

EXECUTIVE SUMMARY

1.1 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) is a decision making tool, in the hands of the Authorities which brings forth the factual position about a project that enables them in arriving at an appropriate conclusion for the proposed projects, to retain them if environmentally sound, and reject if found having deleterious overall impact. EIA identifies the extent of the environmental, social and economic impacts of a project prior to decision-making. EIA systematically examines both beneficial and adverse impacts of the proposed project over and above the prevailing conditions of environmental parameters and ensure that these impacts are taken into account during the project designing stage itself and the values of the combined impacts are never allowed to exceed and remain within the statutory norms. This process has been envisioned and set in motion by the Ministry of Environment and Forests for sustainable development and the final decision is arrived at only, when those to whom it matters are made known of the salient features of the project being envisaged close to them and their opinion has been sought in a widely advertised Public Hearing Event under the chairmanship of the district authorities so that public could also express their opinion free, without favour and fear. Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Uttarakhand, under EIA Notification of the MoEF dated 19-8-2006, and its subsequent amendments and EIA Guidance Manual for Mining of Minerals of MoEF, Govt. of India, for seeking environmental clearance for mining of soapstone in the applied mining lease area measuring 2.231 ha. the Terms of Reference (TOR) received from SEAC vide Letter no. : 258/SEIAA dated 31 march, 2023 under EIA notification of the MoEF dated 14-9-2006, as amended on 1st Dec 2009 & 4th April 2011 of MoEF, Govt. of India, for seeking environmental clearance for applied mining lease area measuring above 5ha (individual or in cluster form) falling under category "B1". The lease of Surkhaligaon Soapstone Area at, Village- Surkhaligaon, Tehsil- Dungakuri, District: Bageshwar (Uttarakhand)

has applied application for lease of soapstone mineral measuring over an area of 2.231 ha. State Govt. has considered granting mining lease vide letter no. 2638/VII-A-40/Ba 2004 dated 07.12.2010. At the time of demarcation 2.231 ha considered for grant of mining lease. Likewise MoEF, GoI made prior Environmental Clearance mandatory under the notification, Sep 2006, as amended in 2009, 2012, 2016, mining projects with lease area of more than 5.0 ha of single lease or in 500m. cluster which total is more than The Environmental Impact Assessment report has been prepared in terms of EIA notification of the MoEF dated 14-9-2006, as amended on 1st Dec 2009, 4th April 2011 and the EIA Guideline Manual for Mining of Minerals (Feb, 2010) of MoEF, Govt. of India, for seeking environmental clearance for mining in the soapstone mining lease measuring 2.231 ha ha. falling under category B1 because of NGT recent order.

The proposed project is for mining of Soapstone from lease area and the estimated project cost is approx. Rs. 48.83 Lakhs. The mining lease has been granted to Surkaligaon Soapstone Mine

The proposed mining project is categorized as category 'B1' project. The EIA-EMP report is prepared as per the TOR granted under the EIA Notification. Based on the primary information documents been submitted and the presentation made before SEAC-Uttarakhand, the Authority prescribed & released the Terms of Reference (TOR) vide Letter No. Ref. No.: Letter no. : 317/SEIAA dated 29 August, 2023 under (attached as Annexure-I), for grant of EC consideration of the project. Further to assess the impact on environment due to proposed mine, 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.

1.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

Surkhaligaon Soapstone Mine at, Village- Surkhaligaon, Tehsil- Dungakuri, District: Bageshwar (Uttarakhand)

has applied mining lease for soapstone mineral. At the time of demarcation, 2.231 ha area was found suitable for mining lease & recommended to grant mining lease over an area of 2.231 ha. Lease period 25 Year.

Soapstone finds its uses in all aspects of life and commercial business. Soapstone has wide applications across various industries. Some uses for soapstone or talc are paper, textile, cosmetics, paint, ceramics, detergents, animal feed, insecticide, plastics and various drying powder. Soapstone, also known as Talc or Talcum Powder, is a mineral that is naturally found in nature. The chemical name for Talc or Talcum Powder is hydrated magnesium silicate. The region Uttarakhand accounts for 29% of India's soapstone production.

Proposed five year production target in Tables No. 1.1.

Years	Soil (Cum)			exploitation of soapstone (Tonnes)			Total exploitation of soapstone (Tonnes)	Interburden (Cum)		
	I	II	III	I	II	III		I	II	III
1 st year	385	271	32	5569	3737	377	9683	4998	3354	338
2 nd year	221	124	34	5974	3421	393	9788	5361	3070	353
3 rd year	188	112	22	6098	3487	606	10191	5472	3129	544
4 th year	236	135	0	6458	3619	608	10685	5797	3249	546
5 th year	251	140	35	7210	3630	665	11505	6472	3260	597
Total	1281	782	123	31309	17894	2649	51852	28100	16062	2378

The proposed mining project has been categorized as Category B1 project.

Proponent & Address:

SHRI THAKUR SINGH GARIYA

S/O MADAN SINGH GARIYA

R/O-VILLAGE: KIROLI, POST- KAFLI

TEHSIL & DISTT.-BAGESHWAR (U.K.)

10.2.1 Brief description of nature, size and location of the project:

Brief details of the project are described in the Table No. 10.2 given below:

S. No.	Parameters	Description
1.	Name of the Project	Surkhaligaon Soapstone Mine at, Village- Surkhaligaon, Tehsil- Dungakuri, District: Bageshwar (Uttarakhand)
2.	Location of the Project	Village- Surkhaligaon, Tehsil- Dungakuri, District: Bageshwar (Uttarakhand)
3.	Project Proponent	SHRI THAKUR SINGH GARIYA S/O MADAN SINGH GARIYA R/O-VILLAGE: KIROLI, POST- KAFLI TEHSIL & DISTT.-BAGESHWAR (U.K.)
4.	Lease Status	This is Progressive Mine Closure Plan of mining lease & State Govt. has given its consent to grant mining lease vide letter 1458 MUKHYA KANIZ/MA.PLA./T.C./47/BHU. KHANI. E./2015-16 Dated 22 Oct 2016 for a period of 25 years
5.	Topography of Mine lease area	Agriculture Land
6.	Location of the Project	
	Khasra no.	Attached in Approved Mine Plan
	Village	Surkaligaon
	Tehsil	Dugnakuri
	District	Bageshwar (u.k)
	State	Uttrakhand
7.	Total Lease Area	2.231 ha
8.	Category of the Project	"B1"
9.	Altitude of the Area	The topography of the area is cultivated field. The area has mild slope towards west directions. The river Punger is about 2.5km aerial distance from applied area & flows east to west directions locally called is gadhera dendritic pattern & first & second order exist western flank of

