EXECUTIVE SUMMARY

OF PROPOSED

Limestone mine

Khasra No – 175/1, 175/3 & 193 Village-Tikanpal,
Tehsil – Bastar, District -Bastar, Chhattisgarh

Total Area : 2.664 ha

Submitted to
Member Secretary
Chhattisgarh Environment Conservation Board

Applicant:
Applicant: Ganesh Ram
Village – Sonarpal Tehsil: Bastar,
District: Bastar (Chhattisgarh) 494001

ENVIRONMENT CONSULTANT:
PARAMARSH
Servicing Environment and Development
(Accredited by QCI / NABET)
Ms 1/10, Sec A Aliganj, Near Ram Ram Bank Chauraha
Lucknow- 226021, Uttar Pradesh

February 2022

SUMMARY

INTRODUCTION

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

PROJECT DESCRIPTION

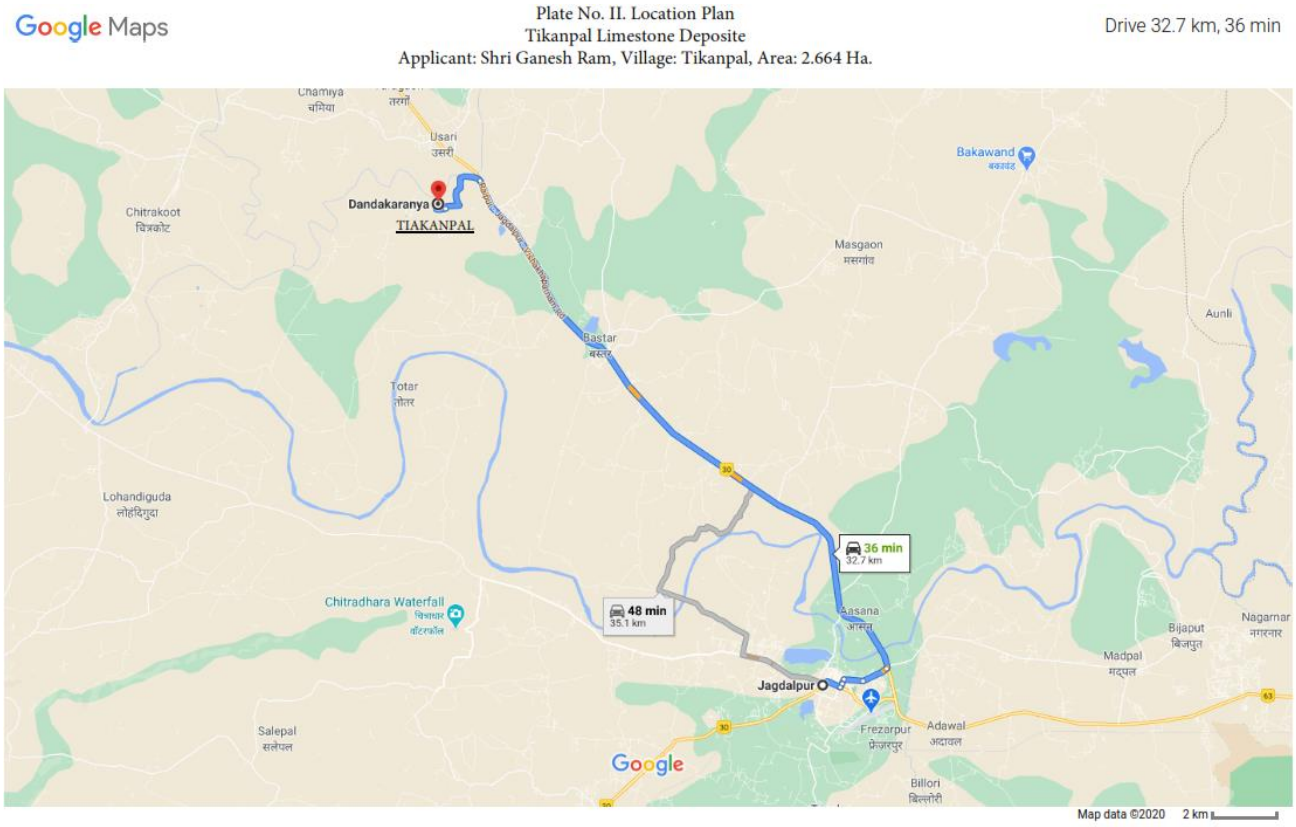
The project of limestone mine lies in Village-Tikanpal, Tehsil & District -Bastar, Chhattisgarh . The details of mine lease areas are given in Table 1.1. The area is marked in the survey of India Toposheet No. 65E/16 is given in Figure 1.1 and the map showing the mining lease areas is given in Figure 1.2

S. No.	Name of Mine Lease	Lease Area (ha)	Type of Land
1	limestone mine Khasra No 175/1,175/3 & 193	2.664	Private Land

1.2.2 Location of the Project

The above said limestone mining project lies in Village-Tikanpal, Tehsil & District -Bastar, Chhattisgarh. The area lies in the latitude of 19° 15' 28.1077" N to 19° 15' 36.8432" N and longitude of 81° 52' 17.6749" E to 81° 52' 23.2943" E Coordinate map and Location Map of the mining projects is shown in Figure 1.1 and 1.2.The Study area marked in Survey of India Toposheet Map is shown in Figure 1.3. The Project Site Photographs of the individual lease area is enclosed in Annexure-VIII.

