Online Proposal No SIA/CG/MIN/463376/2024

EXECUTIVE SUMMARY OF DRAFT ENVIRONMENT IMPACT ASSESSMENT REPORT FOR Proposed Laladhurwa-Jognipali Limestone Block

Production Capacity: Limestone - 3654413.97 TPA, OB/Waste 554058.50 TPA; (Total Handling: 4208472.47 TPA, excluding top soil 116224.80 m^3 per annum) along with installation of 700 TPH Crusher

Location: At Village- Laladhurwa, Jognipali, Kapisda, Sarsara & Dhaurabhatha, Tehsil- Sarangarh, District- Sarangarh - Bilaigarh (Earlier Raigarh), State- Chhattisgarh

Mine Area 200.902Ha.

FOR PUBLIC HEARING

Applicable Schedule: Category- 'B'
(Under 1(a) of EIA Notification Dated 14.09.2006)

SUBMITTED BY

M/s Green Sustainable Manufacturing Pvt. Ltd.

Project Proponent- Mukesh Dalmia (Director)

Registered Address- Plot No. 176/476 Sub Plot, AMSB Infra, Begunia, Dhumuduma Bhubaneswar, Khordha, Orissa-751019

PREPARED BY

PARIVESH ENVIRONMENTAL ENGINEERING SERVICES
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ENVIRONMENTAL CONSULTANT

PARIVESH ENVIRONMENTAL ENGINEERING SERVICES, LUCKNOW

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EXECUTIVE SUMMARY

1.0 INTRODUCTION

Green Sustainable Manufacturing Pvt. Ltd. has proposed Laladhurwa- Jognipali Limestone Block Mine for Limestone production capacity - 3654413.97 TPA, OB/Waste 554058.50 TPA; (Total Handling: 4208472.47 TPA, excluding top soil-116224.8 m^3 per annum); along with 700 TPH Crusher, which is spread over an area 200.902 Ha. falling in Village- Laladhurwa, Jognipali, Kapisda, Sarsara & Dhaura-bhatha, Tehsil- Sarangarh, District- Sarangarh- Bilaigarh (Earlier Raigarh), State of Chhattisgarh. Mine was allocated through auction process on dated 24-11-2022. Green Sustainable Manufacturing Pvt. Ltd. received a Letter of Intent (LOI) from the Office of the Mineral Resource Department, Chhattisgarh, vide letter no. F3-20/2022/12 Nawa, Raipur, dated 11.09.2023. The LOI was granted over an area of 200.902 Ha., valid for a period of three years from the date of issuance.

As per Environmental Impact Assessment Notification dated 14th September 2006 and subsequent amendments thereof, the proposed project activity is listed at schedule no 1(a) Mining of Minerals. The overall project activity is categorized as Category "B"; therefore, it will require Environmental Clearance (EC) to be obtained from SEIAA, Chhattisgarh.

The project proponents have submitted prescribed application along with Pre-Feasibility Report to the SEIAA, Chhattisgarh. TOR for the said project was accorded after appraisal in the 544th SEAC-2 Meeting held during 19.11.2024 (Agenda Item No. 7) by State Environment Impact Assessment Authority (SEIAA), Chhattisgarh) Vide letter no. OL/TOR/MIN/BILAIGARH_SARANGARH/3307 dated 22.12.2024 to carry out the EIA study.

Parivesh Environmental Engineering Services, Lucknow, is QCI-NABET accredited in Category "A" environment consultant organization has been assigned to undertake an Environmental Impact Assessment (EIA) study and preparation of Environment Management Plan (EMP) for various environmental components, which may be affected due to the impacts arising out of the proposed project.

1.1 Production capacity

Table E1: Proposed production during Plan Period

S. No.	Year	Pit ID	Total topsoil Volume (m^3)	Total Over Burden Volume (m^3)	Total Over Burden Quantity (t)	Total ROM Volume (m^3)	Total ROM Quantity (t)	Total Handling (t)
1.	Year-1	1	116224.8	166404.93	401035.90	539941.46	1501037.25	1902073.15
2.	Year-2	1	63487.98	268286.18	646569.70	988367.27	2747661.01	3394230.71
3.	Year-3	1	114510.0	229899.79	554058.50	1314537.40	3654413.97	4208472.47
4.	Year-4	1	26508.24	142178.34	342649.80	1266094.04	3519741.44	3862391.24
5.	Year-5	1	19623.14	182789.94	440523.75	1267127.02	3522613.12	3963136.87
Total			**340354.16**	**989559.18**	**2384837.65**	**5376067.19**	**14945466.79**	**17330304.44**

