

M/S DHAULINAAG MINES & MINERALS
R/O - NAYNA VIHAR, DAMUWDHUNGA KATHGODAM, DISTRICT-
NAINITAL, UTTARAKHAND

Date: 04/03/2023

To,

The Member Secretary,
Gaura Devi Paryavaran Bhawan
46 B, IT Park, Sahastradhara Road,
Dehradun, Uttarakhand,

Subject: Submission of Draft EIA report with necessary annexures, for Proposed “Garuwa Sirmoli Soapstone Mining Project”, Area- 3.784 Ha at Village: Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, State- Uttarakhand

Proposal No. - SIA/UK/MIN/78030/2020

File No. - EC-01(16)/2022

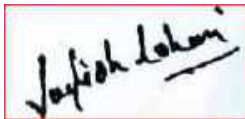
Dear Sir,

As per received acceptance letter, we are herewith submitting Draft EIA report with necessary annexures, for Proposed “Garuwa Sirmoli Soapstone Mining Project”, Area- 3.784 Ha at Village: Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, and State- Uttarakhand by M/s Dhaulinaag Mines & Minerals in prescribed format for kind consideration to obtain for environment clearance.

We kindly request you to consider our application for Environmental Clearance.

Thanking You

Yours Faithfully



M/s Dhaulinaag Mines & Minerals
Shri Jagdish Chandra Lohani

(Authorized Signatory)

DRAFT ENVIRONMENT IMPACT ASSESSMENT & ENVIRONMENT MANAGEMENT PLAN

File No. EC-01(16)/2022

Garuwa Sirmoli Saopstone Mining Project

At

**Village-Garuwa Sirmoli, Tehsil- Kanda & District-
Bageshwar, Uttarakhand**

Sanctioned Lease Area- 3.784 Ha

Proposed Maximum Production – 15,426 TPA

DEIA REPORT

PROJECT PROPONENT

M/s Dhaulinaag Mines & Minerals

**R/o – Nayna Vihar, Damuwdhunga Kathgodam, District-
Nainital**

(Uttarakhand - 263139)

ENVIRONMENT CONSULTANT



COGNIZANCE RESEARCH INDIA PVT. LTD.

(Accredited by QCI/NABET)

B02, Block-H 61, Sector-63, Noida, U.P

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CHAPTER – 1

INTRODUCTION

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

DEIA
CHAPTER I-INTRODUCTION

CHAPTER-1

INTRODUCTION



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Vijish Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
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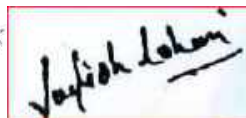
Vijish Lohani

1.0 PURPOSE OF THEREPORT

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, Ref No. 219/SEIAA Dated 22 February 2023, under EIA Notification of the MoEF dated 14-9-2006, 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 3.784 Ha, The project falls under Category- “B-1” as per EIA Notification 2006 and its subsequent amendments thereof of the Ministry of Environment Forests & Climate Change, GOI. As per NGT Order Dated 13-09-2018 and MOEF & CC OM No L-11011/175/2018-IA-II (M) Dated 12-12-2018 the project comes under B1 Category as the area is more than 5 Ha.

1.1 IDENTIFICATION OF PROJECTPROPONENT

The proposed project of Garuwa Sirmoli Soapstone Mining Project by M/s Dhaulinaag Mines & Minerals is for soap stone mineral mining which covers an area of 3.784 Ha. At Village- Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, Uttarakhand. LOI has been granted in favour of M/s Dhaulinaag Mines & Minerals, vide letter no. 1449/VII-A-1/2021/1 (34)/21 dated – 1st October



2021, for a period of 25 years attached as Annexure II. In LOI mining lease area has been given 3.937 Ha. But in demarcation lease area reduce to 3.784 Ha. The EIA-EMP report has been prepared as per the TOR granted under the EIA Notification of September 14th 2006. In order to assess the impact on environment due to proposed mining, it is necessary to ascertain the present status of environment prevailing at the project site and identification and assessment of impacts on the environment of the proposed operations.

1.2 BREIF DESCRIPTION OF PROJECT

The proposed project is to mine Soapstone from the lease area. 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.