Executive Summary.

		applied area & flows north to south direction. Another seasonal drainage, second order semi dendritic in pattern flows from east to west direction & confluence to another drainages. The rain water of the area drain down the slope & contributed to gullies & drainages & it ultimately meet the river Pungur which is the main catchments of the area. The highest level of the area is 1700.50mRL towards eastern flank while the lowest level is recorded 1672.40mRL towards south west direction.			
10.	Toposheet No	530/13			
11.	Lease Area Coordinate		Pillar No	N	E
			Pillar No	Latitude	Longitude
			A.	29°54'51.90"N	79°57'16.74"E
			B.	29°54'53.01"N	79°57'17.61"E
			C.	29°54'53.07"N	79°57'18.55"E
			D.	29°54'52.06"N	79°57'19.05"E
			E.	29°54'52.21"N	79°57'20.15"E
			F.	29°54'53.33"N	79°57'21.51"E
			G.	29°54'53.27"N	79°57'22.10"E
			H.	29°54'52.13"N	79°57'22.66"E
			I.	29°54'50.28"N	79°57'22.05"E
			J.	29°54'49.57"N	79°57'22.25"E
			K.	29°54'48.90"N	79°57'21.97"E
			L.	29°54'47.72"N	79°57'20.20"E
			M.	29°54'48.02"N	79°57'19.63"E
			N.	29°54'48.18"N	79°57'18.00"E
			O.	29°54'48.51"N	79°57'17.95"E
			P.	29°54'48.75"N	79°57'17.43"E
			Q.	29°54'49.14"N	79°57'17.42"E
			R.	29°54'49.90"N	79°57'18.23"E
			S.	29°54'50.19"N	79°57'19.15"E
	T.	29°54'50.50"N	79°57'19.14"E		
	U.	29°54'49.71"N	79°57'17.51"E		
	V.	29°54'48.53"N	79°57'16.90"E		

Executive Summary.

			W.	29°54'48.08"N	79°57'16.09"E
			X.	29°54'47.94"N	79°57'16.19"E
			Y.	29°54'48.15"N	79°57'16.77"E
			Z.	29°54'47.71"N	79°57'17.25"E
			Z1	29°54'44.46"N	79°57'17.40"E
			Z2	29°54'47.73"N	79°57'14.62"E
			Z3	29°54'48.54"N	79°57'16.63"E
			Z4	29°54'49.74"N	79°57'17.35"E
			Z5	29°54'51.12"N	79°57'17.81"E
12.	Name of the Mineral Mining	Soapstone			
13.	Method of Mining	Opencast, Semi Mechanised			
14.	Total Geological Reserve	0.102031 Million Tonnes			
15.	Mineable Reserve	0.102031 Million Tonnes			
16.	Capacity of Production	Maximum production 11414 TPA			
17.	Operational days/ Year	240 Days			
18.	Total Water Requirement	5.36KLD of water will be used for the project site (Drinking use, Sprinkling & Plantation)			
19.	Source of Water	Potable tankers			
20.	Man power requirement	34 persons			
21.	Drilling / Blasting	No			
22.	Land utilization Pattern	-			
23.	Total Proposed Project Cost	Rs. 51.975 Lakhs			
24.	Proposed CER Cost	Rs. 2.59 Lakhs			
25.	EMP Expenditure	Rs 3.40 Lakhs			

Details of the Project

INTRODUCTION OF THE PROJECT/ PROJECT BACKGROUND

Name of project: Surkhaligaon Soapstone Area

Area: 2.231 Ha

Location of Project: Village- Surkhaligaon Tehsil- Dugnuri

District: Bageshwar (Uttarakhand),

Production : Maximum Production 11505 Tones per year

Name and address of the project proponent: SHRI THAKUR SINGH GARIYA

S/O MADAN SINGH GARIYA

R/O-VILLAGE: KIROLI, POST- KAFLI

TEHSIL & DISTT.-BAGESHWAR (U.K.)

Brief description of the nature of project:

This is Progressive Mine Closure Plan of mining lease & State Govt. has given its consent to grant mining lease vide letter 1458 MUKHYA KAHIZ/MA.PLA./T.C./47/BHU. KHANI. E./2015-16 Dated 22 Oct 2016 for a period of 25 years.