1.2 Location and accessibility

The proposed mine is situated at Village- Laladhurwa, Jognipali, Kapisda, Sarsara & Dhaurabhatha, Tehsil- Sarangarh, District- Sarangarh- Bilaigarh (Earlier Raigarh), State of Chhattisgarh. The project site falls on Survey of India Toposheet OSM No. F44R2. The Geographical Position of the Mining Lease Boundary Pillars is given in **Table E-2.**

Table E-2: Coordinates of the area of all major corner points

Pillars	Latitude(N)	Longitude(E)
1.	21°40'9.37947"N	83°10'54.63880"E
2.	21°40'9.23393"N	83°11'5.34817"E
3.	21°40'0.44394"N	83°11'5.18916"E
4.	21°39'56.58327"N	83°11'1.01399"E
5.	21°39'52.49894"N	83°11'0.94502"E
6.	21°39'49.93844"N	83°10'58.17350"E
7.	21°39'33.57546"N	83°10'57.87814"E
8.	21°39'33.43238"N	83°11'10.93111"E
9.	21°39'37.19856"N	83°11'10.88314"E
10.	21°39'52.45910"N	83°11'22.07598"E
11.	21°40'7.38693"N	83°11'27.67899"E
12.	21°40'8.39301"N	83°11'27.69185"E
13.	21°40'8.498787"N	83°11'58.52065"E
14.	21°40'7.96099"N	83°11'59.33483"E
15.	21°40'8.35288"N	83°11'59.61643"E
16.	21°40'8.35167"N	83°12'0.42731"E
17.	21°40'8.46493"N	83°12'0.46327"E
18.	21°40'8.46221"N	83°12'0.69730"E
19.	21°40'3.16199"N	83°12'0.61474"E
20.	21°39'56.40050"N	83°11'56.39847"E
21.	21°39'46.76307"N	83°11'40.60672"E
22.	21°39'46.22681"N	83°11'35.57614"E
23.	21°39'38.47376"N	83°11'21.94472"E

24.	21°39'23.57342"N	83°11'21.74760"E
25.	21°39'18.46707"N	83°11'13.21188"E
26.	21°39'8.70875"N	83°10'59.82092"E
27.	21°39'8.84492"N	83°10'50.02888"E
28.	21°39'10.95305"N	83°10'50.09341"E
29.	21°39'11.15072"N	83°10'36.35590"E
30.	21°39'32.77855"N	83°10'36.67536"E
31.	21°39'32.69236"N	83°10'43.63541"E
32.	21°39'46.77983"N	83°10'43.85097"E
33.	21°39'59.67171"N	83°10'51.65526"E
34.	21°39'59.63544"N	83°10'54.48259"E

The following is the environmental setting within the 10 Km. radius of the plant site:

Table E-3: Environmental settings within 10 Km. radius of the plant site

S. No.	Particulars	Details		
1.	Nearest Villages	**Village**		**Distance & Direction**
		Joganpali- Village		At mine site
2.	Nearest City/ Town	Chandrapur- ~ 5.6 km in NE Direction		
3.	Nearest Railway Station	**Particulars**	**Distance (km)**	**Direction**
		Kirodimal Nagar Railway Station	31.0	NNE
4.	Nearest State Highway/ National Highway	NH- 153	1.0	NW
5.	Nearest Airport	Raigarh airport	32.08	NE
6.	Archaeological Important Places	None within 10 km radius of study area.		
7.	Reserved/ Protected Forest/ Notified Areas within 10 km radius	Damka Protected Forest	0.25	E
		Devtongri PF	~4.3	E
8.	Wildlife sanctuary	Gomarda	8.25	S
9.	Nearest River / water body	Lath Nala	0.1	E
		Ghoghra Nala	3.8	S
		Jamri Nala	11.2	WNW
		Mand River	6.4	NE
		Mahanadi River	4.0	N
10.	Nearest Interstate Boundary	None within 10 km radius of study area.		
11.	Seismic Zone	III (Moderate Intensity Zone)		
12.	Nearest Health Services / Education Facilities/temples	**S. No**	**Hospital Name**	**Distance (km)**	**Direction**
		1	Ware Hospital, Hirri	2.74	W
		2	Ware Clinic, Hirri	4.39	W
		3	Primary Health Center, Godam	1.44	W
		4	Primary Health Center, Suwatal	3.87	W
		5	Primary Health Center, Bhedwan	6.90	WNW
		6	Primary Health Center, Hardi	7.53	WSW