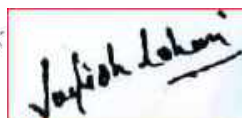
The LOI has been granted to M/s Dhaulinaag Mines & Minerals, vide letter no. 1449/VII-A-1/2021/1 (34)/21 dated – 1st October 2021, for a period of 25 years, for mining at Village- Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, Uttarakhand. The expected project cost of the mining is Rs. 79.022 lakhs; Area- 3.784 Ha, with Maximum production has been estimated 15,426 tonnes /annum (in Vth year).

The EIA-EMP report has been prepared as per the TOR granted under the EIA Notification. Further to assess the impact on environment due to proposed mining, 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 & socio-economic condition of human beings.

(a) Location

Village	Tehsil	District	State	Area in Ha.
Garuwa Sirmoli	Kanda	Bageshwar	Uttarakhand	3.784

(b) Project Coordinate



Project: Garuwa Sirmoli Soapstone Mining Project
 Proponent: M/s Dhaulinaag Mines & Minerals
 Village: Garuwa Sirmoli
 Tehsil- Kanda & District-Bageshwar,
 State- Uttarakhand
 Area: 3.784 Ha

DEIA
 CHAPTER I-INTRODUCTION

Pillar No.	Latitude	Longitude
1	29°50'52.08"N	79°55'36.76"E
2	29°50'51.80"N	79°55'33.20"E
3	29°50'57.80"N	79°55'31.10"E
4	29°50'55.58"N	79°55'28.44"E
5	29°50'56.50"N	79°55'27.60"E
6	29°51'3.14"N	79°55'28.51"E
7	29°51'3.46"N	79°55'29.43"E
8	29°51'0.69"N	79°55'32.34"E
9	29°50'59.77"N	79°55'31.22"E
10	29°50'59.27"N	79°55'31.86"E
11	29°50'59.96"N	79°55'33.30"E
12	29°50'58.54"N	79°55'34.79"E
13	29°50'55.88"N	79°55'34.19"E



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Vijesh Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

