

**EXECUTIVE SUMMARY OF
DRAFT ENVIRONMENTAL IMPACT ASSESSMENT AND
ENVIRONMENTAL MANAGEMENT PLAN**

FOR

**LIMESTONE QUARRY,
LEASE AREA: 4.26 Ha.**

PROPOSED PRODUCTION CAPACITY -1,50,150 Tons/Annum (60060 m³)

AT

**Khasra no. 395, 405/1, 405/2, 405/3, 406, 407, 408/1, 408/2, 408/3, 408/4, 409, 424/2,
426/1, Village Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh**

**Project Activity - Mining of Minerals 1(a) (i)
Project Category – B1**

ToR Letter No.1671/SEAC, CG./Mine/2076Nawa Raipur Atal Nagar dated 14/12/2022

MONITORING PERIOD- 1th DECEMBER 2022 to 28th FEBRUARY 2023

**PROJECT PROPONENT
M/s SHRI KAMLESH PANDEY
NIWASI- KOLIHAPURI, P.O- PISEGAON
TEHSIL & DIST.- DURG(C.G.)**

ENVIRONMENT CONSULTANT

P and M Solution

**Address: C-88, Sector 65, Noida -201301 – U.P,
A NABET ACCREDITED CONSULTANT**

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

EXECUTIVE SUMMARY

Project Proposal			
<p>“Limestone Quarry” Mine comes under located at Khasra no. Part of 395, 405/1, 405/2, 405/3, 406, 407, 408/1, 408/2, 408/3, 408/4, 409. 424/2, 426/1 Village-Nandini Khundini, Tehsil- Dhamdha, District- Durg, State-Chhattisgarh</p> <p>Proponent M/s Shri Kamlesh Pandey Niwasi- Kolihapuri, P.O- Pisegaon Tehsil & Dist.- Durg(C.G.)</p>			
Location of the applied area			
Village & Tehsil	Village-Nandini Khundini Village, Tehsil- Dhamdha		
District & State	District-Durg, Chhattisgarh		
Extent of the ML area	4.26Hectares,Privateland		
Survey of India Map No.	64 G/7		
Latitudes	BP.No.	Latitude	Longitude
Longitudes	1	21°24'47.97"N	81°22'48.81"E
	2	21°24'47.59"N	81°22'49.62"E
	3	21°24'46.92"N	81°22'49.61"E
	4	21°24'46.28"N	81°22'52.86"E
	5	21°24'44.43"N	81°22'48.81"E
	6	21°24'44.28"N	81°22'52.64"E
	7	21°24'42.99"N	81°22'52.33"E
	8	21°24'42.63"N	81°22'52.51"E
	9	21°24'40.94"N	81°22'51.94"E
	10	21°24'40.57"N	81°22'53.39"E
	11	21°24'39.37"N	81°22'53.59"E
	12	21°24'38.14"N	81°22'53.44"E
	13	21°24'38.40"N	81°22'51.07"E
	14	21°24'38.85"N	81°22'49.04"E
	15	21°24'38.75"N	81°22'48.68"E
	16	21°24'39.53"N	81°22'45.08"E
	17	21°24'40.64"N	81°22'45.28"E
	18	21°24'39.88"N	81°22'49.15"E
	19	21°24'41.13"N	81°22'49.65"E
	20	21°24'41.84"N	81°22'46.54"E
	21	21°24'43.42"N	81°22'46.83"E
	22	21°24'43.65"N	81°22'45.68"E
	23	21°24'45.81"N	81°22'46.06"E
	24	21°24'46.04"N	81°22'46.81"E
	25	21°24'45.57"N	81°22'47.31"E
	26	21°24'45.64"N	81°22'48.01"E
Transport Network			
Nearest City/ Town	Nandini Khundini Village, Approx. 1.7 Km in SE		

