

Executive Summary	Expansion project for Silica Sand Mine with (ML area 53.75.22 Ha) production capacity from 1,50,000 MTPA to 4,50,551 MTPA at Village Kasarde, Tahsil Kankavali, District Sindhudurg, Maharashtra by Kasarde Co-operative Mining Society Limited.
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EXECUTIVE SUMMARY

1. INTRODUCTION

Kasarde Co-operative Mining Society Ltd was established on 15/12/1964 under section 9(1) of Maharashtra Co-operative Societies Act 1930 (Reg. No. R.T.G./G.N. L/309) and engaged in the business of Mining and Allied activities of crushing, washing and sales of Mineral from 1968. The villagers of Kasarde are the members of this co-operative society and 100% shareholders are from Kasarde village.

Kasarde Co-operative Mining Society Ltd, Kasarde, Maharashtra is having a Mining Lease (Silica Sand & Limestone Mine) at Kasarde Village, Kankavali Taluka, Sindhudurg District, Maharashtra State over an extent of 53.75.22 Ha. The total lease area of 53.75.22 Ha covers Non-Forest/Private waste land.

The Government of Maharashtra have executed Mining Lease Deed for Silica Sand & Limestone Minerals over an area of 53.75.22 ha at Village: Kasarde, Taluka Kankavali, District Sindhudurg on 29/10/1968 to 28/10/1988 for 20 years of period. And in between this period the question of “minerals rights” on the land in the village of Kasarde in between Inamdar Shri. A G Pitre & Government of Maharashtra our Mining activities were stopped. Further the Government of Maharashtra issued a Corrigendum No. MMN 2089/3177/84750 1 No. 9 dated 09/05/1989 and extended the said lease period up to 12/08/1994 due to loss of lease period.

As the said Mining Lease period was up to 12/08/1994 and as per section 24 of MMRD Act 1957. We had applied for renewal of said Mining Lease on 11/08/1993 for further 20 years of period. As per provisions of section 24 A (6) (Deemed Renewal) of MCR 1960 our application for renewal was within time, and since no order was passed before expiry of the lease period i.e., 12/08/1994.

Then Government of Maharashtra renewed the said Mining Lease under order No. MMN 2096/40023/7047/Desk-4 dated 25/01/2001 for 20 years of period and said Mining Lease was executed on 24/07/2001, considering the Lease period of 20 years with effect from 27/07/2001 to 23/07/2021. After the said renewal of Mining Lease Deed, we had been

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carrying on Mining Business at Village Kasarde and had been complying with terms and conditions of Mining Lease Deed.

On 19th June 2016 the District Mining Officer Sindhudurg issued an order informing us that the term of the said Mining Lease had expired on 11/08/2014 and therefore we were directed to stop Mining Activities in said Mining Lease on 28/01/2016 as we were in receipt of DMO Sindhudurg order on 27/01/2016.

We therefore immediately approached personally to the DMO Sindhudurg and submitted our say on 22/02/2016 and requested him to revoke the said order dated 19/01/2016 as the Lease is valid till 23/07/2021. So, in this arisen situation we were compelled to suspend our Mining Activities with effect from 28/01/2016 to 10/01/2019 i.e., 2 years 11 months 15 days of working period. For this loss of Period (28/01/2016 to 10/01/2019) we have approached to Hon. High Court, Mumbai vide Writ Petition No.10476 of 2017.

There after we approached the Hon' High Court, Mumbai and filed writ petition No. 104761/2017 and said Writ Petition came up for hearing before Hon 'Justice Shri Anoop V. Mohta and Shri Manish Pitale JJ. The Bench pleased to decide the petition on 20/11/2017 by awarding stay on the order dated 19/01/2016 issued by DMO Sindhudurg till disposal of The Writ petitions. Further the Hon' High Court Mumbai have specifically mentioned in their order that as per Lease Deed the Lease period to expire on 23/07/2021 Subject to terms referred therein and till this date this lease deed is in force.

As per MMDR 2015 lease period was made for 50 years from grant, so the lease period as per MMDR 2015 comes to 28/10/2018. During these 50 years, 5 years 9 months and 12 days Mines was stopped due to litigation between government and mining company. The Government of Maharashtra vide its letter No.MNG-0821/C.R.67/Ind-9b, dated 03/03/2022 and Directorate of Geology and Mining letter No.MLR-567/2022/981, dated 14/03/2022. Granted extension for 5 years 9 months and 12 days from 29.10.2018 to 12/08/2024.

The lessee has obtained renewal of Consent to operate with consent number MPCB/ROKOLHAPUR CONSENT/2005000358 on 12.05.2020.

This progressive mine closure plan is prepared under MMME (D & R) Rules, 2013 for

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further period of five years from 2022-23 to 2024-25 with vide no. STVC/446/2019-20/1500 dated 13.04.2022.