DEIA
CHAPTER I-INTRODUCTION

c) Location Maps

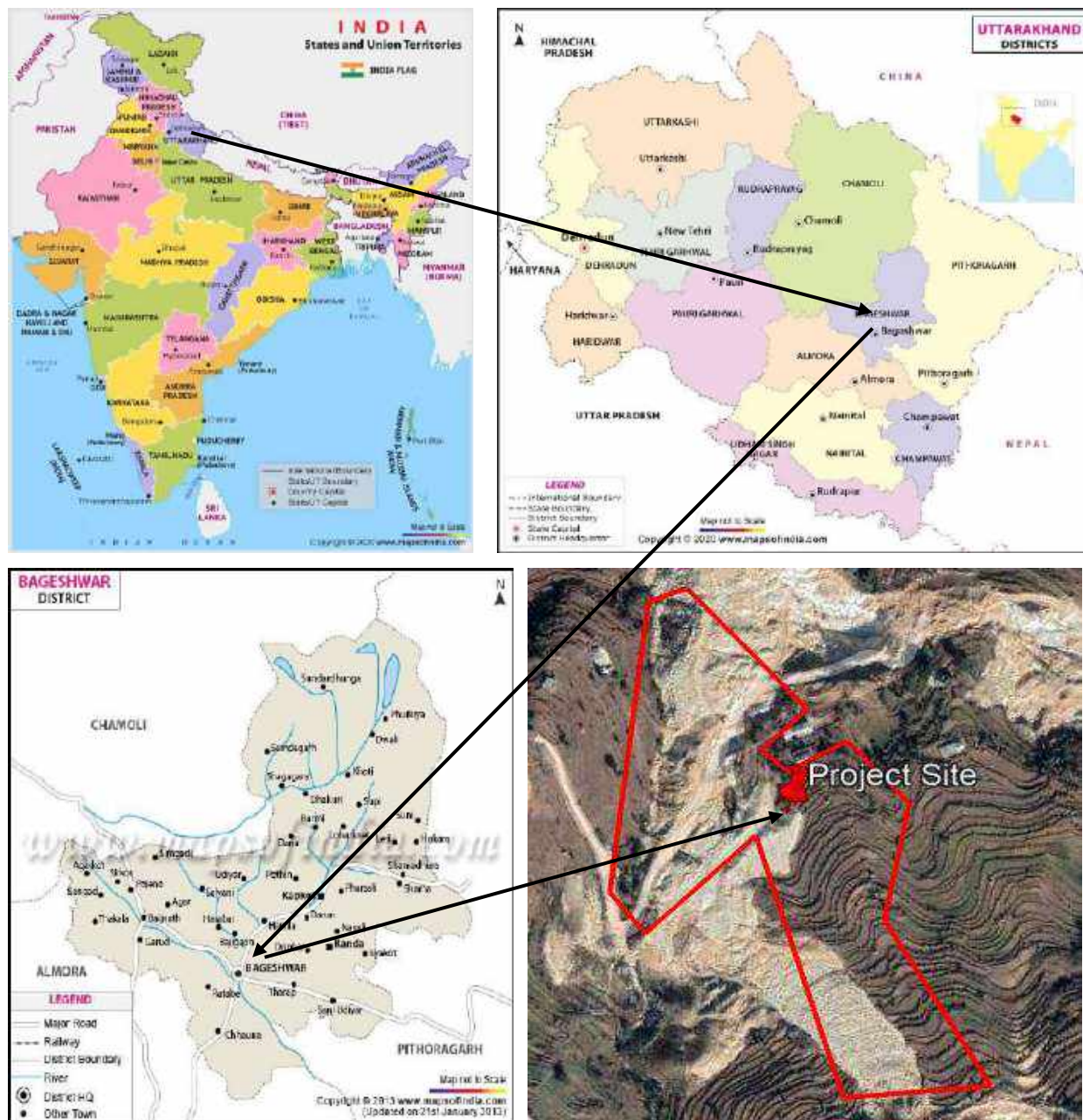


Figure 1.1 Location Map



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Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