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

	direction
Nearest Railway station	Bhilai Power House which is approx. 27 km in S direction
Nearest Airport	Raipur Airport, Raipur-Approx. 44.2 km in SE.
Archeological Place	No Archeological place in the study area.
National Park, Wild Life Sanctuary, Wild Life Corridors, Biosphere Reserves, Protected Forest , Migratory routes for Birds etc. within 10 Km radius study area	None
Reserve Forest and Protected Forest within 10 Km radius	No any Reserved / Protected Forest within 15 km radius.
Water bodies within 10km radius	Sheonath River- Approx. 1.4 m in West Direction
Mining Details	
Geological Reserves	13,23,750tons
Production Capacity, cum/annum	1,50,150 Tons/annum
Method of Mining	open cast manual mining method
Total Project Cost	Rs. 73.00 Lakhs
Cost for Environmental Protection Measures	Capital Cost-Rs. 4,30,000/- Recurring Cost-Rs. 30,000/-

1.0 Introduction

The proposed “Limestone Quarry” Mine comes under located at Khasra no. 395, 405/1, 405/2, 405/3, 406, 407, 408/1, 408/2, 408/3, 408/4, 409. 424/2, 426/1 Village Nandini Khundini, Tehsil- Dhamdha, District- Durg, Chhattisgarh, Area- 4.26 Ha, the proposed Limestone Quarry production capacity from the mine lease is 1,50,150 Tons/Annum belongs to M/s Shri Kamlesh Pandey. The lease for mining of Limestone Quarry over an area of 4.26 Ha was granted by the Government of Chhattisgarh. The Letter of Intent for the lease has been granted for 30 years to Project Proponent Shri Kamlesh Pandey Mining Office Durg, vide letter no. 61, dated- 13/04/2022. The Mine Plan has been approved by Mining Officer Durg, Chhattisgarh vide letter no. 179 dated 05/05/2022 for a production capacity of maximum 1,50,150 Tons per year. The proposed production capacity of the mine is 1,50,150 Tons/annum of Limestone Quarry. The mining operation will be manually opencast method. The sequences of operations are removal of over burden, sizing, loading and transportation of Minerals.

This EIA has been prepared as per the Terms of Reference granted and the EIA Notification. Further to assess the impact on environment, it is necessary to ascertain present status of environment prevailing at the project site and proposed operation including identification and Assessment of impact on the environment.

Keeping these points and statutory requirement in view, this Environment Impact Assessment Report and Environmental Management Plan (EMP) (here in after described as the EIA/EMP Report) has been prepared. Environmental Study has been carried out within 10 km radius of the mine area over a period of **01st December, 2022 to 28th February, 2023.**

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

1.1 Need for the Project

Minerals are the chief source of present phase of industrialization and play an important role in the present phase of the national economy and overall development of the nation. The Flag Stone slabs produced from the quarry will be supplied for the purpose of slab cuttings, and then it will be sold to end user for construction purpose, at present due to growing fashion of ceramic tiles in rural area also, the demand of the flag stone is reduces, therefore the quarry management is focused on the by product as khanda and kattal which is being generated during the flag stone cutting.

2.0 Topography and Drainage Pattern

Topography: The area is about 1.7km from the village Nandini Khundini in the North West direction. Some part of the lease area (about 1200 m²) having old pit of 4.5m depth from the surface and rest part is almost flat terrain with devoid of vegetation. The general surface level is about 308 m from M.S.L the lease area has been surveyed on a scale of 1:1,000 with contour interval of one meter.

Drainage Pattern: Mahanadi River is present at about 170 m in west direction from the lease area. The drainage pattern is dendretic to sub dendretic.

2.1 Geology

The area showing a nature and extent of the mineral body. The area round Nandini Khundini village comes under Chandi Formation of Raipur Group of Chhattisgarh Super Group. The Chandi Formation dominated by purple to grey stromatolitic, hard and compact, calcareous rock showing stromatalitic structure. Limestone is the largest formation (by thickness and area) in Hirri Sub Basin; but, it is very poorly developed in the Baradwar Sub Basin. Chandi Formation is predominantly dolomitic at many places like around Ramgarh-Vedparsada. Baradwar-Ghugri ru1.d Baramkela.-Sariya- Bonda areas. Sub division of the Chandi Formation in to Niwari, Pendri and Pinaniya members were based mainly on color (Murti, 1987). The Classification is useful, specially for mining but only at local scale.