The ToR application submitted to SEIAA, Maharashtra with proposal No. SIA/MH/MIN/81796/2022. ToR was issued SIA/MH/MIN/81796/2022 dated 05.12.2022. ToR letter is enclosed as Annexure-I for the preparation of EIA/EMP report.

2. PROJECT DESCRIPTION

M/s Kasarde Co-operative Mining Society Limited proposes to Expand in production of Silica Sand Mineral from 1,50,000 MTPA to 4, 50,551 MTPA, over an extent of 53.7522 Ha, at Village Kasarde, Tahsil Kankavali, District Sindhudurg, Maharashtra. The area is marked in the survey of India Topo sheet No. 47 H/11. The Quarry lease located Latitude 16°26'00.75"N to 16°27'44.14"N and Longitude 73°41'10.72"E to 73°41'47.23"E. The highest level is 145 MSL, whereas lowest level is 110 MSL. The difference between the top MSL and bottom MSL is 35m. The slope of the lease area is towards NNE. There is a nallah flowing along the NE boundary of the lease area.

The quarry lease area is connected 34.7 km from Sindhudurg District headquarters. Nearest highway is SH-115 is 1.06 km from mine in NW direction. Kasarde village at 0.878 km in S direction from mine lease area. The lease area is well connected to the main road through all weathered road. The mine is approached by internal road which connect the lease to the highway. Nearest airport is Chhatrapati Rajaram Maharaj Airport Kolhapur located at about 68.36 km in NE direction. Achirne railway station is located at 5.20 km from the lease area in E direction.

TABLE 2-1 PROJECT SUMMARY & SALIENT FEATURES WITHIN 15KM RADIUS OF THE LEASE AREA BOUNDARY

Project Name	Expansion Project for Silica Sand Mine with (M L Area 53.7522 ha) production capacity from 150000 MTPA to 450551 MTPA at village Kasarde, Tehsil Kankavali, District Sindhudurg by M/s. Kasarde Co-operative Mining Society Ltd.
Mining Lease Area	53.7522 Hectares

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Mineral	Silica Sand
Mining Plan Approval	STC/446/2019-20/1500 dated 13th April 2022
Lease Period	Up to 12/08/2024
Location of Mine	Khasara No. 114,116, 52, 23, 51, 84, 52 and 50 Village Kasarde, Tahsil Kankavali, District Sindhudurg and Maharashtra State.
Toposheet number	47H/11
Proposed production of mine	Expansion of production of Silica Sand from 1,50,000 MTPA to 4,50,551 MTPA
Method of mining	Open cast Semi mechanized mining
Drilling/Blasting	No drilling & Blasting required
No. of working days	300 days
Water demand	9.0 KLD
Manpower	50
Nearest Railway station	Achirne Railway station – 5.20 km, from the project in E direction.
Nearest Airport	Chhatrapati Rajaram Maharaj Airport, Kolhapur 68.36 Km, NE direction
Nearest Habitation	Kasarde- 0.878 km [S]
Nearest City	Kankavali -14.20 Km, SW
Nearest Road	State Highway 115 - 1.06 km, NW
Water bodies	Piyali River – 2.5 Km, SW Devgad River - 5.0 Km, SW Mona river - 4.5 Km, SE
Reserve Forest	None, within 10 Km radius area of mine site.
Availability of water	The ground water table in the area is about 45 to 50 m.

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Social Infrastructure available:	<p>The area is part of Sindhudurg district, and is well connected to Kasarde village and Kankavali, where all basic infrastructural facilities like school, primary health center etc. are existing.</p> <p>Kasarde Madhyamik Vidyalaya and Senior College Commerce, Kasarde 1.0 km, SE direction.</p> <p>Police out post, Kasarde 3.1 Km., W direction.</p> <p>Primary Health Center, Kasarde 878 m, W Direction.</p>
Hills/Valleys	Nil
Ecologically Sensitive Zone (Wildlife Sanctuaries)	There is no National Park, Wildlife Sanctuary and Biosphere Reserve within 10 Km of Project site. So, no approval is required.
Defense Installation/ Historical Monuments/ Archaeological/ Ports	Nil
State Boundary	Maharashtra–Karnataka boundary, 62 km, E direction
Historical Places	Nil
Areas susceptible to natural hazard which could cause the project to present environmental problems (earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions) similar effects	The area is not sensitive to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions. Zone-III (Least Active)

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3. GRADE OF SILICA SAND OF THE OF THE MINE

SiO ₂	96.19%
Al ₂ O ₃	1.70%
CaO	0.39%
MgO	0.26%

Threshold value for Silica sand is 90% of SiO₂.

