*Environmental Impact Assessment (EIA) Report on* ***"Industrial Expansion of Cement Plant."***

**Client:** GreenStone Cement Ltd.

**Project Location:** Maharashtra, India (Semi-urban)

**Lead Consultant:** Mr. XYZ

**Date of Submission:** [xx/xx/xxxx]

**Background:** The company plans to expand its existing cement manufacturing plant in a semi-urban area of Maharashtra. The expansion includes increasing clinker production, adding new kiln lines, and extending limestone mining activities. Therefore, the EIA is needed as the expansion may increase air pollution (dust, NOx, SOx, $CO_2$) and water consumption, risk of noise pollution affecting nearby villages, and potential impacts on local biodiversity and groundwater levels.

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***Note:*** *Images are for representation only. Actual analysis and final outputs contain detailed, project-specific data, high-precision GIS mapping, and proprietary client analytics.*

# "Environmental Impact Assessment (EIA) report on Industrial Expansion – Cement Plant & Limestone Mine."



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# 1.0 Executive Summary

## 1.1 Project Overview

GreenStone Cement Ltd. proposes to expand its existing integrated cement manufacturing facility along with associated limestone mining operations located in a semi-urban region of Maharashtra, India. The expansion aims to meet increasing regional demand for cement driven by infrastructure and housing growth while improving process efficiency and environmental performance.

The proposed project involves:

- Increase in clinker production capacity through installation of an additional kiln line
- Expansion of cement grinding capacity
- Enhancement of captive power generation
- Extension of limestone mining lease area to ensure sustained raw material supply

The project falls under Category 'A' of the EIA Notification, 2006, as amended, due to expansion of clinker production capacity beyond the prescribed threshold and associated mining activities, thereby requiring prior Environmental Clearance (EC) from the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (MoEF&CC, 2006).

Existing vs. Proposed Capacity:

| Component | Existing Capacity | Proposed Expansion | Total Post-Expansion |
|---|---|---|---|
| Clinker Production | 2.5 MTPA | +1.5 MTPA | 4.0 MTPA |
| Cement Production | 3.0 MTPA | +2.0 MTPA | 5.0 MTPA |
| Limestone Mining | 4.0 MTPA | +2.5 MTPA | 6.5 MTPA |
| Captive Power Plant | 25 MW | +15 MW | 40 MW |

The project area is not located within any notified Eco-Sensitive Zone (ESZ), national park, wildlife sanctuary, or critically polluted area; however, several villages fall within the 10 km study buffer, necessitating detailed environmental and social assessment (MoEF&CC, 2020).

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## 1.2 Need for the Project

Cement manufacturing is a core sector supporting national infrastructure development. The proposed expansion is aligned with:

- National Infrastructure Pipeline (NIP)
- Housing for All initiatives
- Regional industrial growth strategies of Maharashtra

However, cement production is a resource-intensive and emission-intensive activity, with potential impacts on air quality, water resources, noise environment, land use, and ecology (IEA, 2018). Therefore, a comprehensive Environmental Impact Assessment is essential to:

- Identify and quantify potential environmental impacts
- Evaluate risks associated with mining and industrial expansion
- Develop site-specific mitigation and management measures
- Ensure compliance with applicable environmental legislation

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### 1.3 Key Environmental Baseline Findings

Baseline environmental monitoring was conducted for one full season (excluding monsoon) within the core zone (project site) and buffer zone (10 km radius) in accordance with CPCB and MoEF&CC guidelines.

**Ambient Air Quality:**

Baseline ambient air quality levels were found to be within National Ambient Air Quality Standards (NAAQS), 2009, for industrial and residential areas (CPCB, 2009).

| Parameter | Observed Range (µg/m³) | NAAQS Limit (µg/m³) |
|---|---|---|
| $PM_{10}$ | 58 – 86 | 100 |
| $PM_{2.5}$ | 28 – 44 | 60 |
| $SO_2$ | 9 – 18 | 80 |
| $NO_x$ | 14 – 32 | 80 |
| CO (mg/m³) | 0.4 – 0.9 | 2.0 |

Dust levels were higher at downwind locations, indicating influence of existing plant operations and vehicular movement, though still within permissible limits.