The area showing a nature and extent of the mineral body

The area around Nandini Khundini which is situated in Tehsil Dhamdha is covered by Limestone of Chandi formation of Raipur Group of Chhattisgarh Supergroup. This mineral body is homogeneous in nature. On the basis of detailed geological mapping nearby pits etc of the area and lithology of the area following sequence:

Soil

Lime stone

(Source- Approved Mining Scheme)

2.2 Geological Reserve of Limestone in fresh Area

Area (m²) x depth = Volume (m³) x BD = Tonnage

35300 x 15 x 2.5= 1323750 tons

Hence, the Geological Reserve comes to 1323750 tons

Blockage of Reserve

A. Reserve Blocked in Mine Limit of 7.5m in fresh area

Area (m²) x depth (m) x BD = Tonnage

$$7300 \times 15 \times 2.5 = 273750 \text{ tons}$$

B. Reserve Blocked due to Narrow space in Northern & Western parts of the area

Area (m²) x depth (m) x BD= Tonnage

$$1190 \times 15 \times 2.5 = 44625 \text{ tons}$$

C. Reserve Blocked in Benches

Benches	Area	Depth	Volume	Tons
1st bench	1345	13.5	18158	45394
2nd bench	1329	12	15948	39870
3rd bench	1313	10.5	13787	34466
4th bench	1297	9	11673	29183
5th bench	1825	7.5	13688	34219
6th bench	1034	6	6204	15510
7th bench	1019	4.5	4586	11464
8th bench	1004	3	3012	7530
9th bench	990	1.5	1485	3713
Total	-	-	88541	221349

Total Bench Blockage = 221349 tons

**Total Blocked Reserve (A+B+C)= 273750 + 44625 + 221349
= 539724 tons**

**Mineable Reserve= (Geological reserve– Blocked reserve)
=1323750 - 539724
= 784026 tons (313610 m³)**

**Recoverable Reserve = 784026 x 0.95 (5 % mining loss)
= 744825 tons (297930 m³)**

Anticipated Life of mine:

The estimated mineable reserve of this area is of the order of **744825 tons** up to 12 m below soil cover. The Conceptual quarry plan is prepared for the lease period of 5 years and anticipated life of mine is about 10 years.

(Source- Approved mine plan)

2.3 Method of Mining:

Quarrying will be earned out by open-cast method adopting a system of benches . Mode of working will be manual. Only development work will be carried out by excavator and cutting of

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

stone on mine surface will be carried out by stone cutter. Manual labors are deployed for quarrying and loading of sized stone on Truck/tractor. Truck/ tractor will be used for transporting of flag.

Table 1 Year wise productions

Year	Depth of Pit mRL	Area in m ² (a)	Depth in m (b)	Volume of ROM in m ³ (c=a*b)	Volume of ROM/Year in m ³ (d)	Volume of ROM/Year in tons (d*2.5)
1st Year	270.0-268.5 (1 st bench)	26850	1.5	40275	40275	100688
2nd Year	268.5-267.0 (2 nd bench)	25500	1.5	38250	450000	112500
	267.0-265.5 (3 rd bench)	4500	1.5	6750		
3rd Year	267.0-265.5 (3 rd bench)	19674	1.5	29511	45000	112500
	265.5-264.0 (4 th bench)	10326	1.5	15489		
4th Year	265.5-264.0 (4 th bench)	12534	1.5	18801	45000	112500
	264.0-262.5 (5 th bench)	17466	1.5	26199		
5th Year	264.0-262.5 (5 th bench)	4100	1.5	6150	60060	150150
	262.5-261.0 (6 th bench)	19740	1.5	29610		
	261.0-259.5 (7 th bench)	16200	1.5	24300		
Total	-	-	-	235335	235335	588338

Mineable reserves and anticipated life of the quarry

- a) Estimated Mineable Reserves :784026 tons (313610 m³)
- b) Average rate of production Per year during First Five year plan: 117668 tons (47067 m³)
- c) Anticipated life of the mine :More than 5 years (upto a depth of 15 m)

Conceptual Quarry Plan

The estimated mineable reserve of this area is of the order of 784026 tons up to 15 m from surface. The Conceptual quarry plan is prepared for the lease period of 5 years and anticipated life of mine is more than 5 years.