LOCATION PLAN

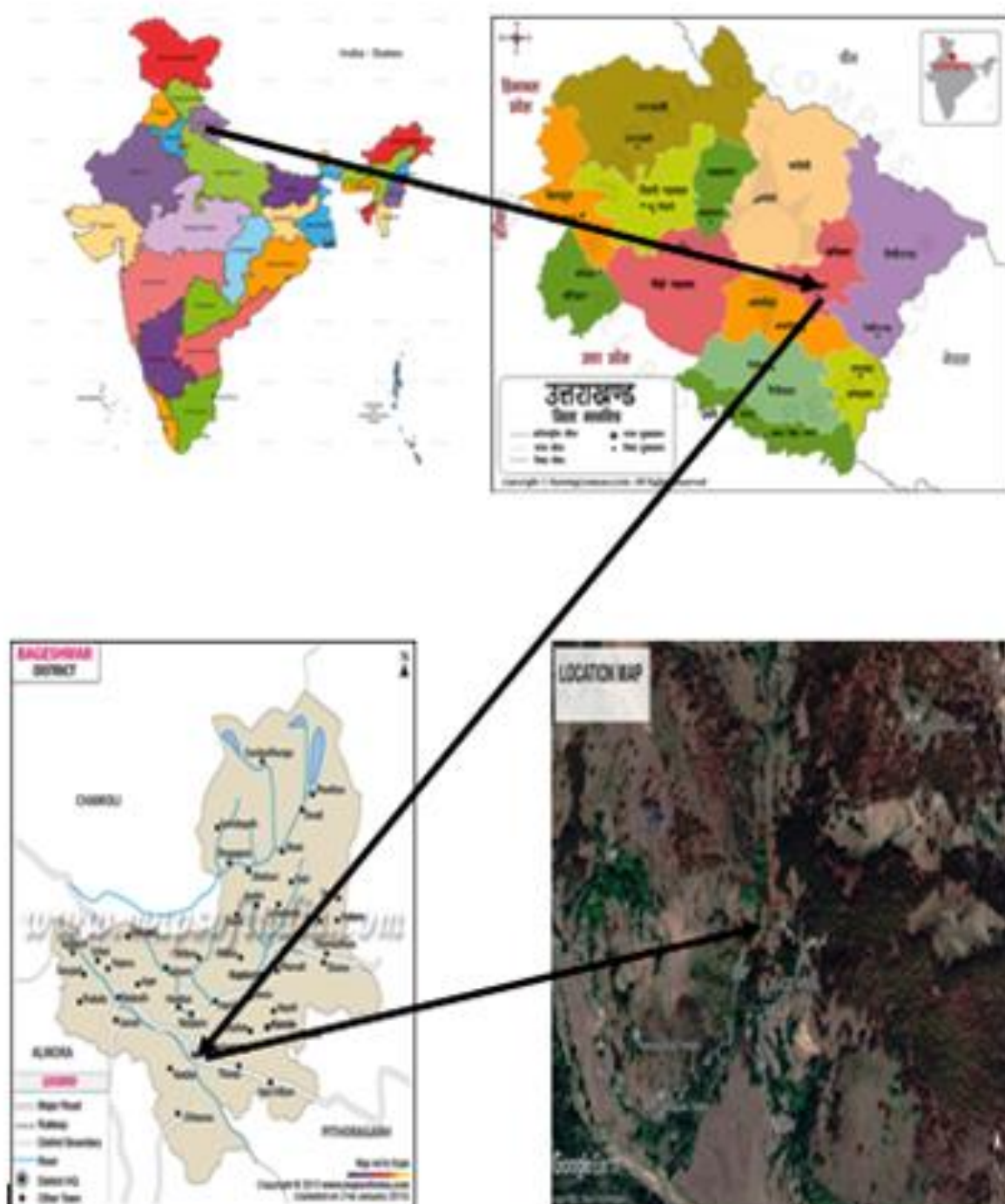


Figure: 1.1- Project Location

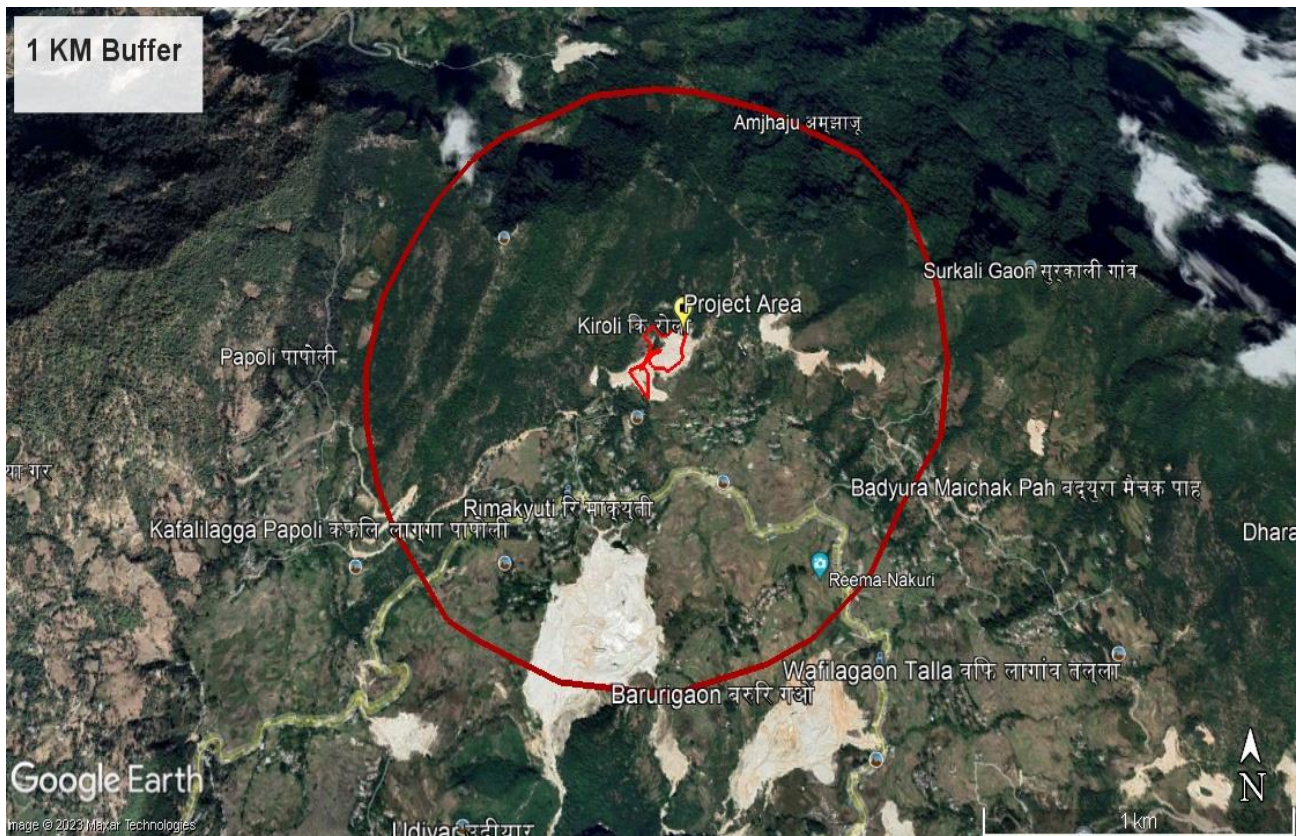


Figure: 1.3–Google Map Showing 1 km Radius of the Project

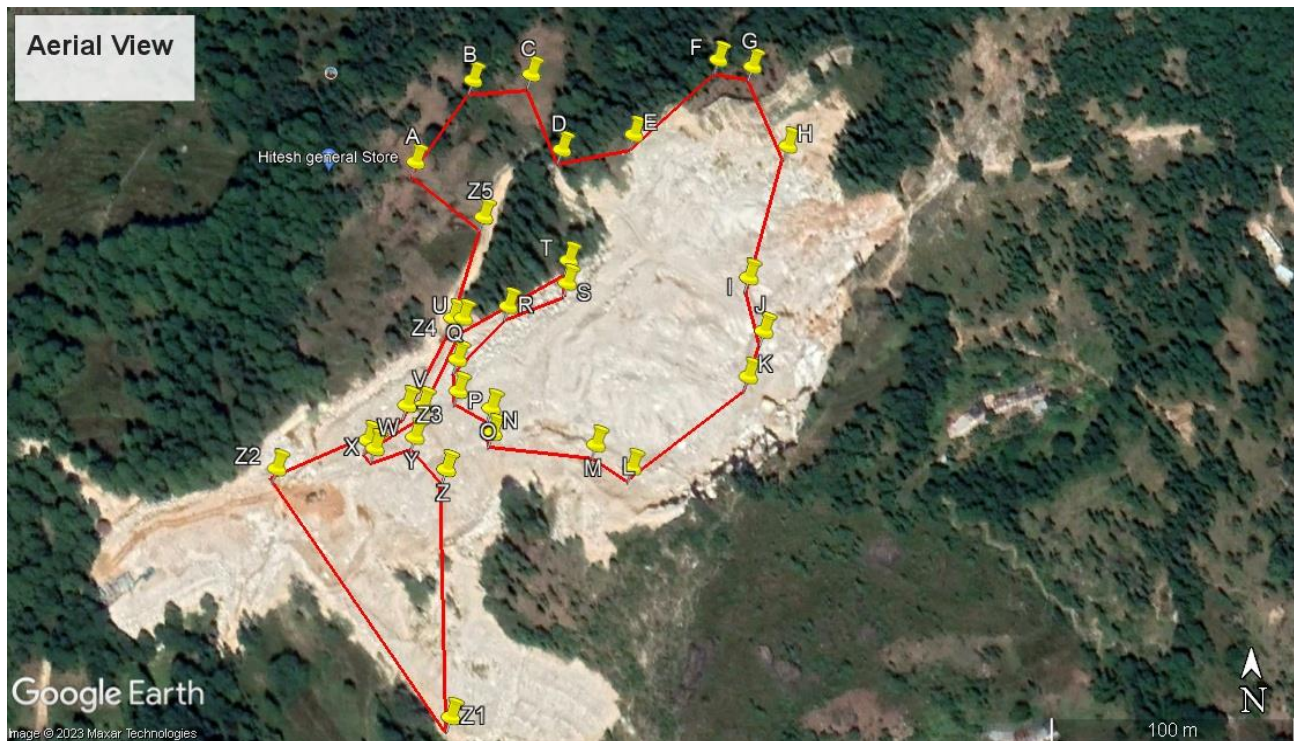


Figure 2: Google Earth showing Zoom View of the Project Site

1.3 STATUS OF REGULATORY CLEARANCES OF THE PROJECT

There is no National Park, Wildlife Sanctuary & National Monument, within core zone or 10 km radius of the ML area.

There is no legal issue against the project in the court of law.

MINE DEVELOPMENT AND PRODUCTION

The mining will be done mechanized way in open cast method in quite a systematic manner by forming 6m high benches. However, there may be minor variation in the width and- height which the lessee will keep on mending. The top soil and interburden to be scrapped with the help of JCB machine, dozer, shovels, pickaxe, spade & crowbar and will be stacked separately in dump yard located near the working pit. The developmental working will be done by construction of road/track to different working benches, removal of top soil and interburden. The soil will be filled into the bags, loaded on mules and unload into stockyard.

Anticipated Life of Mine:

As per present data the total proved reserves upto depth 1660mRL comes out 102031 tonnes & same has been considered as mineable reserves also with an envisaged rate of production of soapstone 11414 tonnes/annum at the end of fifth year, the anticipated life of mine comes out 9.0 year. With the proposed exploration in future, the mineable reserves may be enhanced & accordingly life of mine may be increased.

OPEN CAST MINING:

(i) Existing Method of Mining:

It is open cast mechanized mine. An excavator is being deployed for the removal of overburden & interburden. Soapstone is being exploited manually with conventional hand tools. Dressing, breaking, sorting & sizing is being carried out at pit the pit head & different grade of soapstone is filled in 50kg plastic bags, & transported manually/mules upto road head side. From PWD road, the soapstone bags located manually into trucks & transported Haldwani. Mining was carried out in one pit with formation of benches. The height of benches is kept 8m to 10m, width of benches is kept 5m with face slope 85deg. At present all the working pits have been backfilled/reclaimed.

Due to past mining area degraded by one mining pit & dimension of pit is as below:

Exploratory	Length (M)	Width (M)	Depth (M)	Thickness (M)	Lithology	Status