3.1 TOTAL GEOLOGICAL RESERVES

Summary of Geological Reserves as per UNFC Classification

Classification	Code	Quantity in Tons
Proved Minerals Reserve	111	20,26,145
Probable Mineral Reserve	121	22,90,716
Feasibility Mineral resource	211	-
Pre-feasibility mineral resource	222	-
Measured Mineral Resource	331	-
indicated Mineral Resource	332	-
Inferred Mineral Resource	333	-
Reconnaissance Mineral Resource	334	-

4. PROVED MINERAL RESERVES

Proved Mineral Reserves -111					
Section	Sec.Area m ²	Influence	B.D.	Rec %	Tonnage
A-A'	995	150	2	85%	253725
B-B'	1985	140	2	85%	472430
C-C'	1895	100	2	85%	322150
Total	4875				1048305

Probable Mineral Reserves-122					
Section	Sec.Area m ²	Influence	B.D.	Rec %	Tonnage
A-A'	2422	150	2	85%	617610
B-B'	3837	140	2	85%	913206
C-C'	1726	100	2	85%	293420
Total					1824236

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Survey No.114/116

Proved Mineral Reserves -111					
Section	Area m ²	Influence	B.D.	Rec %	Tonnage
D-D'	3152	100	2	85%	535840
E-E'	2600	100	2	85%	442000
Total					977840

Probable Mineral Reserves-122					
Section	Area m ²	Influence	B.D.	Rec %	Tonnage
D-D'	1129	100	2	85%	191930
E-E'	1615	100	2	85%	274550
Total					466480

5. METHOD OF MINING

Open Cast Mining

Existing method of excavation:

The mining is carried out by opencast semi-mechanized method. No drilling and blasting are done to loosen the stratum. Stratum is excavated by hydraulic Excavators. Tipper/dumpers are used for transport of ore/waste. Wheel loader, backhoe excavator, water tanker etc. are used for various secondary activities.

Machines and dimensions of the bench, road etc., are chosen to suit semi mechanized working. The height of the bench would be 6m and width is at least 8m for smooth movement of Excavators and dumpers. Angle of individual bench is 430 while that of pit slope angle is 280. Road width is at least 6m and gradient normally does not exceed 1 in 16. Pits are already developed.

Proposed method.

Existing method of working will be followed. Pits are already developed they will have to be widened and deepened to extract the material. Pits will be reformed while working. Separate benches will be made in overburden and waste. Overburden material will be taken temporarily stacked and will be utilized for maintenance and making of roads and ore can be extracted from the strata. All the waste material are and will be used to prepare/ maintenance of haul roads within the lease area.

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6. ULTIMATE PIT DEPTH

The Ultimate proposed depth of the pit / excavation depth is 85 mRL as per data available.

7. PROPOSED PRODUCTION

Raw material i.e., Silica sand will be produced by open cast mechanized method of mining with proposed production of 4,50,551 MTPA.

Expansion in production of Silica Sand Mine with (ML area 53.7522 Ha) production capacity from 1,50,000 MTPA to 4,50,551 MTPA.

Year	O/B waste +Asst. Waste tons	Production tons	Ratio
2022 – 2023	40185	450551	1:0.089
2023– 2024	24672	449873	1:0.054
2024–2025 up to 12.08.2024	40144	450434	1:0.089
Total	105000	1350857	1.0.077

8. DESCRIPTION OF THE ENVIRONMENT

Topography

M/s Kasarde Co-operative Mining Society Limited proposes to Expand in production of Silica Sand Mineral from 1,50,000 MTPA to 4,50,551 MTPA, over an extent of 53.7522 Ha, at Village Kasarde, Tahsil Kankavali, District Sindhudurg, Maharashtra. The area is marked in the survey of India Topo sheet No. 47 H/11. The Quarry lease located Latitude 16°26'00.75"N to 16°27'44.14"N and Longitude 73°41'10.72"E to 73°41'47.23"E. The highest level is 145 MSL, whereas lowest level is 110 MSL. The difference between the top MSL and bottom MSL is 35m. The slope of the lease area is towards NNE. There is a nallah flowing along the NE boundary of the lease area.

The quarry lease area is connected 34.7 km from Sindhudurg District headquarters. Nearest highway is SH-115 is 1.06 km from mine in NW direction. Kasarde village at 0.878 km in S direction from mine lease area. The lease area is well connected to the main road through all weathered road. The mine is approached by internal road which connect the lease to the highway. Nearest airport is Chhatrapati Rajaram Maharaj Airport Kolhapur located at about 68.36 km in NE direction. Achirne railway station is located at 5.20 km from the lease area in E

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direction.

