Study Report for obtaining Environmental approval under Section 12 of Punjab Environment Protection Act 1997 (Amended 2012) for proposed project of "Construction of Limekiln near Firm Kassar Dhudial In District Chakwal"

The client has requested the consultancy firm to provide consultancy service to prepare and follow up of IEE Report and so that client may obtain Environmental Approval from EPA, Punjab under the Section 12 of PEPA 1997 (As Amended 2012) so mutually agreed terms and conditions are as under:

NOW THEREFORE, the parties here to hereby agree as follow:

- The client shall provide assistance and access to the information contained in the feasibility study, layout plan and other project relevant documents as and when required by the consultancy firm/consultant for performance of his obligations.
- The client shall provide all available data, maps, reports, etc. about the project including but not limited to layout plan of the project. Client will provide Lab Test Reports from EPA certified lab including noise level monitoring, wastewater analysis and stack emissions report or any report/document/information demanded by the EPA.
- The client will provide to the consultancy firm with the letter of introduction and authorization and other documents as may be needed to enable consultancy firm consultant to perform the service.
- Responsible to pay all the dues of the consultants as per the agreed terms and conditions.
- The consultancy firm/consultant shall carry out the services in accordance with the provisions of the agreement including:

- Shall follow up the IEE Report and other file required with due diligence necessary/required for obtaining its approval from EPA Punjab under the statutory requirements of PEPA 1997 (amended in 2012).
- Shall give the consultancy for the preparation of the detailed Environmental Management & Monitoring Plan for enhancing the environmental conditions during installation and operational phases such as mitigation measures for wastewater, solid waste, air emissions, plantation, management of surface runoff, mitigation of socially adverse impact, if any.
- Will follow up the IEE Report and file documents considering information/documents provided by the client.
- Shall examine the entire activities and list of the details of activities likely to cause adverse impacts during and after installation phase.
- Shall suggest mitigation measures for all such activities which may cause adverse impacts.
- Will evaluate all the activities during the installation and operational phases and recommend suggestions/actions to comply with PEQS.

For and Behalf of M/s Punjab Environmental Consultants (Consultants)	For and Behalf of MR. MUHAMMAD FAROOQ (Proponent)

Appendix-VI: Consultant Team

Prime Environmental Consultant has the expertise of highly diversified experience and has completed a total of more than 150 environmental studies across Punjab. The consultant has a range of expertise available in following areas:

a) Preparation of reports, IEE report, EIA reports.
b) Preparation of Environment Management Plans
c) Assessment of Impact of mining on environment and mitigating measures.
d) Stake Holder Consultations.

Contact Details	
Consultant	Prime Environmental Consultants
Contact	(+92) 321-7860915
e-Mail	primeenvironmentalconsultants@gmail.com

The team carrying out the research project is presented in the Table:

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Ammara Afzal	Environmental Scientist M.s Environmental Science	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
2.	Zeba Haseeb	Environmental Scientist M.S Environmental Science	• Preparation of Environmental Management Plan (EMP)

			• Preparation of Environmental Monitoring Plan (EMP) • Author of IEE Report
3.	Umer Saeed	Environmental Scientist M.S Environmental Science	• Site visits

APPENDIX VIII: ENVIRONMENTAL MAP