Plate No. II. Location Plan
Tikanpal Limestone Deposite
Applicant: Shri Ganesh Ram, Village: Tikanpal, Area: 2.664 Ha.



VIDYA SAGAR SAHU
(RQP/DGMCG/102/2019)

Connectivity:

The quarry area is located about 1.00 km. meters due north of village - Tikanpal, which is connected by good tar road from the Bastar, Jagdalpur and Balenga. The district head quarter Bastar and other important commercial places are 25 kms, from the quarry lease area. The nearest public works department, rest house is located at Bastar 8.50 km. In south-east of lease area. Buses and local taxi are continuously plying from Bastar and Jagdalpur for Tikanpal village:

The Project and its Location

The limestone mining projects lies in Village-Tikanpal, Tehsil & District -Bastar, Chhattisgarh in Chhattisgarh. The area lies in the latitude of 19° 15' 28.1077" N to 19° 15' 36.8432" N and longitude of 81° 52' 17.6749" E to 81° 52' 23.2943" E.The project falls under Category “B” as per EIA Notification 2006 and as amended so far. The silent features of the project site are given in **Table 10-1**.

PLATE NO - III

Scale 1:50000

TIKANPAL LIMESTONE DEPOSIT
APPLICANT: SHRI GANESH RAM

PREDOMINANT WIND DIRECTION AT VILL. Piplawand 25 KM. SW OF DIST. HEADQUARTER JAGDALPUR

0 2 4 8
Kilometers

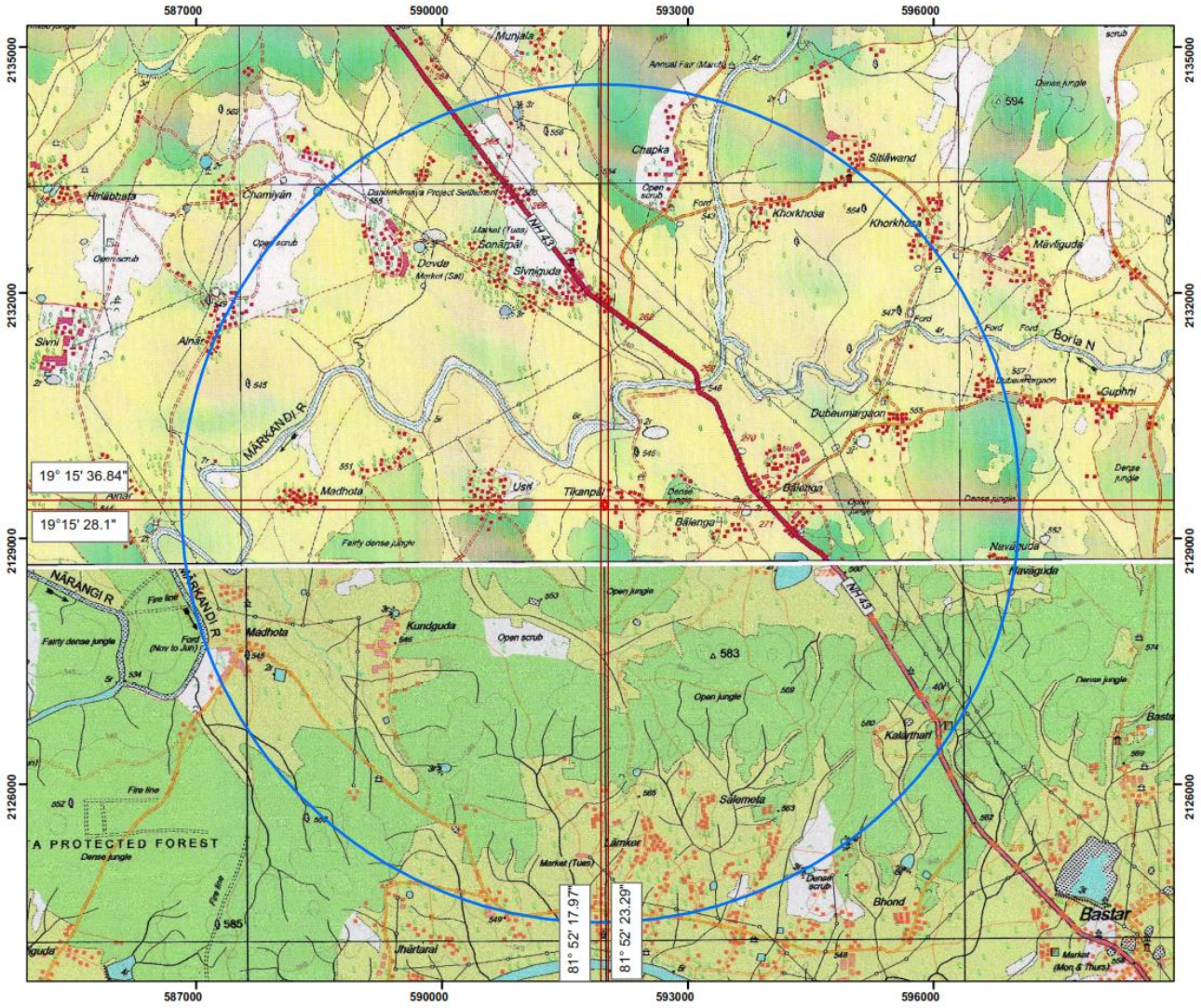
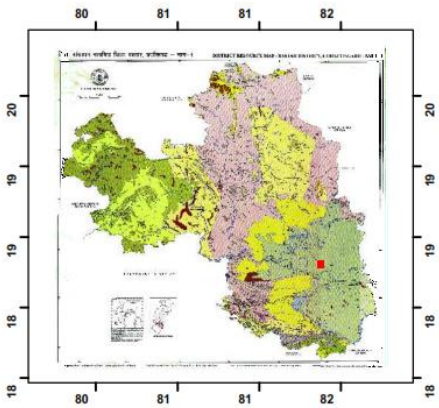