Ultimate pit limit is fixed keeping final pit slope at the angle of 45°, This will cover about 2.685 ha area in first five year and 0.1218 ha in after five year plan period.

Exploration:

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

As the quarry area is less than five hectares, the prospecting / exploration work is not required as the existence of mineral in the area have already been established.

Drilling and Blasting

Drilling

Drilling will not be required for exploration work but jack hammer drilling may be used for blasting purpose to break the hard rock in this scheme period. Drilling of the blast holes is proposed by the compressed air operated jack hammer or wagon drill. Height of the bench is proposed to be kept at 1.5 m. The jack hammer will drill up 1.5m depth and such as the balance excavation will be in three to four ages. The specification of the jack hammer and wagon drills are as follows-

Table 2-4 Drilling Pattern for Jack Hammer

Type	Make	No.	Diam. Of Hole	Drilling Rods	Capacity	Motive Power	HP
Tractor	Hindustan	1	30-	1500mm	210 CFM	Diesel	50
Compressor or Jack Hammer	Atlas COPCO	1 2+1	40mm			Compressed	

Source: Approved Mining Plan

Blasting: (Broad Parameters)

The quarry operation will be in small scale and the maximum production per year will be 150150 tons (60060 m³) in five year. In view of this small scale quarrying activity the blasting parameters will be simple and use of explosive will also be less. Blasting will be done by Simple Square and triangle pattern. Blasting will be done by licensed contractor. The lessee will be obtain necessary permission from DGMS before blasting & inform DM and DGMS in form 13.

The mineralization in the QL area is mineable to direct excavation by hydraulic excavators only after blasting and based up on the nearby mining activity, about 70% of the total excavation is consider for the blasting.

Broad Parameters:

Parameters	Wagon Drill
Spacing	1.5
Burden	0.5 m
Depth of Hole :	1.5 m
Charge per Hole	350 gms.
Powder Factor :	8.03 t./kg
Dia of Hole	32mm

Type of Explosive Used/ to be used

Slurry Explosive frequency of blasting will be once or twice a week. Delay detonators will be used.

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

Powder Factor in Ore and overburden

8.03t/kg of explosive in ore. Blasting will be done for heaving purpose only.

Powder factor: $1.5m \times 0.5m \times 1.5m \times 2.5t / 0.35 \text{ kg} = 8.03/\text{kg}$

Yearly production : 60060 m^3 or $60060 \times 2.5t = 150150$ tonne

Average daily excavation: $150150/300 = 500.5$ ton

Average quantum of explosive to be required daily = $500.5/8.03 =$ about 62.32 kg

Whether Secondary Blasting is needed:

Secondary blasting will not be needed.

Storage of Explosives:

As Blasting will be done by licensed contractor, hence magazine is not required in mining area.

Precautions to be observed during Drilling and Blasting:

All the necessary precautions such as hoisting of red flag at a safe Distance, alarming the people by whistling and shouting will be taken before blasting. A qualified blaster having blasters certificate will do blasting, Muffle blasting and wet drilling will be done to control flying rock particles to avoid effect on nearby agricultural fields.

3.0 Baseline Data, Impact Assessment and Management Plan

The EIA report incorporates one season data generated for a period from **01st December 2022 to 28th February 2023**. A summary of the same is presented below:

3.1 Meteorology

Site Specific meteorological data is given in **Table4** and wind rose is given in **Figure 1**.

Table 4:Site Specific Meteorological Data

Month	Temperature °C		Wind Speed (Km/hr.)
	Min	Max	Avg.
December,2022	8.0	20.0	2.9
January, 2023	2.0	12.0	3.6
February, 2023	8.0	25.0	4.7