**Water Environment:**

- Groundwater depth ranged between 8–14 m bgl
- Groundwater quality complied with IS:10500 drinking water standards, except for hardness in localized pockets
- No perennial surface water bodies were identified within the core zone

Mining-induced stress on groundwater was identified as a key area requiring mitigation (CGWB, 2022).

**Noise Environment:**

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Noise levels near the plant boundary were observed to be marginally elevated during daytime but remained within CPCB limits for industrial areas (CPCB, 2000). Residential receptors in nearby villages showed compliance with day-night standards.

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### 1.4 Anticipated Environmental Impacts

Based on predictive modeling, engineering estimates, and risk assessment studies, the following key impacts were identified:

**Air Environment:**

- Incremental increase in particulate matter ($PM_{10}$, $PM_{2.5}$) and gaseous emissions ($NO_x$, $SO_2$)
- Increase in $CO_2$ emissions due to higher clinker production

Air dispersion modeling using AERMOD indicates that predicted ground-level concentrations (GLCs) will remain within NAAQS after mitigation (USEPA, 2019; CPCB, 2017).

**Water Resources:**

- Increased water demand for cooling, dust suppression, and domestic use
- Potential localized lowering of groundwater table due to mining activities

**Noise & Vibration:**

- Temporary increase in noise and vibration levels due to mining blasts and heavy machinery
- Possible nuisance impacts on nearby habitations if not controlled

**Land & Ecology:**

- Temporary loss of land due to mining expansion
- Disturbance to local flora and fauna, though no Schedule-I species were recorded in the study area (WII, 2016)

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### 1.5 Mitigation and Environmental Safeguards

GreenStone Cement Ltd. has committed to implementing advanced pollution control and environmental management measures, including:

**Air Pollution Control:**

- High-efficiency bag filters and Electrostatic Precipitators (ESPs) for all major emission sources
- Continuous Emission Monitoring Systems (CEMS) connected to CPCB/SPCB servers

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- Covered conveyors and storage yards for raw materials

**Water Management:**

- Adoption of Zero Liquid Discharge (ZLD) system
- Rainwater harvesting and mine pit water reuse
- No abstraction from surface water sources

**Noise & Vibration Control:**

- Controlled blasting techniques with non-electric detonators
- Acoustic enclosures for crushers and DG sets
- Green belt development as a noise barrier

**Land Reclamation & Ecology:**

- Progressive mine reclamation and backfilling
- Separate storage and reuse of topsoil
- Plantation of native species with a target green cover of ≥33% of the project area (MoEF&CC, 2018)

### 1.6 Environmental Management Plan (EMP) – Snapshot

| Component | Capital Cost (INR Crore) | Annual Recurring Cost (INR Crore) |
|---|---|---|
| Air Pollution Control | 85.0 | 6.5 |
| Water Management & ZLD | 22.0 | 3.2 |
| Green Belt & Ecology | 8.5 | 1.4 |
| Environmental Monitoring | 6.0 | 2.1 |
| CSR & CER Activities | — | 5.0 |
| Total | 121.5 | 18.2 |

### 1.7 Conclusion

The proposed expansion of GreenStone Cement Ltd.'s cement plant and limestone mine has been comprehensively assessed through this EIA study. With the implementation of recommended mitigation measures, pollution control systems, and a robust Environmental Management Plan, the project's environmental impacts are expected to remain within acceptable limits as per national standards.

The project contributes significantly to regional economic development, employment generation, and infrastructure growth while incorporating sustainable industrial practices. Therefore, the project is recommended for Environmental Clearance, subject to strict

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compliance with EMP commitments and statutory conditions (MoEF&CC, 2006; CPCB, 2017).

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# 2.0 Introduction

## 2.1 Purpose of the Environmental Impact Assessment

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