PLATE NO - III



Legend

- 5KM Buffer Zone
- Lease Boundary

LESSEE:	SHRI GANESH RAM
MINERAL:	LIMESTONE (QUARRY STONE)
AREA:	2.664 HECT.
VILLAGE:	TIKANPAL
TEHSIL:	BASTAR
DISTRICT:	BASTAR (CHHATTISGARH)
KHASRA NO:	175/1, 175/3 & 193
TOPOSHEET NO.:	65 E/15

VIDYA SAGAR SAHU
RQP/DGMCG/102/2019

Table 10-1: Salient Features of the Project Site

The salient feature of the project is given below:

<table>
<tr><td colspan="3">1. Basic Information</td></tr>
<tr><td>S. No.</td><td>Item</td><td>Details</td></tr>
<tr><td>1.</td><td>Project Name and Location</td><td>Proposed environment clearance of limestone Mine (Minor Mineral) over an area of ha, at Khasra No – 175/1, 175/3 & 193 Village-Tikanpal, Tehsil – Bastar, District -Bastar, Chhattisgarh</td></tr>
<tr><td>2.</td><td>Location / site (GPS Co-ordinates)</td><td>
<table>
<tr><th>Points</th><th>LONGITUDE</th><th>LATITUDE</th></tr>
<tr><td>P1</td><td>19° 15' 36.8432" N</td><td>81° 52' 20.0406" E</td></tr>
<tr><td>P2</td><td>19° 15' 34.8824" N</td><td>81° 52' 23.2943" E</td></tr>
<tr><td>P3</td><td>19° 15' 31.8469" N</td><td>81° 52' 22.5098" E</td></tr>
<tr><td>P4</td><td>19° 15' 31.5029" N</td><td>81° 52' 21.7477" E</td></tr>
<tr><td>P5</td><td>19° 15' 31.0071" N</td><td>81° 52' 21.6576" E</td></tr>
<tr><td>P6</td><td>19° 15' 30.1426" N</td><td>81° 52' 22.5678" E</td></tr>
<tr><td>P7</td><td>19° 15' 28.1077" N</td><td>81° 52' 21.7228" E</td></tr>
<tr><td>P8</td><td>19° 15' 29.3085" N</td><td>81° 52' 19.1994" E</td></tr>
<tr><td>P9</td><td>19° 15' 29.1545" N</td><td>81° 52' 17.9777" E</td></tr>
<tr><td>P10</td><td>19° 15' 35.0400" N</td><td>81° 52' 17.6749" E</td></tr>
<tr><td>P11</td><td>19° 15' 34.5277" N</td><td>81° 52' 19.5527" E</td></tr>
</table>
</td></tr>
<tr><td>3.</td><td>Size of the Mining Lease (Hectare)</td><td>Area 2.664 ha</td></tr>
<tr><td>4.</td><td>Capacity of Mining Lease (TPA)</td><td>Maximum proposed production 53509 TPA, year wise production summarized in table
<table>
<tr><th>Year</th><th>Production (t)</th></tr>
<tr><td>First Year</td><td>43605</td></tr>
<tr><td>Second Year</td><td>53509</td></tr>
<tr><td>Third Year</td><td>49946</td></tr>
<tr><td>Fourth Year</td><td>43937.5</td></tr>
<tr><td>Fifth Year</td><td>43937.5</td></tr>
<tr><td>Total</td><td>234935</td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>Mineral Reserve in MT</td><td>Total Mineable reserve is 501372 Tones</td></tr>
<tr><td>6.</td><td>Period of Mining Lease</td><td>30 Years</td></tr>
</table>

7.	Expected cost of the Project	Rs. 80.0 lakh per Year
8.	Name and Address of the Applicant	Ganesh Ram Village – Sonarpal, Tehsil -Bastar, District -Bastar (Chhattisgarh) 494001
9.	Land Use	Private land
10.	Minerals of mine	limestone
11.	Nearest Habitat/ Town	❖ Hospital: Govt. Hospital Balenga at 2.00 km ❖ CMGSY – 150 meters ❖ Tikanpal Village – 0.50 km in East
12.	Nearest Railways Station	Railway Station: Jagdalpur 24.0* km (SE)
13.	Nearest Airport	Airport: Raipur – 225.0* km (N).
14.	Nearest Highway	NH 43 – 2.00 km
15.	Nearest River	Markandi River at 0.2 km Indrawati River (6.5 km.) in South
16.	Water Demand and Supply source	4.0 KLD, Supply of Bore well
17.	Seismic Zone	Zone – II
18.	Method of mining	Opencast, Manual/Semi-mechanized
19.	Sources of water	Nearby dugwell /borewells or private tankers.
20.	Solid Waste	Temporary labour, s from nearby villages are hired, no generation of solid waste is generated due to proposed project activity.