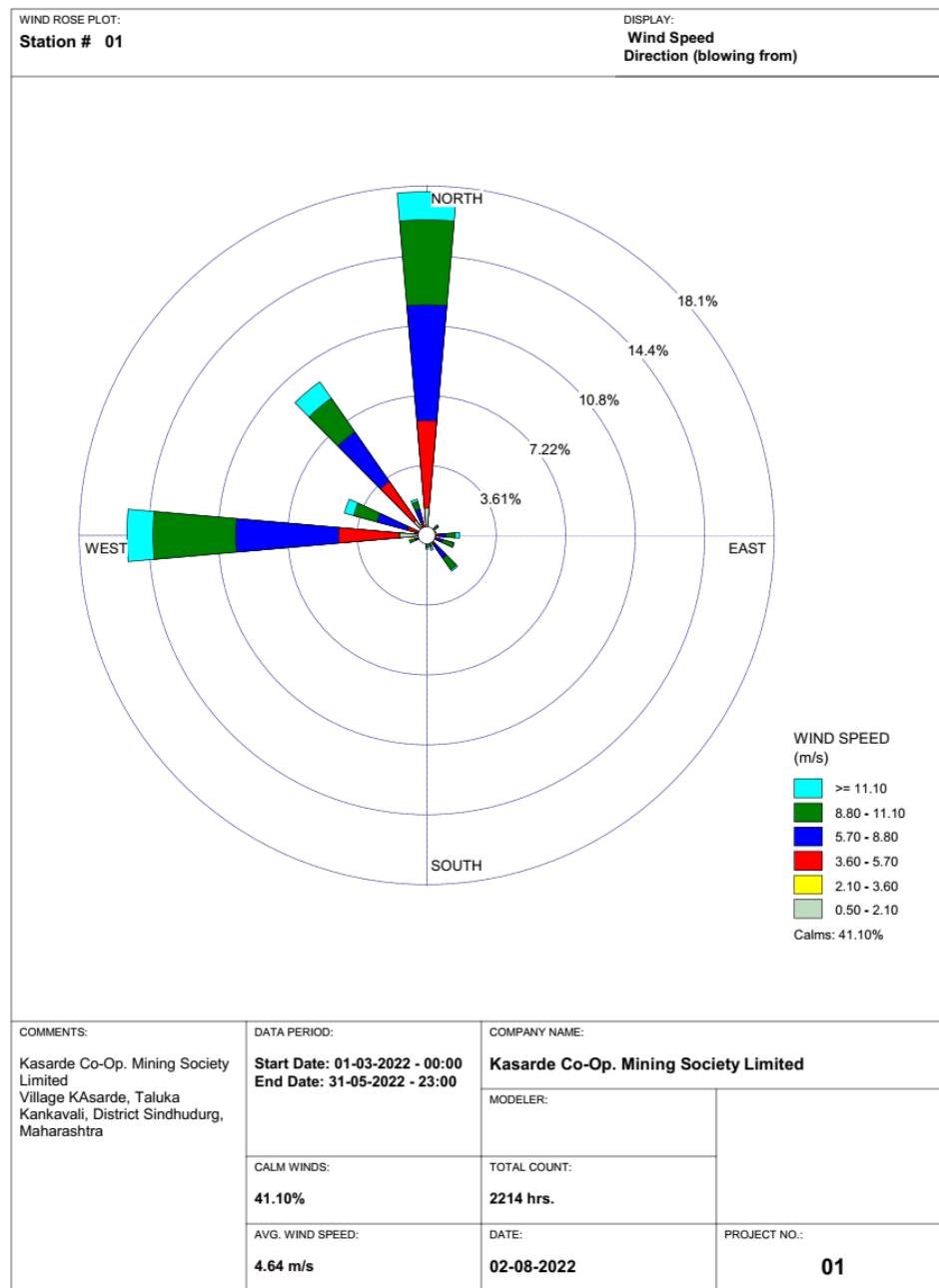
➤ METEOROLOGY

STUDY PERIOD - PRE-MONSOON SEASON (MARCH 2022 TO MAY 2022)