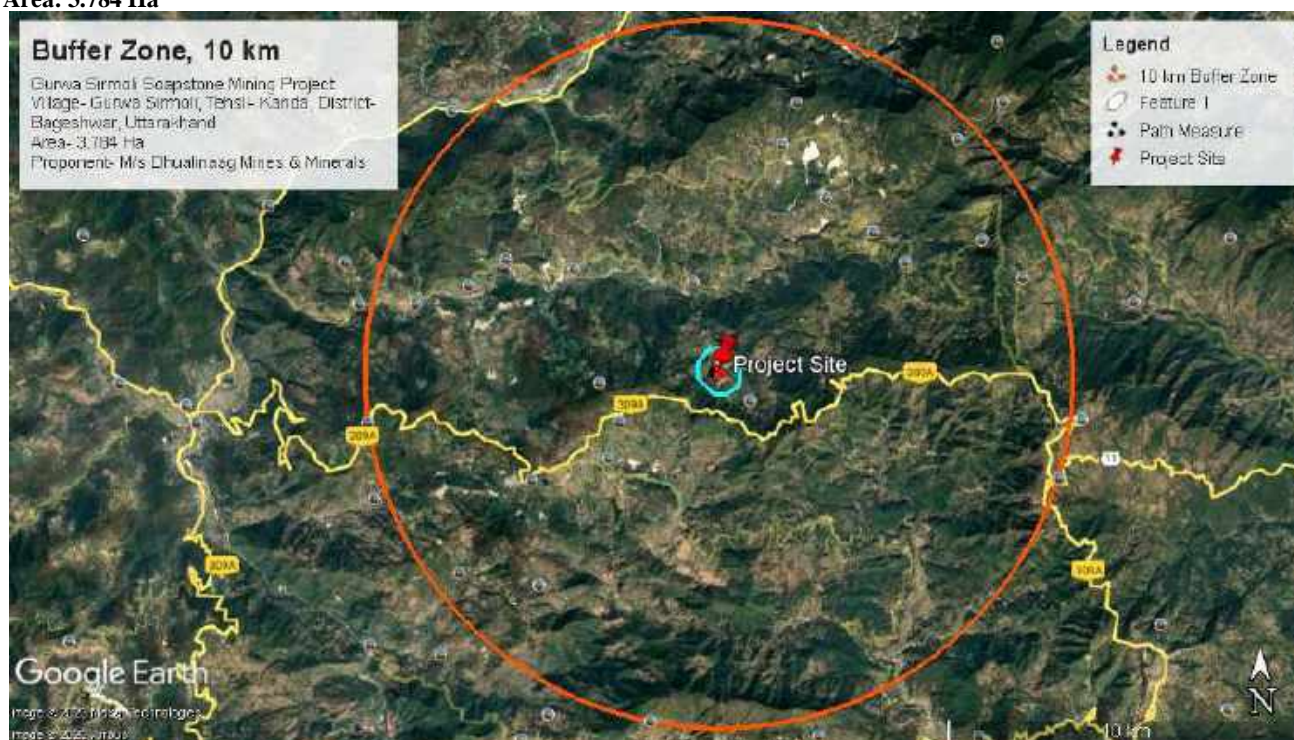


Figure1.2: 10 Km Buffer Map

(c) Details of Production

S.No.	Year	Production (Tonnes)
1.	1 st Year	10,515
2.	2 nd Year	13,094
3.	3 rd Year	13,470
4.	4 th Year	14,608
5.	5 th Year	15,426

Maximum Production: 15426 tonnes /annum (in Vth year)

Site & Surrounding

Nearest Settlements	<ul style="list-style-type: none"> Kanda Village, 600 m in NW direction Dhapti Village, 400 m in SSE direction
Nearest Road	<ul style="list-style-type: none"> Non-Metalled Road, passing through the lease area Village Road – Metalled 350 m in W direction National Highway (NH-309A), Pithoragarh Road, 0.95

	<p>km* towards S direction.</p> <ul style="list-style-type: none"> • ODR (Jarti Road.) 5.02 km in North direction. • MDR (Dophar- Banlekha Road) 2.21 km in N direction. • MDR (Kanda- Rawatsera- Bans Patan Road), 4.15 km in S direction.
Nearest Airport	<ul style="list-style-type: none"> • Naini Saini, Pithoragarh Airport, Pithoragarh, towards SE direction (40.48 km*)
Nearest Railway Station	<ul style="list-style-type: none"> • Kathgodam Railway Station, District- Nainital, towards SSW direction (approx. 73.94 Km*)
Water body	<ul style="list-style-type: none"> • Saryu River 9.08 km in NW direction • Pungar River 1.88 km in N direction • Kulur Stream 8.24 km in SE direction
Nearest School/ college	<ul style="list-style-type: none"> • Government Primary School, Agar-approx. 2.99 km in S direction • Government Primary School, Jhakra-approx. 0.94 km in ENE direction • Government Primary School, Khantoli-approx. 1.75 km in S direction • Government Junior High School, Khantoli-approx. 2.14 km in SE direction
Reserve/ Protected Forest	<ul style="list-style-type: none"> • Huram Reserve Forest, 2.94 km in SE direction • Chaukori Berinag Reserve Forest, 5.82 km in ESE direction • Manjgaon Reserve Forest, 2.37 km in NW direction • Bhandola Reserve Forest, 1.91 km in NNE direction • Letala Reserve Forest, 7.50 km in N direction • Pokhdanda Reserve Forest, 8.11 km in NNW direction • Baisbunga Reserve Forest, 7.79 km in NW direction • Pungar Reserve Forest, 8.42 km in NW direction • Phalyanti Reserve Forest, 8.84 km in W • Gairar Reserve Forest, 5.21 km in W direction • Chhatena Reserve Forest, 9.10 km in WSW direction • Gurna Reserve Forest, 6.67 km in SW direction • Bankot Reserve Forest, 9.42 km in SSW direction • Ratmoli Reserve Forest, 8.63 km in S direction
Nearest Hospital	<ul style="list-style-type: none"> • Banlekh Hospital -approx. 2.59 km in N direction.

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	<ul style="list-style-type: none"> Community Health Center, 3.20 km in NNE direction.
Temple	<ul style="list-style-type: none"> Hanuman Mandir, Bageshwar -approx 4.23 km in NW direction. Dhaulinaag Temple, 1.23 km in S direction