Source: Meteorological at station site

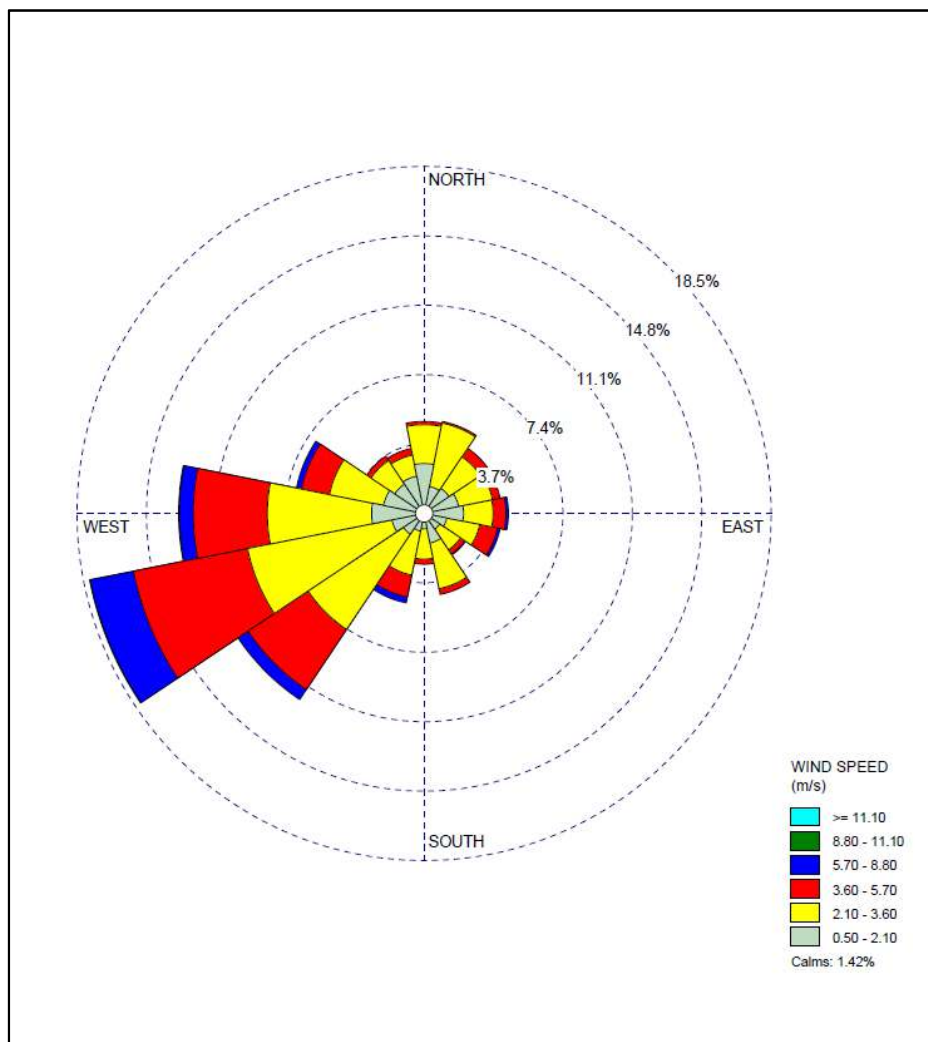


Figure 1: Wind Rose

3.2 Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for the period of during **1stDecember 2022 to 28thJanuary 2023** at 12 locations including the Plant area and in nearby villages. Total 8 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM₁₀), Fine Particulates (PM_{2.5}), Sulphur Dioxide (SO₂), and Oxides of Nitrogen (NO_x) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 5**.

Table5: Summary of Ambient Air Quality Results

Parameters	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	SO ₂ (µg/m ³)	NO ₂ (µg/m ³)
AAQM Norms	100	60	80	80
AAQ-1				
MIN	76.5	38.6	10.8	15.5