Date	Temperature (°C)		Relative Humidity (%)		Wind at 08:30 hrs		Wind at 17:30 hrs	
	Max.	Min.	08:30	17:30	Direction	Speed	Direction	Speed
						(km/h)		(km/h)
01-03-2022	19	33	32	75	ENE	4	NW	11
02-03-2022	19	35	27	70	E	0	NW	7
08-03-2022	22	35	35	68	NW	0	0	7
09-03-2022	30	34	49	88	0	2	NW	15
15-03-2022	22	35	22	87	E	9	0	2
16-03-2022	22	36	62	86	NW	9	0	0
22-03-2022	24	33	59	91	NW	11	0	4
23-03-2022	23	32	55	91	NW	9	0	7
29-03-2022	25	33	63	91	0	7	ESE	0
30-03-2022	25	35	62	91	WSW	0	NW	4
05-04-2022	27	31	63	86	W	0	NW	0
06-04-2022	27	34	50	86	NW	0	0	6
12-04-2022	20	33	63	76	0	0	0	0
13-04-2022	23	34	63	76	0	15	WNW	0
19-04-2022	26	35	55	84	NNW	6	W	0
20-04-2022	27	34	56	81	WNW	0	W	0
26-04-2022	25	36	60	78	0	2	0	4
27-04-2022	25	34	54	85	0	0	NW	0
03-05-2022	25	32	70	88	W	4	0	4
04-05-2022	27	33	58	88	W	6	0	9
10-05-2022	28	32	60	95	0	9	W	0
11-05-2022	28	33	60	95	0	9	NW	0
17-05-2022	22	36	60	95	SSE	9	W	0
18-05-2022	22	31	51	95	0	6	0	9
24-05-2022	29	33	51	95	W	6	NNW	4
25-05-2022	27	35	54	93	0	0	W	0

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WRPLOT View - Lakes Environmental Software

FIGURE 0-1 WINDROSE DIAGRAM PERIOD: MARCH – MAY 2022

Source: WRPLOT VIEW - Lakes Environmental Software

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Air Environment

Locations of AAQ Monitoring Stations

S. No.	Code	Name of Sampling Location	Direction (Distance) from Project Site
1	A1	Project Site	None
2	A2	Village Devalkarwadi	0.40 km., E
3	A3	Village Nandgaon	5.54 km, S
4	A4	Village Gadmath	5.5 km SE
5	A5	Village Nadhavade	6.20 km, N
6	A6	Village Tondavli	5.4 km., SSE
7	A7	Village Tarele	3.2 km., W
8	A8	Village Achirne	6.5 km, E

The monitoring was carried out for three months (March – May 2022) at a frequency of twice a week at each station adopting a continuous 24-hour schedule.

The following parameters were monitored in the study area:

Particulate Matter (PM10)	Sulphur Dioxide (SO ₂)
Particulate Matter (PM2.5)	Oxides of Nitrogen (NO _x)
• Carbon Monoxide (CO)	

➤ Noise Environment

Locations of Noise Monitoring Stations

S No.	Code	Name of Sampling Location	Direction (Distance) from Project Site
1.	N1	Project Site	None
2.	N2	Village Devalkarwadi	0.40 km., E
3.	N3	Village Nandgaon	5.54 km, S
4.	N4	Village Gadmath	5.5 km SE
5.	N5	Village Nadhavade	6.20 km, N
6.	N6	Village Tondavli	5.4 km., SSE

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S No.	Code	Name of Sampling Location	Direction (Distance) from Project Site
7.	N7	Village Tarele	3.2 km., W
8.	N8	Village Achirne	6.5 km, E

Ambient noise levels were measured at eight locations around the proposed project site.

- Noise levels vary from 37.4 to 51.7 Leq dB(A) during the daytime.
- Noise levels during the nighttime noise levels range from 36.4 to 45.1 Leq dB(A).

Thus, noise levels at all locations were observed to be within the prescribed limits. From the above study and interpretation, it can be concluded that noise levels in the study area are well within the prescribed limits as prescribed by the CPCB and State Pollution Control Board.

Water Environment

GROUND AND SURFACE WATER SAMPLING LOCATIONS

S No.	Code	Name of Sampling Location	Direction (Distance) from Project Site
Ground Water Sampling Locations			
1	GW1	Village Kasarde	0.80 km, W
2	GW2	Village Devalkarwadi	0.40 km., E
3	GW3	Village Kokisare	4.9 km, NE
4	GW4	Village Anand Nagar	3.30 km, WSW
5	GW5	Village Nadhavade	5.7 km., E
6	GW6	Village Nandgaon	5.54 km, S
Surface Water Sampling Locations			
1	SW1	SW1 (Mine Pit)	-
2	SW2	SW2 Dharan dam	3.98 km, NW
3	SW3	SW3 Piyali Nadi	2.5 km, SE

A review of the above chemical analysis reveals that there is not much variation in the chemical composition of water tapped from shallow open wells and tube wells. The groundwater from all sources remains suitable for drinking purposes as all the constituents

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are within the limits prescribed by drinking water standards promulgated by Indian Standards IS 10500. Analysis results of groundwater reveal the following:

- pH varies from 6.65 to 7.12.
- Total hardness varies from 265 mg/l to 428 mg/l
- Total Dissolved Solids varies from 284 mg/l to 452 mg/l.

All parameter values in groundwater sources are well and within the permissible limits laid by the Ministry of Health, Govt. of India, for potable water.