E1	120	92	10-12	10-12.0m	Soapstone bearing with low grade magnesite	Open

The broad parameters of working benches:

Item	Details				
i) Method of Mining	Mining operation has been proposed by mechanized open cast method.				
ii) Benches parameters	The broad parameters of working benches:				
Bench Height	8-10m				
Width	5.0m				
Haul road width	6.0m				
Bench slope	85deg				
Over all Pit slope	48deg				
Maximum depth of Mining pit due to past mining activities	In pit no. E110m to 12m (from 1697mRL to 1685mRL)				
Gradient of Haul Road	1:16				
Grid reference of existing working location	<table><tr><th>Pit name</th><th>Location</th></tr><tr><td>E1</td><td>In between local grid coordinates N1099to N1214& E1092 to E1202</td></tr></table>	Pit name	Location	E1	In between local grid coordinates N1099to N1214& E1092 to E1202
Pit name	Location				
E1	In between local grid coordinates N1099to N1214& E1092 to E1202				
Water table	No water table will be encountered due to proposed mining activities.				
Pumping of water	No water will accumulate in the mining pit therefore no such proposal has given for pumping water.				
Surface water management	Seasonal drainage passes within lease area & flows towards south & south-west direction. Mining activities are proposed far away from drainage & mining operations shall be temporarily suspended during monsoon period. During monsoon period all mining pits shall be backfilled, therefore there shall be no adverse impact on water on water regime. Few check dams are proposed across the drainage to settle down suspended solids if any. Cleaning of check dams & its maintenance shall be carried out regularly.				

(ii) Proposed method of Mining:

It will be open cast mechanized mine. Excavator shall be deployed for the removal of overburden & interburden. The waste (interburden) to be generated during course of mining shall be used in backfilled over mined out pit. Mining shall be carried out in one pit viz. pit I. The width of benches shall be kept 5m, height of benches shall be kept 7m with face slope 68°. The soapstone will be extracted manually with the help of crow bar, chisels, pickaxe, hammers, spade etc. Soapstone is soft mineral therefore no drilling & blasting shall be required. No further beneficiation will be required except breaking & sorting. The different grade of soapstone will be filled into 50 kg plastic bags & transported up to road side by manually. From road side the soapstone bags will be loaded into trucks through manually and transported to Haldwani.