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

MAX	91.2	48.1	15.2	22.3
AVERAGE	82.2	42.3	13.0	18.5
98 %TILE	89.7	46.7	14.9	21.8
AAQ-2				
MIN	76.2	36.4	11.4	16.7
MAX	90.6	43.6	16.0	21.4
AVERAGE	81.5	38.8	13.4	18.9
98 %TILE	89.4	43.2	15.9	21.3
AAQ-3				
MIN	55.7	22.7	10.2	13.6
MAX	66.3	28.6	13.8	20.6
AVERAGE	61.4	25.9	12.1	16.9
98 %TILE	66.3	28.5	13.7	20.4
AAQ-4				
MIN	69.6	34.8	10.6	12.8
MAX	81.2	42.8	14.6	21.2
AVERAGE	75.1	37.8	12.3	17.0
98 %TILE	80.9	41.8	14.4	20.8
AAQ-5				
MIN	52.8	22.3	9.2	12.8
MAX	63.9	28.2	13.6	21.3
AVERAGE	58.3	25.1	11.3	16.4
98 %TILE	63.4	28.0	13.5	21.0
AAQ-6				
MIN	44.4	20.9	9.0	12.1
MAX	51.6	22.8	9.6	12.3
AVERAGE	61.3	27.3	13.6	18.3
98 %TILE	57.2	25.5	11.1	15.1
AAQ-7				
MIN	46.1	17.4	10.6	12.9
MAX	61.8	27.2	14.5	21.1
AVERAGE	53.5	23.6	12.2	17.6
98 %TILE	61.2	27.1	14.5	21.1
AAQ-8				
MIN	50.6	20.6	9.4	12.6
MAX	57.8	25.6	13.6	21.8
AVERAGE	53.7	23.1	11.0	14.9

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

98 %TILE	57.6	25.4	13.2	20.0
-----------------	------	------	------	------

From the above results, it is observed that the ambient air quality with respect to PM₁₀, PM_{2.5}, SO₂ and NO_x at all the monitoring locations was within the permissible limits specified by CPCB.

3.3 Ambient Noise Levels

Ambient noise level monitoring was carried out at the 8 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 6**.

Table 6: Summary of Ambient Noise Level Monitoring Results [Leq in dB(A)]

Time (Hrs)		Nandni Khundni Project Side	Patheria	Hardi	Nandni Khundani	Medesara	Kareli	Dhamda	Ghatiyakala
Day Time	600	50.3	48.6	44.2	49.2	41.5	44.6	40.5	40.6
	700	52.4	50.8	46.9	51.3	42.8	47.2	43.6	41.5
	800	53.4	51.6	50.2	52.2	45.7	48.5	45.3	41.2
	900	55.2	53.6	52.1	54.2	48.6	50.2	49.5	42.6
	1000	52.6	52.7	53.6	53.2	52.3	49.6	52.6	48.5
	1100	53.7	51.9	51.8	52.6	50.7	51.2	51.7	50.2
	1200	49.8	47.6	50.6	50.2	51.6	50.8	46.8	48.2
	1300	50.7	48.2	49.4	47.6	48.5	47.2	50.3	45.6
	1400	49.8	50.6	51.2	48.5	47.9	49.2	48.2	46.7
	1500	48.3	46.8	52.3	46.9	48.9	47.6	49.5	50.2
	1600	46.8	44.6	49.6	46.7	51.2	48.2	51.6	45.9
	1700	50.2	48.2	50	47.2	48.2	49.7	45.7	43.2
	1800	51.6	50.6	47.8	50.6	48.2	48.2	49.2	40.6
	1900	49.8	47.6	48.2	48.2	47.5	50.2	47.3	42.1
	2000	50.6	48.2	47.2	49.6	50.2	48.3	48.2	45.3
2100	49.2	47.2	49.6	48.5	46.7	46.8	46.7	42.8	
2200	48.6	46.3	48.6	47.2	47.3	47.2	42.3	40.6	
Night Time	2300	45.2	44.8	41.6	45.6	42.6	43.6	40.8	39.6
	2400	43.2	42.6	40.5	41.6	40	44	40.2	40.5
	100	40.2	38.2	39.8	39.4	42.3	42.6	41.6	38.5
	200	41.7	41.5	37.6	39.2	38.2	38.2	39.8	37.6
	300	40.6	38.6	36.8	40.5	37.2	39.6	40.2	38.9
	400	41.3	40.5	40.5	41.6	39.6	39.5	40.8	37.2
	500	44.2	42.1	41.8	41.6	40.2	41.2	39.8	39.3
Range	40.2-55.2	38.2-53.6	36.8-53.6	39.2-54.2	37.2-52.3	38.2-51.2	39.8-52.6	37.2-50.2	
Ld	51.3	49.8	50.2	50.3	48.9	48.8	48.6	45.7	
Ln	42.7	41.7	40.1	41.9	40.4	41.7	40.5	38.9	
Ldn	51.8	50.4	50.1	50.8	49.4	49.9	49.3	46.9	

3.4 Ground and Surface Water Resources & Quality

Ground Water

Sampling was carried out at 8 locations during the study period. Sampling and analysis was carried out, as per standard methods and frequency of the sampling was thrice/stations. the summary of the results is presented below:

Analysis results of **Ground Water** reveal the following:

- **pH** varies from to 7.13 to 7.69
- **Total Hardness** varies from 178 to 448mg/L.