		7	Primary Health Centre, Chandrapur	6.14	NE
		8	Government Hospital, Chandrapur	6.2	NE

S. No.	School & Collage Name	Distance (km)	Direction
1	Govt. Primary school Jognipali	-	-
2	Gov. Primary school kariganthi	6.75	ESE
3	Govt. Primary School Morauni	7.94	NE
4	Eklavya Public School Redha	8.57	SW
5	Gov. Primary & Higher Secondary School Naurangpur	3.17	SW
6	Govt Primary School Bhauradadar	9.21	W
7	Chandrahasini Vidyapeeth - A CBSE Affiliated School secondary schools Morauni	7.91	NNE
8	Govt. Higher Secondary School Gudeli	0.79	N
9	Govt.High School, Banjari	0.85	NW
10	Govt High school, Godam	1.49	W
11	CPM Arts & Science College	10.4	SW
12	Government Naveen College	7.8	NE

2.0 PROJECT DESCRIPTION

As per Environmental Impact Assessment Notification dated 14th September, 2006 and subsequent amendment thereof, the proposed Mine project falls under S. No. 1 (a) under category "B" and requires Environmental Clearance (EC) to be obtained from SEIAA, Chhattisgarh.

Mine was allocated through auction process on dated 24-11-2022. Green Sustainable Manufacturing Pvt. Ltd. received a Letter of Intent (LOI) from the Office of the Mineral Resource Department, Chhattisgarh, vide letter no. F3-20/2022/12 Nawa, Raipur, dated

11.09.2023. The LOI was granted over an area of 200.902 Ha., valid for a period of three years from the date of issuance.

Out of the total area (200.902 ha), Govt. land having non-Forest land -5.092Ha. and Forest land -6.298Ha. & Private land is 189.509Ha.

Proposed project cost is 268.0Cr.

2.1Raw Material Requirement

No raw material is required for the mining.

2.2 Method of Mining

Open Cast Mining

Working will be done by opencast conventional fully mechanized method of mining which includes drilling, blasting, loading, transportation, unloading and crushing. A crusher along with screening facility of 700 TPH capacities is to be installed at mine site. Mineral transportation will be done through road.

The salient features of mining method are: -

- Mining operations envisaged system of bench forming involving deep hole drilling & blasting. The quarry will be developed at different levels. The maximum height of the benches will be kept at 06 m and the width of the working benches will more than 6 m.
- Haulage roads at 1:16 gradient will be maintained for easy movement of machinery and transport vehicles.
- Hydraulic drills will be used for drilling. Diameter of the blast hole drill will be 104 mm.
- Controlled blasting will be in practice. Blasting will be done by using cast booster and ammonium nitrate fuel oil mixture and slurry/emulsion explosives in watery holes as a column charge for charging of blast holes. NONEL latest technology and delay detonators will be practiced.
- Use of rock breaker for secondary breaking of boulders eliminating secondary blasting.
- Material will be loaded by excavator and sent to proposed crusher (700TPH) by dumper.
- ROM/Crushed materials will be transported to the end users.

2.3 Power Requirement & Supply

Total energy Consumption (KWh) 500.0. Power will be met from State Electricity Board/ Grid. About 0.65 to 0.70 Liters diesel against per ton of limestone, will be required.

2.4Water Requirement

The total water required, is approximately **150KLD.**The break up with its uses is given below. Ground water and rain water collected in mine sump as and when developed. Permission has been obtained from CGWA vide letter no CGWA/NOC/MIN/ORIG/2024/20764 dated 17.09.2024 for 150 m3/day ground water abstraction.

Table-E-4: Water Consumption

Particulars	Water Requirement (KLD)	Source
Drinking water	18	Ground water
Water Sprinkling on Mine haulage Roads	90	Water required for mining activity will initially be met from ground water and once the mine pits will be developed, mine water will be used.
Miscellaneous	4	
Vehicle & Equipment's	18	
Greenbelt	20	
Total	**150**	

2.5 Project cost

The project cost of the project is estimated as Rs. 268 Crores.