Topography

The mining lease area is a small hillock or mound shaped topography with surrounded by agricultural land. The highest elevation of the land is near Ramp of the crusher area about 571 mtrs MSL and lowest 565 mtrs MSL at western side of the area. The elevation starts from the western side and gradually goes on rising in the eastern direction. The average soil/murrum cover is about 1.0m thick on the horizontal flat land and is yellow in colour.

REGIONAL AND GEOLOGICAL SETTING

Regional Geology

Meso - Neoproterozoic cover sediments in the Bastar Craton in Chhattisgarh and marginal parts of Orissa State are exposed in a number of isolated basins, viz., the Chhattisgarh, Indravati, Sabri, Pairi (Khariar) and Ampani. The constituent sediments in these basins, comprising conglomerate-arkose-arenite-siltstone, shale-limestone and dolomite show similar litho-association. However, sequences differ in thickness from basin to basin as well as in relative proportions of different rock types. According to some workers, these basins of various shapes and sizes are remnants of a single master basin (Pascoe, 1973; Ball, 1877;

Walker, 1900; Crookshank, 1963; Dutt, 1964; Schnitzer, 1967 and1970; Murti, 1996). Some other workers propose that these basins evolved in several isolated occurrences with well defined structural boundaries and are unique in character, content and duration.

The 'Indravati Basin', covering an area of 9000 sq. km of Bastar Province, exposes Late Proterozoic cover sediments in Jagdalpur plateau region. It is characterised by sandstone, shale, limestone and stromatolitic dolomite. The basin is mainly confined in Bastar district of Chhattisgarh and Koraput district of Orissa. The sedimentary sequence rests non- conformably on the Archaean Granitic Complex.

This group has been divided into Tiratgarh, Cherakur, Kanger and Jagdalpur formations in the ascending order. The Tiratgarh Formation comprises basal conglomerate, sub-arkose, and ortho-quartzite. The Cherakur Formation is represented by shales, whereas the Kanger Formation consists of grey laminated limestone, which gradually passes into shale above. The JagdalpurFormation consists of basal purple shale, greenish grey and purple cryptocrystalline limestone and dolomite (both stromatolitic and non-stromatolitic) and purple shale with thin intercalations of purple limestone and upper shale with quartzite intercalations.

Indravati Group is nearly flat showing sub-horizontaldips at places. The beds show overall centripetal dips. Towards eastern margin of the basin, the rocks show structural disturbance with tight folds showing axial plane trending 30°-70°. Basin is dissected by numerous normal faults. The southern margin is characterised by en-echelon faults. The major Sirisgura fault has dissected and laterally shifted the western margin of the basin. It is a steep hinge fault with side oriented northward thrown down, which increases to about 150m in the west from the hinge zone near Sirisgura. The basalt formations of the Indravati Group have been correlated with the Chandrapur Group and upper two formations with the Raipur Group of the main Chhattisgarh Basin.

GEOLOGY IN BRIEF: **Stratigraphic classification of Indravati Basin** (after Ramakrishnan, 1987)

Group	Formation	Rock Type
Indravati Group	Jagadalpur Formation (200m)	Purple shale with purple and grey stromatolitic dolomite (Machkot Dolomite Member), Purple limestone and shale
	Kanger Limestone (150 – 200 m)	Grey limestone
	Cherakur Formation	Purple shale with arkosi sandstone, chert pebble, conglomerate, grit
	Tirathgarh Formation	Quartz arenite (Chitrakot Sandstone Member) Subarkose and conglomerate (Mendri Member)
Unconformity		
Granite and Supra-crustal		

Local Geology

Geology of the area: The Tikanpal limestone deposit belongs to Jagadalpur Formation constituting "Indravati Group". The limestones is flaggy in nature, predominantly greyish in colour and yield a prolific development of stromatolites. The Tikanpal limestone consists of fine to medium grained, purple with mottled appearance.

Group	Formation	Rock Type
Indravati Group	Jagadalpur Formation (200m)	Purple shale with purple and grey stromatolitic dolomite (Machkot Dolomite Member), Purple limestone and shale

Limestone: Limestone is fine grained, hard compact, light gray to brown, essentially constituted of mineral calcite occurring in concentric rings and semicircular bands alternately placed with layers of ground mass interspersed with iron oxides and clay material. This structure is manifested due to the presence of stromatolites. Specific gravity is about 2.5, hardness is about 3 and three perfect sets of cleavage are present.