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

- **Total Dissolved Solids** varies from 136.0 to 491.0 mg/L.

Analysis results of **Surface Water** reveal the following:

- **pH** varies from to 7.31 to 7.52
- **Total Dissolved Solids** varies from 168 to 209 mg/L.
- **BOD** varies from 1.6 to 1.8 mg/L.
- **COD** varies from 11.8 to 20.6 mg/L.

The heavy metal contents are found to be negligible. Water quality is excellent but it is not potable due to presence of coliform. It can be used for drinking purpose after installing bacteriological.

3.5 Soil Quality

Sampling was carried out at 8 locations during the study period. The summary of the results are presented below:

- pH in soil sample was observed in the range **6.31 to 7.81**
- Organic Matter was observed in the range of **0.18 % to 1.41%**.

3.6 Biological Environment

Rare and Endangered Flora in the Study Area

The IUCN Red List is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity. **Among the enumerated flora in the study area, none of them were assigned any threat category, by RED data book of Indian Plants.**

4.0 IMPACT ASSESSMENT AND MITIGATION MEASURES

4.1 AIR Pollution

The air quality modeling has been done and the details are given below:

Sr. No.	Activity in the Quarry	Maximum Baseline Concentration ($\mu\text{g}/\text{m}^3$)	Incremental GLCs ($\mu\text{g}/\text{m}^3$)	Resultant Concentration ($\mu\text{g}/\text{m}^3$)	Limit (Industrial, Residential, Rural and other area) ($\mu\text{g}/\text{m}^3$)
1.	Excavation+Loading+Transportation	82.2	1.60	83.80	100

Prevention and Control of Air Pollution

- The dust generated during the process will be minimized by water spray at the working faces before and after the activity.
- Plantation will be carried out on approach roads and in Lease boundary.

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

- Planning transportation routes of mined material so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road;
- Personal Protection Equipment’s (PPE) like dust masks, ear plugs etc. will be provided to mine workers.
- Speed limit will be enforced to reduce airborne fugitive dust from vehicular traffic.
- Deploying PUC certified vehicles to reduce their noise emission.
- Spillage from the trucks will be prevented by covering tarpaulin over the trucks.

4.2 Water Quality Management

The impact of mining project on groundwater hydrology and surface water regime are site specific and depends upon the characteristics of the mineral, hydrogeology and requirement of groundwater for other uses.

ANTICIPATED IMPACTS

- No natural course of water stream is interrupted or diverted due to mining activity; hence no impact on natural drain is anticipated.
- Surface run off distribution during rainy season may get affected due to excavated pits and overburden stack.
- Runoff from the mining benches or from overburden during the rainy season may get contaminated.
- Ground water pollution can take place only if the mining rejects contain toxic substances, which get leached by the precipitation water and percolate to the ground water table thus polluting it. Any nearby wells or other sources of water can be rendered unfit for drinking and even for industrial use.
- Domestic sewage will be generated which can create contamination.

MITIGATION MEASURES

- Overall drainage planning has been done in such a manner that the existing pre-mining drainage conditions will be maintained to the extent possible so that run off distribution is not affected.
- The waste dump will be protected by retaining walls around the dump., moreover the excavated mineral itself is non-toxic and hence no effect due to water flow during rains following the contours of the area is expected.
- The excavated pit will be converted into the water reservoir at the end of mine life. This will help in recharging ground water table by acting as a water harvesting structure.
- Garland drain will be constructed on all sides of quarry along with settling pond in the lowermost part to remove the suspended solids from storm water. The collected water shall be used in plantation and spraying on haul roads. Settling ponds will be designed on the basis of silt loading, slope of the lease, detention time required etc.
- Septic tanks and soak pits will be provided for the disposal of domestic effluent generated from mine site.