2.6 Land Requirement

The over an area of 200.902 Ha. Forest land is involved in the proposed ML area.

Table E -5: Land Details

Village Name	Government Land		Private Land	Grand Total
	Non Forest	Forest		
Dhaurabhatha	1.748	0.477	77.204	79.429
Jognipali	0.35	2.745	26.957	30.055
Kapisda	0.000	0.00	3.546	3.546
Laladhurwa	2.84	3.076	65.152	71.068

Sarsara	0.154	0.00	16.650	16.804
Grand Total	**5.092**	**6.298**	**189.509**	**200.902**

The land use and breakup details are presented in **Table-E- 6.**

Table.E-6: Land Area Breakup

S. No.	Particular	Present Land use in (Ha.)	End of 5th year Land use in (Ha.)	Conceptual/ lease period land use in (Ha.)
1.	Total excavation (Area under Mining)	1.18	26.45	154.20
a.	Backfilled	0.00		15.0
b.	Water Reservoir	0.00		139.20 ha. (Out of total excavated area will be water reservoir)
2	Topsoil stacking	0.00	4.25	0.0
3	Overburden/Waste Dumping	0.00	9.91	0.0
4	Mineral Storage	0.00	0.88	0.0
5	Infrastructure (Workshop, Administrative Building etc.)	0.07	0.26	3.0
6	Roads	0.71	1.88	
7	Tailing pond	0.00	0.04	
8	Effluent treatment Plant	0.00	0.0	
9.	Plantation (Along the road, near soil storage)	0.00	0.0	22.76 (on Undisturbed area)
10.	Other	0.00	0.36	
11.	Undisturbed area	198.942	156.872	20.942
Total		**200.902**	**200.902**	**200.902**
**As Per Approved Mining Plan*				

2.7 Employment Generation (Direct & Indirect) Due to the Project.

The proposed mine project will generate direct employment for around 107 people. Preference will be given to suitable local people for employment. Apart from the direct employment, there will be many indirect employment opportunities after commencing of the proposed mine project in the nearby villages.

2.8 Key pollution concerns

S. No	Source	Mitigation measure
1.	Fugitive dust and SOx, NOx due to excavation, drilling,	• Avoid blasting or drilling will be done in windy day.

	blasting loading, unloading, transportation	• Water sprinkling will be done on periodically to arrest the dust on haul road, mineral stack, overburden stack. • Mineral will be transported by covering with tarpaulin. • Reduce the speed, check the load limit and force overwrite loading • Mask will be provided to workers as safety.
2.	Noise due to drilling, blasting, transportation, use of heavy machinery	Delay blasting, sharp drill will be used. Earmuff will be provided to mine workers
3.	Water	No waste water will be discharged outside the mine area.
4.	Soil	Top soil will be stored at designated place and water sprinkling will be done to reduce the dust generation.

3.0 DESCRIPTION OF BASELINE ENVIRONMENT

Baseline data was generated during winter season from December, 2023 January 2024-February, 2024. Baseline environmental studies were conducted at project site along with 10 km radial distance from the mine site. Baseline environmental quality data for various environmental component like Air, Noise, Water, Land, Biological Environment and Socio-Economic were collected.

A. Air Quality

Ambient air quality was monitored for $PM_{2.5}$, PM_{10}, SO_2, NO_x & CO at 12 stations including mine site. The following are the concentrations of various parameters at the monitoring stations:

Table E-7: AAQ DATA SUMMARY

Parameter	Concentration
PM_{10}	45.6 µg/m³ to 78.7 µg/m³
$PM_{2.5}$	25.3 µg/m³ to 47.8 µg/m³
SO_2	6.1 µg/m³ to 19.8µg/m³
NO_2	10.3 µg/m³ to 30.7 µg/m³
CO	235 µg/m³ to 1175 µg/m³

B. Surface Water Quality

Seven water samples have been considered in the study area. The analysis results are presented below are in accordance with BIS -2296 standards: -

- pH of the surface water samples collected was in the range of 7.02– 8.0
- The Total dissolved solids in the samples were in the range of 170-324 mg/l.
- Total Hardness in the samples were in the range of 130-385mg/l.
- Chlorides concentration was found to be in the range of 60.2-102 mg/l.
- Total Coliforms Organism MPN/100ml -185-255
- Dissolved oxygen (DO) found in range of 4.2-7.8 mg/l
- Biochemical Oxygen Demand (3 days at 27°C) – 2.4 to 4.3 mg/l
- COD ranges from 7.8 -90 mg/l.
- all the samples were found to be well within the limits.