The salient points of proposed method of mining are given below:-

Mining shall be carried out in one pit viz pit I. Bench height will be kept 5.0m width of benches shall be kept 7.0m with face slope 68°.

Development work will be construction of foot track to different working benches and removal of the top soil. Seasonal nalla & habitation are far away from proposed mining pits. Mined out pit shall be back filled before the commencement of monsoon therefore there shall be no adverse impact on habitation due to mining activities.

In future no mining & allied activities shall be carried out within 7.5m barrier zone. Gravity retaining walls having width & height 1.5m & 1.0m shall be provided at the base of waste dump.

All quantities of waste material to be generated each year shall be dumped within lease area secured with Gravity retaining wall.

The broad parameters of working benches:

Item	Details
i) Method of Mining	Mining operation has been proposed by mechanized open cast method.
ii) Benches parameters	The broad parameters of working benches:
Bench Height	5.0m
Width	7.0m
Haul road width	6.0m
Bench slope	68deg
Over all Pit slope	34deg
Overall depth of mine during plan period	24m
Gradient of Haul Road	1:16
Grid reference of proposed working location	Pit I will be in between local coordinates N1099 to N1215 & E1090 to E1202
Water table	No water table will be encountered due to proposed mining activities.
Pumping of water	No water will accumulate in the mining pit therefore no such proposal has been given for pumping water.
Surface water management	Seasonal drainage exists within the lease area & flows south east, direction. Mining activities are proposed far away from drainage & mining operations shall be temporarily suspended during monsoon period. During monsoon period all mining pits shall be backfilled, therefore there shall be no adverse impact on water on water regime.

Gravity retaining wall having width 1.5m & height 1.0m shall also be erected at the base of backfilled pit and at the base & side of dump.

The year wise schedule of completion of activities is as below:

Pit-I

Activities	2023-24	2024-25	2025-26	2026-27	2027-28
i) Gravity Retaining Wall at the base of dump	90m	To be Maintained	To be Maintained	To be Maintained	To be Maintained
ii) Gravity Retaining Wall at the sides of dump	50m	To be Maintained	To be Maintained	To be Maintained	To be Maintained
iii) Gravity Retaining wall at the base of backfilled pit	50m	50m	50m	50m	50m

(iii) Last five Year production Target & achievement:

Year	Proposed production as approved Mining Plan (Tonnes)	Production Achieved (tonnes)
2018-19	9683	3491.90
2019-20	9788	2670.00
2020-21	10191	12044.37
2021-22	10685	5046.00
2022-23	11505	7522.63
Total	51852	30774.9

Geotechnical Studies:-

Geotechnical Studies like slope failure, slip failure, rock failure etc. shall be carried out yearly. The retaining wall having proper shape & size shall be erected considering all technical parameters.

The width of benches shall kept 7m height of benches shall be kept 5.0m & slope of faces shall be kept 68°. Approach road having width 6.0m gradient 1:16 shall be provided to connect each mining faces. In Pit I, mining faces shall advance towards east & north east direction & alignment of faces by & large North South direction. Interburden to be generated from pit I during next five years shall be backfilled over mined out pit. Initially interburden will be filled in the mined out pit & lateral on soil shall be spread over it, to restore to its maximum original topography. After backfilling the mined out area shall be used for agriculture purpose. Therefore no proposal has been envisaged for separate dumping of waste material.

Extent of Mechanization:

Excavator shall be deployed to remove the interburden & dump on dumping ground. For the breaking of hard rock/boulders, rock breaker shall be used.

The make & model of excavator is as below:

Machinery	Bucket Capacity	Aron length	Boom length	No. of units
Excavator	1.5cum	2.85m	3mm	2 nos
Rock Breaker	1mtr length		Dia 6"	1 nos

Mining activities shall be carried out in one shift only & excavator/rock breaker shall be deployed from 8.0am to 5.0pm in day time.

Future proposal of mining is given in one pit and 0.562m² fresh area shall be broken due to mining pit during next five years & out of this 0.419m² area shall be backfilled/reclaimed.

Executive Summary.

The ultimate depression with respect to original topography shall be 2m to 2.5m.
0.157ha area shall be occupied by waste dump.

The total year wise quantities of soapstone & waste generated from Pit-I, is tabulated below:

YEAR	quantities of soapstone in (tonnes)	Waste (Cum)
2023-24	11132	6422
2024-25	11145	6430
2025-26	11178	6449
2026-27	11356	6552
2027-28	11414	6586
Total	56225	32439

(iv) Proposed four year production target:

The year wise production schedule of soapstone from different benches in different pits are given below:

Year (2023-24)

Bench Level (mRL)	Top Soil (m)	Bench Area (m2)		Face length (m)	Volume (Cum)			Quantities of Soapstone (Tonnes)	Total Waste (Cum)
		OB	SBS		t/s	OB	SBS		
1665	0	0	78	68	0	0	5304	5516	3182
1660	0	0	108	50	0	0	5400	5616	3240
							10704	11132	6422

Year (2024-25)

Bench Level (mRL)	Top Soil (m)	Bench Area (m2)		Face length (m)	Volume (Cum)			Quantities of Soapstone (Tonnes)	Total Waste (Cum)
		OB	SBS		t/s	OB	SBS		
1670	0	0	46	70	0	0	3220	3349	1932
1665	0	0	44	64	0	0	2816	2929	1690
1660	0	0	78	60	0	0	4680	4867	2808
Total							10706	11145	6430

Executive Summary.