Table No. 1.1 Project Salient Features

On-line proposal No.	SIA/UK/MIN/78030/2022		
File No. allotted by SEIAA, UK	EC-01(16)/2022		
Name of Proponent	M/s Dhaulinaag Mines & Minerals		
Full correspondence address of proponent	Nayna Vihar, Damuwdhunga Kathgodam, District-Nainital, Uttarakhand		
Name of Project	Garuwa Sirmoli Soapstone Mining Project		
Name of Village	Garuwa Sirmoli		
Tehsil	Kanda		
District	Bageshwar		
Name of Minor Mineral	Soapstone		
Sanctioned Lease Area (in Ha.)	3.784 ha		
Category of the project	“B1”		
Max & Min mRL within lease area	Max- 1492.45 mRL & 1401.85 mRL		
Pillar Coordinates (Verified by DMO)	Pillar No.	Latitude	Longitude
	1	29°50'52.08"N	79°55'36.76"E
	2	29°50'51.80"N	79°55'33.20"E
	3	29°50'57.80"N	79°55'31.10"E
	4	29°50'55.58"N	79°55'28.44"E
	5	29°50'56.50"N	79°55'27.60"E
	6	29°51'3.14"N	79°55'28.51"E



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	7	29°51'3.46"N	79°55'29.43"E
	8	29°51'0.69"N	79°55'32.34"E
	9	29°50'59.77"N	79°55'31.22"E
	10	29°50'59.27"N	79°55'31.86"E
	11	29°50'59.96"N	79°55'33.30"E
	12	29°50'58.54"N	79°55'34.79"E
	13	29°50'55.88"N	79°55'34.19"E
Maximum Proposed Production	15,426 tonnes /annum (in Vth year)		
Sanctioned Period of Mine lease	Maximum 25 years		
Method of Mining	Open Cast Mechanized Method		
No. of working days	240 days		
Working hours/day	8hrs		
No. of workers	38		
Type of Land	Agriculture land		
Ultimate Depth of Mining	12 m		
Nearest metalled road from site	550 m		
Water Requirement	PURPOSE		REQUIREMENT (KLD)
	Drinking		0.38
	Suppression of dust		5.0
	Plantation		3.8
	Mobile Toilet		0.38
	Total		9.56
Any litigation pending against the project or land in any court	No		
Details of Lease Area in approved DSR	Yes, given in the DSR		
Proposed Project cost	Rs 79.02 lakh		
Proposed EMP budget including the CER Cost as per OM dated 30 Sep 2020	EMP Recurring Cost- 9.10 Lakh CER cost – 6.40 Lakh		
Length and breadth of Haul Road	Length: 500 m, width: 5 m		
No. of Trees to be Planted	1900 plants		



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Project's importance to the country and the region

The project when in operation will provide employment to the people residing in vicinity. It has been estimated that 240 days will be generated annually and about 38 people will be benefited directly and indirectly by the project.

The project involves extraction of Soapstone used for various constructional activities. It is expected that the proposed mining project would improve the supply of construction material making a positive impact on the infrastructural projects like construction of roads, buildings, bridges etc in the state.

1.3 REGULATORY COMPLIANCES & APPLICABLE LAWS/REGULATIONS

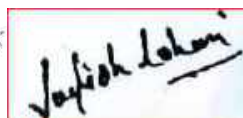
- There is no legal case against the project and project proponent.
- There is no national park/Sanctuary notified under the Wildlife Protection Act in the study area.

1.4 SCOPE OF THE STUDY

The applications for prior Environmental Clearance (Form-1, PFR) for the proposed project was submitted online vide Proposal no. SIA/UK/MIN/78030/2022 on 09 June 2022 was considered by the SEIAA (Uttarakhand) in its meeting dated 16 February 2023 for determination of the Terms of Reference (TOR) for preparation of the Draft Environmental Impact Assessment (DEIA) report and Environmental Management Plan. The SEIAA-SEAC-Uttarakhand prescribed the TOR.

Standard Terms of References

TOR Ref.	TOR Points for the preparation of EIA	TOR Reply																					
1.	Year wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force w.r.t. the highest production achieved prior to 1994.	<table border="1"> <thead> <tr> <th>S. No.</th><th>Year</th><th>Production (Tonnes)</th></tr> </thead> <tbody> <tr> <td>1.</td><td>1st Year</td><td>10,515</td></tr> <tr> <td>2.</td><td>2nd Year</td><td>13,094</td></tr> <tr> <td>3.</td><td>3rd Year</td><td>13,470</td></tr> <tr> <td>4.</td><td>4th Year</td><td>14,608</td></tr> <tr> <td>5.</td><td>5th Year</td><td>15,426</td></tr> <tr> <td colspan="3">Maximum Proposed Production per year: 15426 tonnes /annum (in Vth year)</td></tr> </tbody> </table>	S. No.	Year	Production (Tonnes)	1.	1 st Year	10,515	2.	2 nd Year	13,094	3.	3 rd Year	13,470	4.	4 th Year	14,608	5.	5 th Year	15,426	Maximum Proposed Production per year: 15426 tonnes /annum (in Vth year)		
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Maximum Proposed Production per year: 15426 tonnes /annum (in Vth year)																							
2.	A copy of the document in supports of the fact that the proponent is the rightful lessee of the mine	The Mining Lease was granted in favour of M/s Dhaulinaag Mines																					