Summary of Surface Water Samples within 10 km Radius:

Analysis results of surface water reveal the following:

- pH varies from 7.85 to 8.12.
- Total hardness varies from 127 mg/l to 184 mg/l
- Total Dissolved Solids vary from 327mg/l to 399 mg/l.

All parameter values in surface water sources are well and within the permissible limits laid by the Ministry of Health, Govt. of India, for potable water.

➤ **Soil Environment**

Locations of Soil Sampling Stations

S. No.	Code	Name of Sampling Location	Direction (Distance) from Project Site
1	S1	Village Kasarde	0.80 km, W
2	S2	Village Devalkarwadi	0.40 km., E
3	S3	Village Kokisare	4.9 km, NE
4	S4	Village Anand Nagar	3.30 km, WSW
5	S5	Village Nadhavade	5.7 km., E
6	S6	Village Nandgaon	5.54 km, S

Soil profile and quality was studied at 06 different locations. Augur method was used and samples were collected at 15 cm depth after removing the upper crust. Sample from each spot were well mixed with hand on a clean polythene sheet. About 1 kg of soil was retained after process of quartering.

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Core Zone: Texture of soil is Silty Clay. Soil texture is one of the most important physical properties of soil that affects its fertility and productivity.

In present case soil texture clearly indicates that the soil in core zone contains high percentage of Silty clay which can hold water and nutrients and makes soil fertile. So, the trees which can grow in these conditions can be planted.

The result shows that color is Blackish, pH is 7.41. The availability of many plant nutrients in the soil changes as a result of reactions in the soil, which are largely controlled by soil ph.

Amount of primary nutrients like Organic matter (2.33%), the Total nitrogen (422 kg/ha) is sufficient in range, the Total phosphorus (359 kg/ha) is more than sufficient in range and Total potassium (167 kg/ha) less in range, the primary nutrient profile shows that soil is moderate in fertility due to the availability of the better amount of nitrogen and phosphorus however the potassium is not in adequate amounts which can stunts plant growth and reduces yield. Nitrogen is the most important fertilizer element. Plants respond quickly to the application of nitrogen. This element encourages above-ground vegetative growth and gives a deep green colour to the leaves & Potassium is the third essential fertilizer element and it is essential for photosynthesis, protein synthesis, starch formation and the translocation of sugars. So, the addition of biofertilizers will enhance the fertility of the soil.

Buffer Zone: The result shows that texture of soil is Silty Clay. Colour is Blackish, pH ranges from 6.49 to 8.52, Amount of primary nutrients like Organic matter is from 0.64 % to 1.69 %, the total nitrogen 116 kg/ha to 306 kg/ha, the total phosphorus 32.7 kg/ha to 105 kg/ha is medium to sufficient in range and total potassium 46.1 kg/ha to 225 kg/ha is less too medium in range, Primary nutrient profile shows that soil is good in fertility due to the availability of the sufficient amount of nitrogen and phosphorus with a medium amount of available potassium.

➤ **Land Use Pattern**

Remote sensing satellite imageries were collected and interpreted for the 10 km radius study area for analysing the Land use pattern of the study area. Based on the satellite data, Land use/ Land cover maps have been prepared.

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DATA USED

The LU/LC study shall be carried out for a study area of 10 km radius taking site as centre using the satellite imageries (IRS RS2 LISS IV FX) for Khariff season.

The data is used for the preparation of different maps to study the natural resources. The data is used by using the application of Remote Sensing and GIS technologies.

Land use / Land cover map is prepared by visual interpretation of high-resolution satellite data with the help of Survey of India Topographic maps on 1:50,000 scale. Two season data (Khariff year 2019) is used for the delineation of different units. The units are confirmed by the ground truth/field visits.

Level-II classification of National (Natural) Resources Information System (NRIS) has been followed for the delineation of units.

➤ **Biological Environment**

CORE ZONE

The core region is split into two halves, one of which is smaller and the other greater in size. Both the larger and smaller plots have a variety of flowers. About 16 types of shrubs and 15 species of herbs made up the primary shrub and herb vegetation in the mine lease area including 4 species of trees. The Pothos scandens, Mirocos paniculata, and Calotropis gigantea shrubs and Centella asiatica, Phyllanthus niruri, and Achyranthes aspera herbs predominate in the mine lease area. Brachiara mutica and Cyanodon dactylon are the dominant grass species in the mine lease area.

Buffer Zone

During the study period, 100 floral species were observed within a 10 km radius, including 68 trees, 16 shrubs, 15 herbs, 5 types of grass, and 2 bamboo species. According to the IUCN (Redlist, 2020), two of these species—Garcinia indica and Myristica malabarica—are Vulnerable, and one is Near Threatened, which is Aegle marmelos

Fauna of Buffer Zone: Birds are regarded as good indicators of an ecosystem's habitat health condition, and the EB field study visits in the buffer zone are primarily focused on avifauna and flora. During the brief field survey, a total of 67 bird species from 14 orders, 38 families, and 58 genera were recorded. Out of these 54 species, 10 are Resident Migratory, and 3 are Migratory Visitors.