Year (2025-26)

Bench Level (mRL)	Top Soil (m)	Bench Area (m2)		Face length (m)	Volume (Cum)			Quantities of Soapstone (Tonnes)	Total Waste (Cum)
		OB	SBS		t/s	OB	SBS		
1675	0	0	48	78	0	0	3744	3894	2246
1670	0	0	36	68	0	0	2448	2546	1469
1665	0	0	50	70	0	0	3500	3640	2100
1660	0	0	22	48	0	0	1056	1098	634
Total							10748	11178	6449

Year (2026-27)

Bench Level (mRL)	Top Soil (m)	Bench Area (m2)		Face length (m)	Volume (Cum)			Quantities of Soapstone (Tonnes)	Total Waste (Cum)
		OB	SBS		t/s	OB	SBS		
1675	0	0	50	78	0	0	3900	4056	2340
1670	0	0	38	70	0	0	2660	2766	1596
1665	0	0	50	68	0	0	3400	3536	2040
1660	0	0	24	40	0	0	960	998	576
Total							10920	11356	6552

Year (2027-28)

Bench Level (mRL)	Top Soil (m)	Bench Area (m2)		Face length (m)	Volume (Cum)			Quantities of Soapstone (Tonnes)	Total Waste (Cum)
		OB	SBS		t/s	OB	SBS		
1675	0	0	51	78	0	0	3978	4137	2387
1670	0	0	39	70	0	0	2730	2839	1638
1665	0	0	52	66	0	0	3432	3569	2059
1660	0	0	22	38	0	0	836	869	502
Total							10976	11414	6586

1.4IMPACT ON LAND USE & RECLAMATION OF MINED OUT AREAS

Opencast mining activities may alter the landscape of the lease area and also cause some disturbance to the surface features of the surrounding areas. Mining will be done after leaving 7.5 m safety barrier.Plantation will be developed in consultation with district administration/ local authority, wherever feasible.

Proposal for reclamation of land affected by mining activities:

The mining will commence from the higher levels and will advance towards lower levels. Intermittent backfilling will commence from the higher levels and subsequently advance towards the lower elevation so that terraced agriculture fields would undertake in such a manner that original land use will be restored i.e. before the onset of monsoon will be handed over to cultivators for cultivation. The final backfilling will be started once the ultimate benches are formed and pit reaches the optimum economic depth. All recovery of the mineral will be of the saleable grade.

Forest Land	Area (ha)	Non Forest Land	Area (ha)
Forest (specify) Area (ha)	Nil	(i) waste land,	Nil
		(ii) grazing land,	Nil
		(iii) Agriculture land,	2.165
		(iv) others (specify) Public Utility Land (lkoZtfud Hkwfe $\frac{1}{2}$)	0.066
Total	Nil		2.231

Plantation will be raised in 7.5m barrier zone along the boundaries of the mining lease area by planting the native species around ML area, backfilled and reclaimed area, around water body, roads etc. in consultation with the local DFO/Agriculture department.

1.5 LAND USE PATTERN

Presently (pre-mining), the land covered under the mine lease area is non-forest land.

1.6 BASELINE ENVIRONMENTAL STATUS

The baseline data has been collected at the project site and 10 km buffer zone for prominent environmental attributes like Ambient Air Quality, Ambient Noise Level, Water quality and Soil profile. Study area map is shown below in **Fig. 3.1**. Primary and Secondary data has also been collected for other environmental attributes for the preparation of EIA/EMP report. The baseline study for the project was conducted during January 2023 to March 2023 (pre Monsoon Season).

The baseline data monitoring procedures conform to the requirement of EIA Notification, 2006 (as amended on 14.09.2006). The monitoring and analysis was done through Noida Testing Laboratories, Gt-20, Sector -117, Noida- 201301 which is NABL accredited.

In order to get an idea about the existing state of the environment, various environmental attributes such as meteorology, air quality, water quality, soil quality, noise level, ecology and socio-economic environment have been studied/monitored.

EXECUTIVE SUMMARY

Meteorology

Meteorological data at the site was monitored during April 2023 to June 2023 representing pre- monsoon season.

Ambient Air Quality

Ambient air quality monitoring stations were selected primarily on the basis of surface influence, demographic influence and meteorological influence. From the meteorological data already available at the near-most site, the frequency and duration of wind is preliminary determined from which the likely wind rose diagram is first drawn. To assess the ambient air quality level, 5 monitoring stations were setup.

24 hourly monitoring was carried out for PM₁₀, PM_{2.5}, SO₂, NO₂ with the sampling frequency of twice a week at each station for a study period of 3 months (April to June 2023).

Water Quality

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per MoEF guidance. Hence quality of ground water was compared with IS: 10500: 2012 for drinking purposes. Surface water quality was analyzed for parameters as mentioned in the 'Methods of Monitoring & Analysis published by CPCB (in Annexure IV of CPCB guidelines)' and it was rated according to the CPCB Water Quality Criteria (Designated Best Use). Grab water samples were collected from sampling locations in a 5-liter plastic jerry can and 500 ml sterilized clean glass bottles for complete physico-chemical and bacteriological tests respectively. These samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part), IS: 1622-1981 reaff. 2003 and Standard Method for Examination of Water and Wastewater Ed. 23rd (2017), published jointly by APHA, AWWA and WEF.

As per the standard practice, one sample from each station was taken in the study period. Sampling was done by standard sampling technique as per the Standard Methods IS: 3025 (Revised Part), IS: 1622-1981 reaff. 2003. Necessary precautions were taken for preservation of samples.

Noise Levels

Noise is one of the most undesirable and unwanted by-products and may affect human health

EXECUTIVE SUMMARY

and wellbeing. It can cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure both the quality as well as the quantity of noise in and around the proposed site. The main sources of noise can be domestic activities, industrial activities and vehicular traffic.

The noise levels within the study area were recorded using Sound Level Meter and noise monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986.

Noise monitoring reveals that the maximum & minimum noise levels at day time were recorded as 65.5 dB (A) at NQ-1 & 43.55 dB (A) at NQ-11 respectively. The maximum & minimum noise levels at night time were found to be 58.6 dB (A) at NQ-1 & 32.85 dB (A) at NQ-11 respectively.

There are several other sources in the 10 km radius of study area, which contributes to the local noise level of the area. Traffic activities as well as activities in nearby villages and agricultural fields add to the ambient noise level of the area.

Ecological Environment-

There are no wildlife sanctuaries and National Parks within the study area of 10-km radius.

1.7 ANTICIPATED ENVIRONMENTAL IMPACTS

Impact on Air Quality

Soapstone mine where PM₁₀ and PM_{2.5} will be the main pollutants generated in mining activities. The emissions of Sulphur dioxide (SO₂), Nitrogen Oxide (NO₂) contributed by diesel operated equipment and vehicles movement were considered marginal as branded make and vehicles with PUC certificate will be operated only. Fugitive dust and particulates are major pollutants occurred in the mining activities. Fugitive emissions will be settled by 70- 80% by use of multiple water sprinklers. Prediction of impacts on air environment will be made with proposed production and net increase in PM₁₀ and PM_{2.5} emissions at the proposed site and at the 10 km radius of study area due to mining activities.