C. Ground Water Quality

8 Nos. of ground water samples from open wells / bore wells were collected from the nearby villages to assess ground water quality impacts and analyzed for various Physico-Chemical parameters. The analysis of samples shows that all the parameters are in accordance with BIS: 10500 specifications.

- pH of the ground water samples collected was in the range of 7.1– 8.1
- Total Dissolved Solids in the samples was in the range of 260-280 mg/l
- Total hardness was found to be in the range of 162-168 mg/l.
- Chlorides concentration was found to vary between 30-36 mg/l.
- The fluoride concentration was found to be in the range of 0.1 – 0.5mg/l.
- Sulphate was found in the range of 8-11 mg/l.
- Heavy metal concentrations in all the samples were found to be well within the limits.

D. Noise Quality

The Maximum Noise (day) value was observed 60.5 dB(A) and the minimum noise (day) value was observed 43.0 dB(A). The Maximum Noise (night) value was observed 51.8 dB(A) and the minimum noise (night) valve was observed 37.3dB(A).

E. Soil Environment

- pH is found to be neutral 7.2 – 7.8 in reaction. Based on the pH values, soil nature in the study area is found to be neutral to slightly alkaline.

- The bulk density of the soil in the study area ranged between 1.14-1.35 gm/cm which indicates favourable physical condition for plant growth.
- As based on result of available concentration of major nutrients fertility status of soil with respect to NPK value is found to be in the range of 207.2– 263.1 kg/ha (better), 33.4-44.5 kg/ha (sufficient) and 90.4-106.8 kg/ha (Better) respectively.
- Organic carbon was found in the range of 0.58% – 0.74%.

F. Biological Environment

- Total 205 plant species were observed in the study area
- There are no Notified National Parks, Biosphere Reserves, Migratory Corridors of Wild animals, except wildlife sanctuary and protected forests within the 10 Km buffer zone.
- Gomarda Wildlife Sanctuary is about 8.25 km in South direction. Company is in process of getting clearance from National Board for Wildlife.
- Schedule – I faunal species are found in the 10 km radial study area of the mine site. (1) Leopard (*Panthera pardus*), (2) Jungle Cat (*Felis Chaus*), (3) Striped Hyaena (*Hyaena Hyaena*), (4) Jackal (*Canis aureus*), (5) Indian Fox/Bengal Fox (*Vulpes bengalensis),* (6) Sloth Bear (*Melusus arsinus*), (7) Gaur (*Bos gourus*), (8) Sambar (*Cervus unicolor*), (9) Indian Porcupine (*Hystrix Indica*), (10) Indian Charmeleon (*Chameleon Zeylanicus*), (11) Indian Python (*Python molurus*).
- No endangered species of flora and fauna is found in the study area.

G. Socio Economy

- Total Population of the villages in the Study area (10 Km radius) is 165929
- Female Sex Ratio (No. of females per 1000 Males) is 1011
- Literacy, 61.87% population of sarangarh tehsil is literate, out of which 71.78% males and 52.07% females are literate.
- Schedule Caste (SC) constitutes 13.14 % while Schedule Tribe (ST) were 6.44 % of total population in Sarangarh (NP)

H. Land Use Land Cover Classification

The Land Cover classes and their coverage are summarized below:

S. No.	LU/LC Class	Area (Ha.)	% of area
1.	Settlement	2703.04	6.973
2.	Plantation	465.12	1.199

3.	Sand area	1071.34	2.764
4.	Forest	5765.52	14.873
5.	Water Bodies	2829.24	7.298
6.	Stone Quarry	190.43	0.492
7.	Open Scrub	1621.18	4.182
8.	Agricultural land	24120.46	62.219
Total Study area		**38766.95**	**100**

4.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Prediction of impacts on air quality

The likely emissions from the proposed project are PM_{10}, $PM_{2.5}$, SO_2 and NOx. In the present case, predictions of Ground level concentrations have been carried out using ISCST -3 model.