Executive Summary for Limestone Quarry” at Village- Nandini Khundini, Tehsil- Dhamdha, District Durg, Chhattisgarh by M/s Shri Kamlesh Pandey

4.3 Noise Pollution Control

The area generally represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine. As the project is proposed for open cast manual method mining.

Noise pollution is mainly due to occasional plying of trucks. These activities will not cause any problem to the inhabitants of this area because there is no human settlement in close proximity to the lease area.

ANTICIPATED IMPACT

- The source of Noise pollution will be the vehicular movements.
- Noise will be generated by the digging of mine area using shovels, crowbars etc.

MITIGATION MEASURES

- **Maintenance of Machinery:** - The vehicles operating will be maintained and provided with good silencers. All machines will be used at optimum capacity.
- **Vegetation:** Plantation of trees around haul roads will be done to reduce the noise.
- **Hearing Protection:** Equipment like ear-muffs, ear-plugs, etc. are commonly used devices for hearing protection.

4.4 Greenbelt Development and Plantation

A green belt will be developed along the roads, barren area, surrounding office, rest shelter and other social forestry program. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. It is proposed to total number of plants **2600 numbers sapling during 1st five years.**

Table- 8 Details of Greenbelt sapling during 1st three years

Year	Plantation Description	Cost	Total Cost
1st Year	810 (75 Nos., Katang Bans, 75 Nos, Arjun, 75 Nos., Neem, 75 Nos. Karanj) with fencing	300 No. x 30 Rs.= 9000/- (Plants) Fencing = 30,000/- (Fencing) Fencing Pillars= 10000/-	69,500/-
	Compost	2,500/-	
	Water (Aprox. 300 KL)	18,000/-	
2nd Year	Compost	2,500/-	20,500/-
	Water (Aprox. 300 KL)	18,000/-	
3rd Year	Tree Guard maintenance and water	25000/-	25000/-
4th Year	Tree Guard maintenance and water	25000/-	25000/-
5th Year	Tree Guard maintenance and water	25000/-	25000/-
Total			1,65,000/-

4.5 Solid and Hazardous Waste Generation and Management

No solid waste will be generated.

4.6 EMP and CER Details

Table 9 Budgets for Common Environmental Management Plan for Cluster

Particulars		1 st Year	2 nd Year	3 rd Year	4 th Year	5 th Year
Pollution control generate due to dust generation during movement of vehicles from mine site to nearest SH-7 (approx. 2.1 km)		5,00,000	5,00,000	5,00,000	5,00,000	5,00,000
both side plantation on access road (8000 No's)	Amount for plantation (90% survival rate)	5,50,000	50,000	50,000	50,000	50,000
	Amount for Fencing	19,90,000	-	-	-	-
	Fertilizers, seeds & maintenance of plant	7,50,000	7,00,000	7,00,000	7,00,000	7,00,000
Environment Monitoring (Quarterly)		3,00,000	3,00,000	3,00,000	3,00,000	3,00,000
Maintenance of Road/Approach Road		2,50,000	2,50,000	2,50,000	2,50,000	2,50,000
Plantation of trees at Village Road (upto 2 K.M.)		2,00,000	50,000	50,000	50,000	50,000
Total		45,40,000	18,50,000	18,50,000	18,50,000	18,50,000

Participation of Project proponent in Common EMP

both side plantation on access road (1000 No's)	Amount for plantation (90% survival rate)	60,000	10,000	10,000	10,000	10,000
	Amount for Fencing	270,000	-	-	-	-
	Fertilizers, seeds & maintenance of plant	1,00,000	20,000	20,000	20,000	20,000

It is proposed to undertake the need specific proposed CER activities in the surrounding areas of the mine. The project proponent has proposed to incur budget of **Rs. 1,46,000/-** for CER activities.

The detailed CER activities will be decided after public Hearing and same will be incorporated in Final EIA.

5.0 CONCLUSION

As discussed, it is safe to say that the project is not likely to cause any significant impact on the ecology of the area, as adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the project.