The thickness of limestone is about 5m to 6m in the existing mining pit and total thickness of the limestone is about 17 m as per the drilled bore hole log. The strike direction is about east-west and dip direction is about 2^0 towards west.

The bulk density of the limestone is not determined in the field, but the bulk density is assume as per observation of the physical propertied of the limestone rock samples such as sp. Gravity is low, medium and heavy. The bulk density value 2.5 is taken as per past miningexperience.

Soil/murrum: - Very small quantity of red soil/murrum occurs above the limestone, the thickness of this soil is about 0.5m to 1.0 m (av. 1.0m)

Structure of the area: The Tikanpal limestone is almost revealing a low dip of 2º towards north-east at places. There is no tectonic disturbance. The general strike of limestone is E- W with dip varying from horizontal to 2^0 towards north-east.

MINING

The method of quarrying will be open-cast under the category "B" using jack hammer along with compressor for drilling and subsequent blasting and after blasting excavation by manually using crowbar, spade and Kudali then manual loading into Tractor trolley /Tipper combination. Details given in **Table 10-3**

The top soil (average thickness – 1.0m) will be excavated by crowbar, spade & kudali, loading through bucket and transported by Tractor at non mining zone along with the mining lease boundary. The 5% of the mineral reject during the sizing and these losses will be blend with size material and some material used for the road maintained, so that no waste and sub-grade is generated during plan period.

LAND USE PATTERN

The proposed project site area is mainly land with or without scrub and agriculture land. Out of total project site area mostly contains agricultural land. Project Site Land-use Map and Pie-diagram showing land-use classification of the project site is given in **Figure 3.9 and Figure 3.10.** Site photographs are given in **Annex VIII.** The land-use classification of the project area is given in **Table 10-4**.

Table 10-4: Land-use Classification of the Project Area

Land-use Classification	Area in Hectare	Area in %
Settlement	2681	8.38
Water body	465	1.45
Sandy area	75	0.23
Forest	5756	18.00
Agriculture Land	18774	58.70
Mining Area	45	0.14
Open Scrub	3021	9.45
Plantation	1164	3.65
Total	31982	100.00

Source: SOI Toposheet and Satellite Imagery of Project Area, Landsat LISS-III SatelliteImagery, Google earth Inc., USA

ANALYSIS OF ALTERNATIVES

In the proposed project, an opencast mining will be carried out. For that, no other methodology is going to be changed, depending upon the geological set up, strata of the rock, boulders and its structural behavior. So, all the parameters of EIA/ EMP will be implemented as per the open cast mining.

DESCRIPTION OF ENVIRONMENT

Mining activities invariably affect the existing environmental status of the site. It has both adverse and beneficial effects. To maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components.

Baseline data collection/generation forms a part of the Environmental Impact Assessment (EIA) study and helps to evaluate the predicted impacts on the various environmental attributes in the study area by using scientifically developed and widely accepted environmental impact assessment methodologies. Baseline data is also required in preparing an Environmental Management Plan (EMP) outlining the measures for improving the environment quality and scope of future expansions for environmentally sustainable development.

This section contains the description of baseline studies of the 10 km radius of the area surrounding "Tikanpal Mine". The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potentialimpacts of the project can be assessed.
Baseline data was generated for various environmental parameters including air, water (surface and ground water), land and soil, ecology and socio-economic status to determine quality of the prevailing environmental settings. The study was conducted during Pre- monsoon (Oct- Dec 2021,) season.
The baseline data for environmental parameters were collected as per standard Terms of Reference for the relevant category of the project. The data was also authenticated or validated from the secondary data collected from regarding departments of agencies

The maximum temperature recorded during the study period was 43.3°C in the month of May and the minimum temperature was 15.3°C in the month of March. The highest RH found in the study area was 85.0% in the month of May, while minimum monthly average RH found 44.0 % in the month of March.

The average wind speed recorded was 2.3 m/sec.