The incremental GLC values of PM_{10}, $PM_{2.5}$, SO_2 and NOx, CO around the project site is presented as isopleths in Chapter**-4.**

Table -E-8: Net Resultant Maximum Concentrations

Item	PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)
Maximum baseline conc. in the study area	78.7	47.8	30.7	19.7
Maximum predicted incremental rise in concentration due to proposed Mining block (Area Sources)	4.88	2.44	6.67	2.66
Maximum predicted incremental rise in concentration due to proposed Crusher (Point Sources)	0.61	0.38	-	-
Net resultant concentrations during operation of the proposed project	84.19	50.62	37.37	22.36
National Ambient Air Quality Standards	100	60	80	80
The net resultant Ground level concentrations during operation of the proposed project are within the NAAQS. Hence, there will not be any adverse impact on air environment due to the proposed project.				

The net resultant Ground level concentrations during operation of the project are within the NAAQS. Hence there will not be any adverse impact on air environment due to the proposed project.

B. Prediction of impacts on Noise quality

The major sources of noise generation in the proposed project will be mining HEMM machinery, Blasting and drilling etc. The ambient noise levels will be within the standards prescribed by MoEF&CC i.e. the noise levels will be less than 75 dBA during day time and less than 70 dBA during night time. 22.76 ha of land is envisaged for greenbelt out of the total 200.902ha will be developed for green area. Hence, there will not be any adverse impact due to noise on population in surrounding areas due to the proposed project.

C. Prediction of impacts on Water Environment

No waste water will be generated from the mining activity. Sewage waste water will be diverted to Septic tank followed by soak pit. No adverse impact is envisaged.

D. Prediction of impacts Socio - Economic Environment

There will be certain upliftment in socio economic status of the people in the area & development of the area due to the proposed mine project.

Due to this the economic conditions, the educational and medical standards of the people living in the study area will certainly move upwards which will result in overall economic development, improvement in general aesthetic environment and increase in business opportunities.

E. Prediction of Impacts on Land Environment

The land use of the lease area will be altered from Govt land as well as agricultural land to mining area including pits, temporary dumps, greenbelt etc but will not have any significant effect on the surface features of the surrounding areas. At the conceptual stage of mining, out of the total mining lease area (i.e. 200.902 ha), total mined-out area will be around 154.20 ha, out of which, 15 ha area will be reclaimed with plantation and remaining 139.20 ha area will be converted into water reservoir, 3.0 ha area will continue to be covered under utility services. Plantation will be done on 22.76 ha area. Green belt will be done on 0.66 ha area on 7.5 m safety zone of lease boundary. Hence, there will not be any adverse impact on land environment due to the proposed mine project.

F. Biological Environment

There is Gomarda Wildlife Sanctuary is about 8.25 km in South direction from the proposed mine site. Company is in process of getting clearance from NBWL, Work order has been placed to consultant. Mining lease is spread over an extent of 200.902 Ha.out that 22.76-hectare area will be used for greenbelt development. Approx 56900 nos. of trees will be planted.

5.0 ENVIRONMENTAL MONITORING PROGRAM

Environmental Management Cell (EMC) will be set up to undertake routine environmental monitoring. Monitoring will be done to ensure compliance with the prescribed laws and standards. The Head of EMC will report to the Mine Manager. Qualified staff will be recruited in EMC. Environmental monitoring of ambient air, stack emission, fugitive dust emission, noise levels, groundwater quality, surface water quality and soils will be carried out as per norms.

Table- E-9: Environmental Monitoring Programme

S. No.	Particulars	Frequency of monitoring	Duration	Parameters required to be monitored
1.	Ambient Air quality	24 hourly twice a week	Continuously 24 Hourly	PM_{10}, $PM_{2.5}$, SO_2, NO_X and CO etc. as per CPCB/ MoEF&CC Guidelines
2.	Noise	Once in a season (24 hours monitoring on hourly basis)	Once in a season 24 hours with 1-hour interval	Equivalent noise level-dB (A)
3.	Water quality	Once in a season	Grab sampling	pH, Temperature, Turbidity, Magnesium Hardness, Total Alkalinity, Chloride, Sulphate, Nitrate, Fluoride, Sodium, Potassium, Salinity, Total Nitrogen, Total Phosphorous, Total coli forms, faecal coli forms etc.
4.	Greenbelt	-	-	Number of plantation (Units), Number of Survived plants/ trees, Number of poor plants/ Trees
5.	Environmental	Once in year	-	With Respect to