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Eco-sensitive Zone

There is no Wildlife Sanctuary, National Park or Biosphere Reserves in the Core as well as bufferzone.

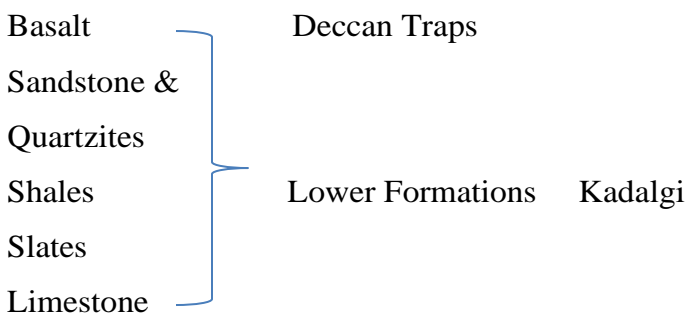
➤ **Socio-Economic Environment**

The Socioeconomic study was conducted in the study area. It was found that 45 villages fall within the 10 km radius of industrial area. As per secondary data Census 2011, the population of buffer zone is 41858. The number of households found as 10692 implying that there was average 4 members per household. The total number of literate within the study area is 30215 which are 72.18% of total population. Male literacy rate of the study area is 52.65 % and female literacy rate is 47.34%. The number of total workers in the study area is 17057 which is 40.74 % of total population. Total workers are further divided into main workers & marginal workers.

➤ **Geology & Hydrogeology of the Area**

Regional Geology

Kadalgi formations exposed in the area include sandstone of various nature and grades, shale, slate and few patches of limestone, these formations are surrounded by younger formations such as Basalt and laterites, forming inliers. Except the Wagh Dongar hill, Mahar Dongar and Salwa hill all other hills are covered by basalt and laterites. The order of super position in this area has been grouped under lower Kadalgi formations and is as follows:



The Lower Kadalgi formations are well exposed in the prominent hills of the regions namely Mahar Dongar, Wagh Dongar and Salwa hills.

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Local Geology

The sandstone occurring in this area belongs to Kadalgi series which are well exposed in the existing pits in the area and also on the Mahar Dongar hill adjacent to the area. In the lease area, clear cut exposures of sandstone are not seen on the surfaces but sandstone float in laterite soil and structural features of the exposures on adjacent hill indicates the presence of sandstone in the area. These sandstones are covered by laterites and lateritic soil on an average up to 0.5 m depth from the ground level. This is confirmed by pit logging of the existing pits.

The area exposes only laterite and sandstone as geological formations or lithological units. The Sandstone in the area shows different characters and color variations. The contact of kaladgis to Deccan traps maybe inferred. Foundry grade sandstone and off-white sandstones are exposed of various places in the pits.

9. ALTERNATIVE SITE AND TECHNOLOGY

The lease has already been executed on the basis of mineral availability and mining plan has been prepared and approved to excavate the mineral therefore any change in site or technology is not envisaged.

10. ENVIRONMENTAL MONITORING PROGRAMME

Post project monitoring shall be done and the recorded data will be submitted half yearly by project proponent to MoEF& CC (Regional Office) and State Pollution Control Board (SPCB). Following parameters shall be monitored.

- Ambient Air Quality
- Noise
- Surface & Ground Water
- Soil
- Plantation and Greenbelt

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- Occupational Health and Safety

➤ **Environmental Monitoring Schedule**

Environmental monitoring at various locations, within the ML area and in the study area of 10km radius will be carried out on periodic basis. A comprehensive network for monitoring has been prepared. Sampling locations have been identified by considering the source of pollution due to mining operations, drainage pattern, topography of the area and biological environment.

1.5 Lakhs capital cost has been estimated and for that fund has been allocated towards environmental management and monitoring program of about 1.6 Lakhs as recurring cost.

➤ **Estimated Cost of Environment Monitoring**

Sl. No.	Environment Monitoring Parameters	Annual Cost(in Rs.)
1.	Fugitive Monitoring	20,000.00
2.	Ambient Air Quality Monitoring	30,000.00
3.	Water Quality monitoring	50,000.00
4.	Noise Quality Monitoring	4,000.00
5.	Soil Quality Monitoring	6,000.00
TOTAL		1,10,000.00

11. ADDITIONAL STUDIES

Public Hearing for this Proposed Expansion Project will be conducted. Minutes of the Public Hearing, Issues Raised by the Public and Commitment of the Project Proponent along with Budget will be presented within the Final EIA Report.