Air pollution sources in the operating mine was classified into two categories

- i. Loading and unloading of mineral and OB, IB

EXECUTIVE SUMMARY

ii. Transportation on the haul road

Impact on Water Resources Surface Water Resources

The topography of the area will not be largely changed in view of the proposed concurrent reclamation. During the mining activity period, there is a possibility of mixing of freshly disturbed material with the rain water. To take care of such happenings, retaining walls have been provided along the backfilled pits and along the soil and interburden dumps.

Groundwater Resources

The water table in hills is usually very deep and does not have any relevance with mining activities. However, concurrent restoration to original topography will not be disturbing the percolating water.

Impact on Water Quality

The impact on water quality will be confined to increased suspended solids during rain. The dumps will be secured with toe walls and rainy water will not carry significant suspended material.

Impact on Noise Levels and Ground Vibrations

With the mining operations, due to the deployment of machinery, operation for mine development, excavation and transportation of soapstone, it is imperative that noise levels would increase. It is also observed that these incremental noise levels will not significantly affect the existing ambient noise levels.

Impact on Soil

Soil may be defined as a thin layer of earth's crust, and support medium for the growth of plants. The soil characteristics include both physical and chemical properties. The soil survey and soil samples were carried out / collected to assess the soil characteristics of the study area. Soil samples were collected from 5 locations (project site, one upstream & one downstream side) as shown in **Table 3.4(i)** and analyzed as per CPCB norms. **Fig.3.7** showing the soil

EXECUTIVE SUMMARY

monitoring stations. Physical characteristics of soil were characterized through specific parameters viz bulk density, porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH.

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 6.77 at SQ1 to 6.86 at SQ4 which shows that the soil is alkaline in nature. Potassium is found to be from 392.75 mg/kg (SQ6) to 367.25 mg/kg (SQ4). The water holding capacity is found in between 31.68% (SQ7) to 27.10 % (SQ8).

Impact on Flora and Fauna

There is no forest area in the core zone area of the lease. As the mining activity is restricted to core zone, no significant impact on the flora of the buffer zone due to the proposed mining of Soapstone is anticipated.

The incremental dust generations due to the mining operations, at the boundary of the mine lease are insignificant and it is also expected that with the adoption of mitigatory measures as suggested in EMP, the impact due to operation of the mine will be minimal on the terrestrial ecosystem and also on the adjacent forest area.

The impact on the fauna of the buffer zone due to the mining activity will be marginal. The proposed progressive plantation over a period of time will reduce the impact, if any, on the fauna.

Impact on Land Use Pattern

The proposed open cast mine will result in change the land use pattern of the ML area. The land degradation is expected during mining activities like excavation, overburden dumping, soil extraction etc. Land requirement for the project has been assessed considering functional needs.

Impact on Socio - Economic Aspects

EXECUTIVE SUMMARY

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 proposed Soapstone Mine will be providing employment to local population and it will be give preference to the local people whenever there is requirement of man power

1.8 ENVIRONMENTALMANAGEMENTPLAN

The summary of environmental mitigation measures are given in below table

Table 1.3: Proposed Environmental Mitigation Measures

Impact Predicted	Suggestive measure
Disturbance of free movement/living of wild fauna	<ul style="list-style-type: none">• Awareness camps will be conducted for labours to make them aware about sensitivity/importance of forestlife.• No tract or new road for movement of labours or vehicles be laid in reserve forest area, this will prevent forest fragmentation, encroachment and human – animal encounter• Care will be taken that noise produced during vehicles movement for carrying materials are within the permissible noise level. Higher noise level in the forest area will lead to restless and failure in detection of calls of mates and young ones• Care will be taken that no hunting of animals carried out by labours.• If wild animals are noticed crossing the core zone, it will not be disturbed atall.• Labours will not be allowed to discards food, plastic etc., which can attract animals near the core site.• Only low polluting vehicle will be allowed for carrying ore materials. All vehicles allowed in the project site area will have to provide pollution under control certificate at the end of threemonths.• No honk will be allowed in the forest area, noise level will be within permissible limit (silent zone-50dB during day

EXECUTIVE SUMMARY

	time) as per noise pollution (regulation and control) rules, 2000, CPCB norms.
Harvesting of forest flora	<ul style="list-style-type: none"> No tree cutting, chopping, lumbering, uprooting of shrubs and herbs should be allowed. No piling of ore material should in the reserve forest area. Collections of economically important plants will be fully restricted.

1.9 ANALYSIS OF ALTERNATIVES

The Soapstone has been identified based on the result of geological investigations and exploration carried out by the Geological Survey of India (GSI). The mining projects are site specific as such alternate sites were not considered.

The mine is operated by opencast mechanized method of mining. No other alternative technologies can be used because of the hard nature of the ore. Proposed mine is using eco-friendly measures to minimize the impact of mining on the surrounding environment.

1.10 ENVIRONMENTAL MONITORING PROGRAM

Attributes	Sampling		Measurement Method	Test Procedure
	Network	Frequency		
A. Air Environment				
Pollutants PM2.5, PM10	5 locations in the project impact area (Minimum 2 Locations in upwind side, 3 sites in Downwind side / impact zone and 1 in core zone)	Once in a season.	Gravimetric method	-
			Gravimetric method	-
SO2			EPA Modified West & Geake method	Absorption inPotassium Tetra Chloromercurate followed by Colorimetric estimation using P- Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part - II).
NO2			Arsenite modified Jacob	Absorption indil. NaOH and then estimated

EXECUTIVE SUMMARY

			Hochheiser	colorimetrically with sulphanilamide and N (I-Nephthyle) Ethylene diamineDihydrochlor ideandHydrogenPero xide (CPCB Method).
B. Water Environment				
pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Chromium, Aluminum, Boron, Phenolic Compounds	Set of grab samples during pre and post- monsoon for ground and surface Water in the vicinity.	Diurnal and Season wise	As per IS 10500	Samples for water quality should be collected and analyzed as per : IS : 2488 (Part 1-5) methods for sampling andtesting of Industrial effluents Standard methods for examination of water and wastewater analysis published by American Public Health Association.
C. Noise				
Noise levels at Day & night time - Leq dB (A)	Mine Boundary , High noise generating areas within the lease	Quarterly / Half yearly	As per CPCB norms	As per CPCB norms
D. Soil				
pH, Bulk Density, Soil texture,	3 locations in the project impact area	Yearly/half yearly	As per USDA Method	As per USDA Method