	Audit			Environment Clearance, Consent conditions and ISO 140001.
6.	Health	Occupational health	Initial Medical Examination (IME) and Periodic Medical Examination – Once in a five year as per Mines Rules, 1955. For Silicosis – Once in five years.	--

6.0 ADDITIONAL STUDIES

Rehabilitation and Resettlement is involved in the proposed Mine project. Hence, R & R study has been carried out. The land acquisition will be done as per The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013

Risk Assessment:

Risk analysis is the systematic study of uncertainties and risks encountered in various areas. Risk analysts seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. It also defines and analyzes the dangers to individuals, businesses and government agencies posed by potential natural and human-caused adverse events.

The following types of hazards are identified during the Limestone mining operations: -

- Fall of machinery/ person from benches
- Failure of transport machinery
- Heavy rainfall resulting in inundation of mine
- Accidents due to blasting/explosives
- Accidents due to fire
- From Electric line through the area

- Road accidents

  Following procedure will be followed for effective management of any disaster in the mine.

  Step 1: Identification of Disaster risk.

  Step 2: Identification of persons at risk

  Step 3: Removal of Hazard

  Step 4: Evaluation of the risk

  Step 5: Control measures to be taken

  Step 6: Maintain Assessment records

  Step 7: Review

  The assessment of risk in the proposed mine has been estimated and corresponding mitigation measures are suggested in the EIA/EMP report.

Public Consultation

Public hearing will be conducted as per EIA notification 2006 and subsequent amendments.

7.0 PROJECT BENEFITS

Limestone mining will generate substantial revenue for the state of Chhattisgarh, through optimal utilization of natural resource and royalty. The project will boost the infrastructure development of the area.

107 people will be employed in the proposed mine projects and additional many more indirect (100nos) employments. All the labour/manpower will be hired from the local places. CSR activities will be done as per rules of Government of India. The Budgetary provision will be made as per norms.

8.0 ENVIRONMENTAL MANAGEMENT PLAN

A. Air Environment

Dust is the main pollutant generated during various mining operations, including blasting, haul roads, loading and vehicular movement.

The following are air emission control systems proposed in the proposed project:

S. No	Source	Mitigation measure

1.	Fugitive dust and SOx, NOx due to excavation, drilling, blasting loading, unloading, transportation	• Avoid blasting or drilling will be done in windy day. • Water sprinkling will be done on periodically to arrest the dust on haul road, mineral stack, overburden stack. • Regular maintenance of vehicles and equipment will be carried out. • Wet drilling and controlled blasting (using latest NONEL technology) will be adopted • Mineral will be transported by covering with tarpaulin. • Reduce the speed, check the load limit and force overwrite loading • Mask will be provided to workers as safety. • Greenbelt will be developed

Dust Suppression System

Water sprinklers will be provided at haul road and other dust prone area. Dust suppression system will be provided with plain water - comprising of piping network, valves, pumps, instrumentation & control, water tank etc.

Haul Roads

All internal roads will be graded to prevent the fugitive dust emission due to vehicular movement.

B. Water Environment

The surface runoff generated during rainfall event will be diverted to mined out pits inside the mine premises. This will act as rainwater harvesting structure. Garland drains with sedimentation pits at appropriate intervals will be made around the overburden dump. Runoff from dump slopes will be passed through befell plates filters to arrest the silt before letting it to the pits. Gully along the slopes will be provided with (Befell plates) to arrest the silt. The slopes will be compacted routinely, soil will be spread over it and stabilized by planting hers and shrubs. This will prevent soil and silt erosion. Domestic wastewater will be treated in septic tanks and disposed in soak pits. Water available in the mined-out pit and active pits will be tested. There will be no discharge of wastewater outside the mine premises.

C. Noise Environment

Major noise-generating source will be deployed HEMM machinery, material handling, movement of vehicles, drilling and blasting for mining and transportation of mineral. The proposed equipment of the proposed project would be designed for noise levels not exceeding 75 dB (A). In general, the following methods will be adopted to control the noise pollution.