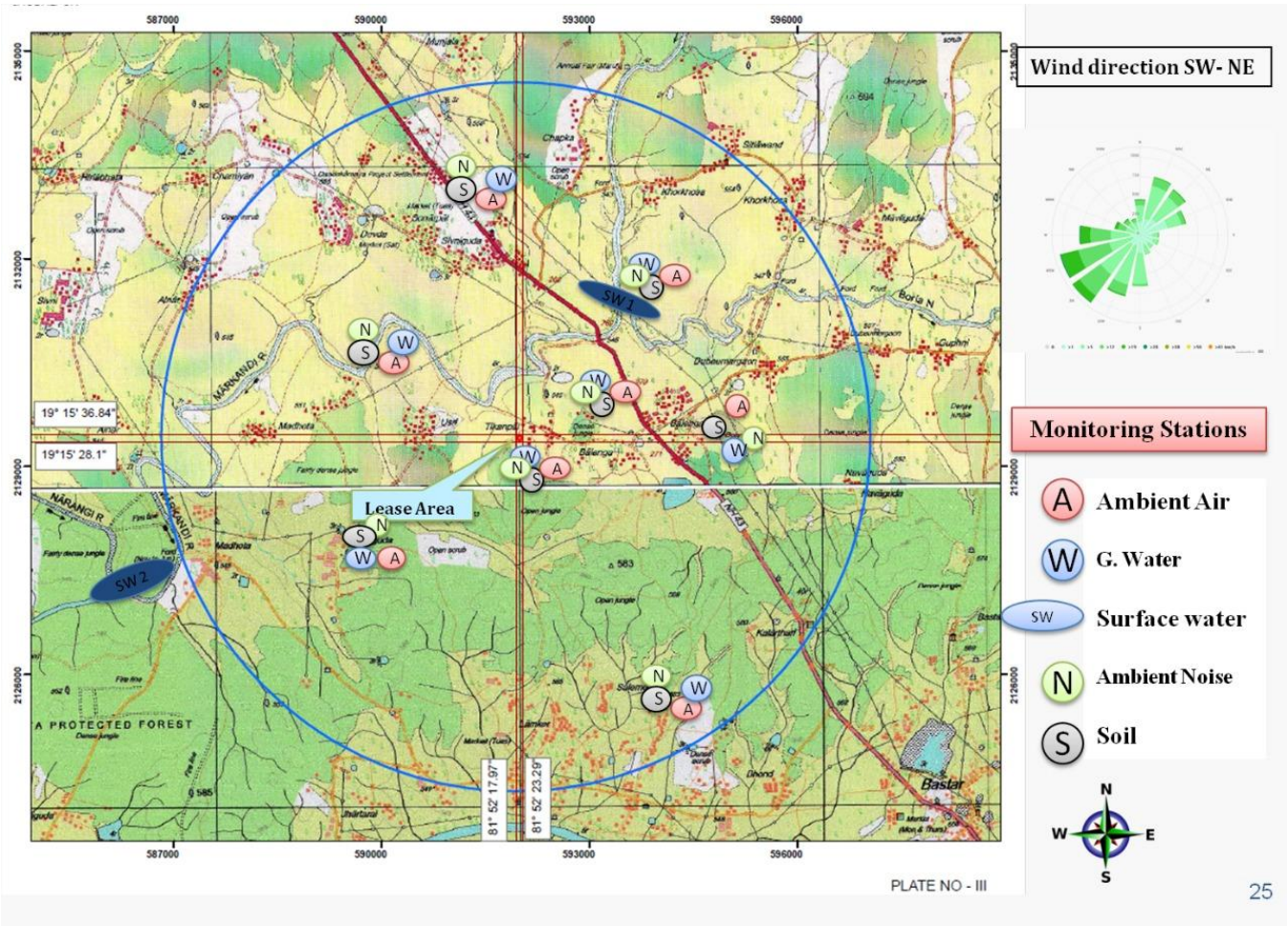
Wind rose diagram (**Figure 3.16**) from the monitored data shows that the predominant wind direction during the study period was mainly South West followed by South.

Air Environment

Eight Ambient Air Quality Monitoring (AAQM) Stations were selected. Criteria used for designing the network were principally governed by the wind rose pattern for Pre monsoon seasons and the accessibility of the selected sites. Attempts were made to locate most of the AAQ stations in predominant downwind direction with respect to the project site.

The tables show the highest P98 values of PM10, PM2.5 SO_2 and NOx during the study periods.

Location Code	Station Name	Distance and Direction from the lease area		Latitude	Longitude
AQ1	Project Site	00	--	19°15'28.01"N	81°52'23.16"E
AQ2	Madhota	SW	3.0	19°14'10.89"N	81°50'50.34"E
AQ3	Madhota II	W	3.25	19°15'46.08"N	81°50'30.61"E
AQ4	Duby umargaon	NE	1.50	19°15'59.39"N	81°53'6.16"E
AQ5	Balenga	NE	2.25	19°16'13.93"N	81°53'24.99"E
AQ6	Balenga II	E	3.50	19°15'35.28"N	81°54'22.79"E
AQ7	Manjla	N	4.50	19°17'46.20"N	81°51'36.04"E
AQ8	SAlemata	S	5.00	19°13'12.59"N	81°53'36.13"E



Baseline Interpretation

S. No.	Parameters	Baseline Status
1.	Particulate Matter (PM10 & PM2.5)	The particulate matters size not greater than 10 µm in diameter is collectively referred to as PM10. Due to their small sizes, PM10 can be inhaled readily and can penetrate deep into the human body. In study area particulate matter 10 varying from 66.4 µg/m^3 to 94.9 µg/m^3. PM2.5 was observed 27.0 µg/m^3 to 39.9 µg/m^3. Overall particulate matter was observed below to the NAAQS standards of 100 µg/m^3 60 µg/m^3 respectively. Area has normal traffic and situated between some dense open jungles. Due to natural richness and low density of population, it has good air quality.
2.	Gaseous	The source of SO2 in the study area is mainly from burning fuels

S. No.	Parameters	Baseline Status
	Pollutants (SO_2, NO_x & CO)	containing sulphur or emissions from biomass depending on the sulphur content in the material. Other anthropogenic sources are high vehicular moment. The primary sources of NO_2 in the study area are motor vehicles, electric utilities and residential sources that burn fuels. SO_2 was varying from 10.8 µg/m^3 to 14.9 µg/m^3 & NO_x was observed 15.3 µg/m^3 to 18.3 µg/m^3) in study area. CO was observed from 0.89 mg/m^3 to 1.25 mg/m^3 in study area. All the parameters are complying to the standards as defined by CPCB.
Overall, air quality was good in the area and only vehicular and mining emission activities are the major source of the particulate matter and gaseous emission.		