EXECUTIVE SUMMARY

Nitrogen, Available Phosphorus, Potassium, Calcium, Magnesium, Sodium, Electrical Conductivity, Organic Matter, Chloride				
E. Socioeconomic				
Demographic structure Infrastructure resource base Economic resource base Health status: Morbidity pattern Cultural and Aesthetic attributes Education	Socioeconomic survey is based on proportionate, stratified and random sampling method	Minimum for two phases of the project	Primary	Secondary data from census records, statistical hard books, topo sheets, health Records and relevant official records available with Govt. Agencies

1.10 COST ESTIMATES

The details of the cost to for the Environmental Management plan for 5 years, the budget for Corporate Environmental Responsibility (CER) and year wise allocation of funds for the various activities proposed to be taken up under CER programme has been given in below

Table No – 4

Corporate Environment Responsibility:

CER (Corporate Environment Responsibility) details for the Project

CER plan is given below:

Total Cost of the Project = Rs. 51,97,500 Lakhs

Yearly CER cost for the project, i.e. 5% of the total project cost -

Rs. 51,97,500 Lakhs x 0.05 = Rs. (2,59,875 Rupee)

EXECUTIVE SUMMARY

This is the proposed cost CER Plan, Activities and actual cost will be finalized as per the Actual need of the area.

(ON THE BASIS OF NEED BASE ASSESSMENT SURVEY)

Table No – 4 Budget allotted for CER

This is the Proposed CER Plan, Activities will be Finalized as per the Actual need of the area (ON THE BASIS OF NEED BASE ASSESSMENT SURVEY)		
S.N.	Particulars	Activity
1.	Drinking water supply	Provide drinking water facility in surrounding villages and schools by hand pump/ water tanker/ natural springs etc.
2.	Health	Free distribution of medicines, health check-up camps nearby village
3.	Electrification including solar power	Solar lamp distribution& Solar street light installation
4.	Sanitation	Constructed the Toilets facilities for women nearby village
5.	Education	Distribution of school bags & Books in nearby Primary Schools

Table No.-5 Budget allotted for project operation cost & Environmental Management Programme

Project Cost along with analysis in terms of Economic Viability of the Project:

The project cost is about Rs. 51.975 Lakhs as all the equipments will be required for Mining & hence, will be taken on rent. There is built in profit margin, therefore, proposed project will be economically viable.

S. No.	Description	Unit	Total (Rs.)
A. Project Operation Cost			
1.	Manpower Cost:	(Total Man power 34) Assuming 240days	39,04000
	Geologist - 01	Rs. 25,000/ month= 2,00,000/=	
	Mine Engineer -01	Rs. 25,000/ month= 2,00,000/=	
	Skilled Worker-02	Rs.550 / day x2 x 240= 264000/=	
	Unskilled Worker-30	450 x 240 x 30= 3240000/=	

EXECUTIVE SUMMARY

2.	Expenditure on Occupational Health: PPE & hand sanitizer ,thermal scanner , mask (due to covid -19 epidemic)with first aid kit Medical checkup and Medicine (Once in a month)	1000/worker (1000 x 34)= 34,000 <i>Doctor's visit:</i> 10000/ month (9working months) =90,000 <i>Medicines</i> (Assuming 500/worker/month) 500 x 34 x9 = 1,395,00	2,63,500
3.	Equipment's/Tools/Machineries	240 days Assuming Rs.1500/day	3,60,000
4.	Drinking and Sanitary Facilities	➤ Rs. 1000/day for drinking/domestic (240days)=2,40,000 ➤ Rs. 30,000/ Bio-toilets x 2=60,000	3,30,000
	Total Project Operation Cost (A)		Rs. 48,57,500 (48.57 Lakh)

B. Break-up of Expenditure on Environment Protection & Environment Management

5.	Haulage Road Repair & Maintenance <ul style="list-style-type: none"> Filling, Leveling and widening of the road up to width of 6m and length of 200 m. Setting & Fixing of Cut Stone on the leveled road. 	300 m (L) x 6 m (W)	1,00,000
6.	Water Sprinkling on Haulage Road for Dust Suppression	Assuming Rs.688/day for 240 days of working Tanker Cost: Rs. 688/Tanker Tanker Capacity: 5000 liter, No. of Tankers required: 1	1,65,000
7.	Plantation along the road side & post plantation care	Plantation with post plantation care @ 100/sapling	2,50,00

EXECUTIVE SUMMARY

		50sapling within one year 50 saplingx 5 year =250sapling 250 x 100= 25000/=	
		<i>Note: Annual cost will increase with increase in no. of sapling.</i>	
8.	Environmental Monitoring & Compliances.	➤ Half Yearly Monitoring of Environmental Parameters viz. Air, water, Noise & Soil. ➤ Half Yearly Submission of Compliances.	50,000
	Total Environment Protection & Management Cost (B)		Rs. 3,40,000 (3.40Lakhs)
	Total Project Cost (A+B)		Rs. 48.575 +3.40 (51,97,500Lakhs)

1.11 ADDITIONAL STUDIES

Risk Assessment and Disaster Management Plan

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding Mines Manager's Certificate of Competency. Moreover, mining staff will be sent to refresher courses from time to time to keep them updated.

Disaster Management Plan

Emergency preparedness is an important aspect in the planning of Disaster Management. Personnel would be trained suitably and prepared mentally and physically in emergency response through carefully planned, simulated procedures. Similarly, the key personnel and essential personnel shall be trained in the operations.

1.12 PUBLIC CONSULTATION

Public Hearing

EXECUTIVE SUMMARY

In consonance with the EIA notification dated 14th September 2006, vide section 1 (a) related to Public Hearing, the draft EIA/EMP report submitted to the Uttarakhand Environment Protection & Pollution Control Board (UEPPCB) for public hearing.

1.13PROJECT BENEFITS

The impact on the civic amenities will be substantial after the commencement of mining activities. Medical facilities will be provided in the form of first-aid facility at the mine. These medical facilities will also be available to local people in the surrounding in case of emergencies.

- Generation of employment and improved standard of living;
- Increased revenue to the State by way of royalty, taxes and duties; and
- Superior communication and transport facilities etc.

The employment of local people in primary and secondary sectors of project will upgrade the prosperity of the region.

1.14CONCLUSIONS

The mining operations will meet the compliance requirements of MoEF&CC;

Community impacts will be beneficial, as the project will generate significant economic benefits for the region;

Adoption of Best Available Technology and Best Management Practices with more environmental friendly process; and

With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.