- Material handling operations and movement of vehicles will be properly scheduled to minimize noise.
- Maintenance program for heavy vehicles will be routinely followed.
- Non-electric delay detonator will be used to minimize the ground vibrations.
- The noise levels will be confined to the working zones of the mining.
- Workers working inside crusher house will be given ear plugs and ear muffs.
- Community noise levels are not likely to be affected due to the proposed thick green belt and attenuation due to the physical barriers.
- The ambient noise levels will be in accordance with MoEF&CC norms i.e. ambient noise levels will be < 75 dBA during daytime and < 70 dBA during night time.

D. Land Environment

Reclamation by back filling in the mined-out 7.5 m. safety barrier area has been proposed in the 1-year. However, during the plan period top layer of fertile soil shall be spread in the safety barrier zone and greenbelt shall be developed accordingly. The waste material dumps generated during the course mining shall be re handled for back filling part of the pit after excavation of total available mineral reserve of the ultimate pit during conceptual stage such that there will be water reservoirs of the mined-out area. This will cater the part of water requirement of villagers for agricultural purpose. Periodical testing of water will be carried out and necessary mitigate measures will be taken to maintain quality within the prescribed norms /guidelines. Part of topsoil stacked in the prescribed location shall be spread over the back filled area of the worked-out pit for development of "Green belt" and garden at the vicinity of the proposed water reservoir for the villagers.

Table: E -10 Summary of backfilling

Quantity of Waste / Fill Material Available at Site (m3)	4746.50
Availability of Top Soil for Spreading (m^3)	0.00
Proposed Spread Area (m^2)	0.00

Greenbelt will be developed in the safety barrier. Desirable beautification and landscaping practices will be followed. Hence there will not be any impact due to the proposed project.

Table E.11: Municipal Solid Waste Generation & Its Disposal

Type of Solid waste	Proposed (TPA)	Total (TPA)	Proposed method of disposal
Canteen waste (Biodegradable)	3.531	3.531	Used in composting / Vermiculture Used as manure for greenbelt development within the premises

E. Green Belt Development

Proposed mine is located over an extent of 200.902 Ha. out of this 22.76 Ha. will be developed as greenbelt. 56900 nos. plants will be planted. The following points will be considered for selection of plants species:

- Greenbelt absorbs both gaseous as well as particulate pollutants to a great extent. For absorbance of gases, the duration of the foliage should be longer.
- Characteristics of tree/plants including shapes of crowns considered necessary for effective removal of dust particles.
- Greenbelt/Plant species having good root system will be selected, so that soil erosion rates can be controlled significantly.

F. Cost for Environment Protection

Table E 12: Environment Management Plan Cost

S. No.	Particulars	Capital Cost (Rs. In Lacs)	Recurring Cost/ Annum (Rs. In Lacs)
I.	**Environmental Management Measures**		
	Water Pollution Control, Management & Conservation		
A.	Roof Top Rain Water Harvesting	10.0	0.5
B.	Oil and Grease trap at HEMM washing centre	5.0	0.5
C.	Others (Garland Drain, retaining walls, Settling tank etc.)	10.0	2.0
D.	Solid waste dump & stabilization management	9.0	1.0
II.	**Environmental Noise & Ground Vibration Management**		
i	Periodic maintenance of Equipment's, signage installation, weather cock, Noise	1.0	--

	barrier like green corridor and bund around sensitive receptor		
ii	Controlled blasting technique	10.0	1.0
III	**Air Pollution Control & Management**		
i	Bag dust collector at crusher and dry fog system at unloading hopper	30.0	3.0
ii	One water tanker for water sprinkling on haul roads.	12.0	5.0
IV.	**Ecological and Bio-diversity**		
i	Green Belt (Phase wise greenbelt development during course of mine)	633	82.0
V.	**Conservation Plan**		--
	Financial outlay for activities proposed in wildlife Conservation Plan of Schedule-I Species	20	
VI.	**Environmental Monitoring**	0.0	10.0
Total		**740**	**105.0**

9.0 Conclusion

The operation of mine lease has significant positive impact on the socio-economic environment of the area which helps for development of this area including further development of physical infrastructure facilities. In the interest of improve the social conditions of the local habitants this project should be allowed after considering all the environment aspects.

The region shall also be benefited from the project as there will be direct employment of people. Preference will be given to the people of the state possessing requisite skill and qualification criteria. Also, there will be lot of scope for indirect employment of the people of the state in and around the project site like in transportation sector.

In view of the above the proposed project of Green Sustainable Manufacturing Pvt. Ltd. is technically feasible and financially viable.

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