Noise Environment

Eight noise monitoring locations were selected. The Sound Pressure Level recorded during the daytime on all locations varies from 48.1 dB(A) to 53.6 dB(A) and during night-time varying from 33.1 dB(A) to 36.2 dB(A). The noise level was found well within prescribed standards due to absence of any major noise generating activities in the area.

Water EnvironmentGround water:

Four surface and six ground water samples were collected for analyzing the water quality of the study area.

The permanent hardness of water is typically given in one of three types of measurements: grains per gallon, milligrams per liter (mg/L), or parts per million (ppm) of "calcium carbonate" in the water. Since calcium carbonate has a mw of 100 g/mole the equivalents ofcalcium carbonate would be:

g $CaCO_3$=100 g/ mole × ([Ca^{2+}] + [Mg^{2+}])

where [Ca2+] [Ca2+] is the molarity of calcium and [Mg2+] is the molarity of magnesium. So, in the sense of molarity, calcium and magnesium are equal. However, you could also measure calcium and magnesium as mass of the cation per volume in which case

mass of $CaCO_3$=2.5 × (mass of Ca^{2+}) + 4.1 × (mass of Mg^{2+})

So, in the sense of the mass of cations, then 1 g/l of magnesium is harder than 1 g/l of calcium.

The physical parameters were meeting to the acceptable limits of drinking water as TDS was varying from 658 mg/l to 849 mg/l. Other physical parameters as pH, Na, K are also complying to acceptable limit of drinking water standard 10500:2012. Hardness in the water may be because of the presence of lime in the earth. The chemical parameters were

analyzed as alkalinity, calcium, hardness, chloride, Sulphate, fluoride and nitrate etc. all the parameters were meeting to the acceptable limits of drinking water standards IS 10500:2012 at all locations. The heavy metals were also analyzed, only metals were detected as iron & zinc which was meeting to the acceptable limits of drinking water standard 10500:2012 and other metals were below to the detection limits of laboratory. Overall the ground water quality was good to drink.

Surface water:

The physical parameters were analyzed as turbidity, pH, TDS, Na and K. The chemical parameters were analyzed for Alkalinity, Total Hardness, Calcium, Magnesium, Chloride, Bicarbonate, Sulphate, Nitrate, Fluoride, DO and COD were analyzed. Dissolved oxygen was Drinking water source after conventional treatment and disinfection or suitable for outdoor bathing as per CPCB criteria. BOD was observed below Class E as per CPCB water quality criteria.The heavy metals were also analyzed in the surface water. Only iron & zinc were detected. Other parameters were below to the detection limits. Total coliform was meeting to the Class C of water quality criteria as defined by CPCB.

Soil Analysis Report

Soil samples has been collected from 6 locations. As per district brochure and area surveyed, Agriculture is practiced in the area during kharif and Rabi season every year. During the Kharif, cultivation is done through rainfall while during the Rabi season, it is done through ground water as well as partly through surface water like ponds and other sources. The groundwater abstraction structures are generally Dug wells, Bore wells /tube wells. The principal crops in the block are Paddy, Wheat and Gram. The soil quality is very good as are was mostly loamy which is good for cropping and root development.

The pH was ranges 7.19 to 7.80 which was neutral to moderately alkaline as per ICAR guideline. The conductivity was varying from 122.1 µmhos/cm to 191.1 µmhos/cm in the study area which is meeting

to average soil quality. The organic carbon of the study area was an average sufficient to more than sufficient (0.93%) to (3.02 %). Nitrogen was observed varying from 116.5 kg/ha to 362.1 kg/ha which is good to sufficient for crop growth. Phosphorous was variable in study area as the quality was very less to medium in the soil. The potash content was very low in terms of fertility. Overall the soil quality was good having the good bulk density, porosity and infiltration rate.

Water Requirement

The total water requirement in the project area of the limestone Mine is about 4.0 KLD.The water is used in the following purpose and it will be met through Ground water.

- For dust suppression;
- For domestic consumption;
- For greenbelt development;

IMPACT ASSESSMENT

Air Environment

In opencast mining the different process of handling and transportation of minerals in the mining activities are prone to generation of high levels of fugitive dust that may increase the levels of particulate matters to high extent. Dusts are likely to generate due to the followingmining processes:

- Blasting
- Generation of dust due to transportation of minerals
- Generation of dust due to movement of heavy vehicles

The effects of air pollutants upon receptors are influenced by concentrations of pollutants and their dispersion in the atmosphere. Air quality modelling is an important tool for prediction, planning and evaluation of air pollution control activities besides identifying the requirements for emission control to meet the regulatory standards. It was found that after mines operation the resultant Ground Level Concentration for Particulate Matters will be below the stipulated standards. The efficient management of air quality requires the use of modelling techniques to analyze the patterns of pollutant concentrations from many individual sources of air pollutants operating simultaneously.