Risk Assessment & Disaster Management Plan have been prepared and shall be implemented during mining. The suggestions of the stake holders shall be duly complied with, and half yearly report shall be furnished to SPCB.

Social Impact Assessment has been carried out regarding various socio-economic aspects in the area, which will result in different facilities e. g health services, school,

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drinking water etc. and above all it will also generate enhanced employment facilities for local people directly and indirectly.

Detailed Transport Impact Assessment has been carried out.

12. PROJECT BENEFITS AND COSTS EVALUATION

Mining activity and development go hand in hand. There are numbers of social and infrastructural development activities linked with mining. For example: provision of better infrastructure, schools, green belt development drive and organization of health camps not only for the mine workers but also for the people living in nearby villages under CSR responsibilities. Many ancillary activities bloom in the nearby areas such as opening of dhabas, tea stalls, and vehicle repair shops etc.

Corporate Environment Responsibility

Allocation for Corporate Environment Responsibility (CER) shall be made as per Government of India, MoEF & CC Office Memorandum F.No.22-65/2017-IA.III, Dated 01.05.2018. As per para 6 (II) of the office memorandum, being a green field project & Capital Investment is \leq 100 crores. The project proponent will Investment towards CER as per directions of SEAC/SEIAA. Capital cost is Rs. 5.0 lakhs-. The programs shall be identified in consultation with public representatives and revenue officials.

Corporate Environment Responsibility Cost

S. No.	Description	Amount (INR lakhs)
1.	Health checkup camps	1.0
2.	Surveillance program of the workers	0.40
3.	Insurance cover of workers	0.60
4.	Assistance to local schools, scholarship to students	1.0
5.	Sanitations and drinking water facilities	1.0
6.	Assistance to self-help groups	1.0
Total		5.0

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13. IMPORTANT ASPECTS OF THE ENVIRONMENTAL MANAGEMENT PLAN

Environment Management Plan for the proposed project has been presented below -

Land: Systematic excavation has been proposed to prevent seasonal scouring and enhanced erosion. The topsoil fertile excavated will be very less and it will be mainly used for plantation. Besides top overburden will be dumped in 0.60 ha area of already excavated land present in the eastern side of the proposed mining area.

Geology & Hydrogeology: Waste generation would be less in relation to the pit size. It is proposed to utilize the waste material to prepare/maintenance of the haul road within the lease area and remaining waste will be backfilled in the exhausted portion of the pit. The reclaimed portion will be leveled/ dressed to suit the overall topography of the area.

It is proposed to let the tailings go to the pit only and not to allow them to join the mainstream. Washing of sand is carried out from the water pumped out of the mine. Tailings of the same are diverted back to the pit and no other area is disturbed. Water from the pit is pumped out for washing purpose. The tailings generated during the course of washing is allowed to go the pit only through specially made drains. No other area is affected due to these tailings.

Air Environment: During the course of mining no toxic substances will be released into the atmosphere except dust and smoke. Smoke from the burning of diesel. Dust shall be stopped by sprinkling of water on stack and mining bench. There shall be regular maintenance of vehicle to control air pollution. Plantation will be carried out on approach roads & nearby area.

Water Management: Ground water table shall not be intersected during entire span of mining. No mining shall be done during rainy season. Retaining wall shall be constructed to avoid siltrunoff.

Noise Environment: Mechanized mining shall be the main source of noise. Proper maintenance of all machines will be carried out, which will help in reducing generation of noise during operations. Personal protective equipments shall be provided to all the workers.

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Solid Waste Management: There shall be mining waste generation therefore backfilling is proposed in the existing pit. The area shall be planted as reclamation work. Hazardous wastesuch as used oil generated from mining machinery will be sold to authorized dealer.

Biological Environment: The mining lease area is in non-forest land where presence of fauna is very less and no adverse impact is envisaged on the terrestrial flora and fauna.

Green Belt Development: Even with various dust suppression measures in place, dust generated from mine faces, fine dust produced during mining operations are difficult to control. Therefore, in addition to the above mitigative measures, it is proposed to have a green belt in and around the mine site loading and unloading facilities, and in abandoned mine area during reclamation process. Width of the greenbelt will be maintained at 7.5 m. additionally, all the exposed soils and other erodible materials will be revegetated or covered promptly, while all inactive areas shall be revegetated.

Socio – Economic Environment: The socio-economic impact of mining procedure will bring positive impact such as development of roads, plantation near the haul roads, organization of vocational training to the villagers, opening of schools and direct or ancillary employment benefits. The locals shall be given employment opportunities.

- There shall be better infrastructure availability.
- Health camps, availability of clean drinking water & provision of schooling shall be the main focus of the company.