Mitigation measures:

Noise Environment

The impact due to blasting noise in the nearest habitation from the mine site not going to be significant, as the time duration for which the noise level is going to rise is very limited, i.e. up to a few seconds in the whole day.

Mitigation Measures:

- Proper maintenance of equipment
- Dense plantation to act as acoustic barriers
- Blasting parameters to be suitably set to reduce ground vibrations
- Equipment to be sealed with acoustic enclosure

Water Environment

There is not toxic element in and around the applied area. Hence contamination of any nature is not expected for surface or any ground water source.

Ecology

There are no Wildlife Sanctuaries or National Parks or Tiger Reserve within 15 km radius of the project site. The impact on terrestrial ecology would be due to emission of gaseous pollutant like NO_2 due to transportation activities. Adequate dust control measures would be taken to control dust emissions. Moreover, as described in air quality section above, the

contribution of PM, NO_2 and SO_2 due to mine operation will result in the AAQ to remain within the AAQ standards. The existing mining lease area is government revenue land. Lease area does not have any habitation of rare or vulnerable species. To control emissions, dense plantation will be carried out in the mine lease area as well as in the along the haul roads.

Impact on Socio-economic

The mining activity will generate socio-economic benefits to the people. In mining activity number of

skilled and unskilled workers are employed which generate direct or indirect employment. Additional facilities such as medical, educational, and infrastructural development will also take place under CSR activities. While assessing the socio-economic and sociological impact it has been noticed that economic level and living standard ofpeople will generally increase.

ENVIRONMENT MONITORING PLAN

Usually an impact assessment study is carried over short period of time and the data cannot bring out all variations induced by the natural or human activities. Therefore, regular monitoring program for environmental parameters is essential to take into account the changes in the environment. The objective of monitoring is:

- To verify the result of the impact assessment study in particular with regard to newdevelopments;
- To follow the trend of parameters which have been identified as critical;
- To check or assess the efficiency of the controlling measures;
- To ensure that new parameters, other than those identified in the impact assessmentstudy, do not become critical through the commissioning of new installations
- To check assumption made with regard to the development and to detect deviationsin order to initiate necessary measures; and
- To establish a data base for future impact assessment studies for new projects.

RISK ASSESSMENT & HAZARD

The components associated with risk and hazard in a mining case include blasting, overburden, heavy machinery and explosive storage. Measures to reduce and avoid any incidents occurring from the above mentioned components are already planned and will be implemented as soon as the mine starts commissioning. This includes measures to avoid accidents during blasting, due to storage of overburden and due to trucks and dumpers. The project does not involve storage of any chemicals or explosives and therefore risk associated with storage is not considered.

PROJECT BENEFITS

- Improvement in physical infrastructure

- Improvement in Social Infrastructure
- Employment Potential
- Company will undertake awareness program and community activities like health,camps, medical aids, family welfare camps,

ENVIRONMENT MANAGEMENT PLAN

The mining activities involve, dozing, excavation, loading, haulage and transportation of OB and ore. These activities lead to generation of air borne dust, which can cause air pollution in and around the mining lease area, if appropriate control measures are not taken. Similarly mining causes Land Degradation, Noise and Water Pollution etc. in the area.

The Environmental Management Plan (EMP) is a site specific plan developed based on the base line environmental status, mining methodology and environmental impact assessment. In order to minimize impacts of mining on different environmental parameters and to keep air and water quality within prescribed limits of CPCB, a Environmental Management Plan (EMP) is prepared to strictly follow it. The environmental management plan includes all measures and safety precautions necessary for safe mining along with rehabilitation measures for mined out areas.

It is necessary to include the environmental cost as a part of the budgetary cost component. The project authorities propose to undertake the following environmental works to achieve the environmental quality as desired.

The mine will be supervised and controlled by an independent Mines Manager supported by adequate team of technically and statutorily qualified personnel apart from the operating staff of skilled, semi-skilled, unskilled and other categories.

This Environment Cell is responsible for the management and implementation of the environmental control measures. Basically, this department shall supervise the monitoring of environmental pollution levels viz. ambient air quality, water and effluent quality, noise level either departmentally or by appointing external agencies wherever necessary.

The working conditions in the mines are governed by the enactments of the Director General of Mines Safety (DGMS). As per the guidelines of the Mines Act, the management will take all necessary precautions. Normal sanitary facilities will be provided within the lease area. The management will

carry out periodic health check-up of workers.

A well-defined environmental monitoring program would be emphasized with trained and qualified staff that would monitor the ambient air to ensure that the pollutants level is maintained always within the permissible levels. The locations will be finalized in consultation with SPCB.

Social Environment

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within the lease area or in the vicinity. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated.

The impact of mining activity in the area is positive on the socio-economic environment of the region. ***The negative impact will be limited to some sporadic health problems, which may occur due to increase in fugitive emission in the vicinity of the mines.*** The Project area of Limestone mine is providing employment to local population and it will be give preference to the local people whenever there is requirement of man power.

10.14. CONCLUSION

As discussed, it is safe to say that the proposed facilities are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigate technique, as well as to serve as biological indicators for the pollutants released from the premises of “Tikanpal limestone Mine”.