	should be given.	& Minerals, vide letter no. 1449/VII-A-1/2021/1 (34)/21 dated – 1th October 2021, for a period of 25 years. LOI is being attached in Annexure II.
3.	All documents including approved mine plan, EIA and public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its managements, mining technologies etc. and should be in the name of the lessee. The above reports should also match with the latest district survey report (DSR) notification dated 25 th July, 2018. Data obtained from this DSR should be incorporated in the EIA report for Impact Identification, Interpretation, Prediction, Carrying capacity and Mitigation.	The mine lease area, production levels, waste generation and its managements, mining technologies is compatible in all documents i.e Mine Plan, DEIA Report LOI Attached as Annexure-II, Mine Plan as Annexure-III
4.	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery /toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an imagery of the proposed area should clearly show the land use and other ecological features of the study area (Core and buffer zone).	Toposheet map with all corner coordinates of the mine lease area given in Chapter-1 &Chapter-3.
5.	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating map of the area, geomorphology and land forms of the area, existing minerals history of the area, important water bodies, streams and rivers and soil characteristics.	Details given in Chapter 3.
6.	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The land proposed for mining conforms the Land Policy of state &State has itself allotted the lease in E- Tender.(Details given in Chapter-1)
7.	It should be clearly stated whether the proponent Company has a well laid down Environment policy approved by its Board of Directors? If so, it	Environment policy approved by its Board of Directors attached as Annexure-X.

	may be spelt out in the EIA Report with description of the prescribed operation process/procedures to bring into focus any infringement/devotion/violation of the environmental or forest norms/conditions? The hierarchical system or administrative order of the company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of responding of non-compliances /violations of environmental norms to the Boards of Directors of the Company and /or shareholders or stakeholders at large, may also is detailed in the EIA Reports.	
8.	Issues relating to Mine safety, including subsidence study in case of underground mining and slope study in the case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Details given in chapter-2 &7.
9.	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine /lease period.	<p>The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report in chapter-1</p> <p>All the details in the EIA report are for the life of the mine period. The details of mining & production have been given in the report.</p>
10.	Land use of the study area delineating forest area, agricultural lands, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any of change of land use should be given.	Detail given in chapter-3

11.	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	Details given in Chapter-2, 3&4.
12.	A Certificate from the competent authority in the State Forest Departments should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the project proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forest, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assists the Expert Appraised Committees.	<p>There are many Reserve Forest Area involved within Project site. Detail given in chapter-1.</p> <p>Conservation plan is being provided for this at the time of FEIA.</p>
13.	Status of forestry clearance for the broken up area and virgin forestland involved in the project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	<p>There are many Reserve Forest Area involved within Project site. Detail given in chapter-1.</p> <p>Conservation plan is being provided for this at the time of FEIA.</p>
14.	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	Detail given in Chapter-3.
15.	The vegetation in the RF/PF areas in the study area, with necessary details, should be indicated.	Detail given in Chapter-3.
16.	A study shall be got done ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measure required, should be worked out with cost implications and submitted.	Detail given in Chapter-3.

17.	Location of National parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden, Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	No National parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, and Ramsar site Tiger/Elephant Reserves (existing as well as proposed) Within 10 km periphery of the mine lease.
18.	A detailed biological study of the study area [core zone and duffer zone (10 Km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey clearly indicating the Schedule of the fauna present. In case of any scheduled –I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State forest and Wildlife Departments and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detail given in Chapter-3.
19.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL. CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The mining projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not Applicable.
20.	R&R Plan/compensation details for the project Affected People (PAP) should be furnished. While preparing the R&R plan, the relevant State/National Rehabilitation & Resettlement policy should be kept in view. In respect of	Not Applicable.

	<p>SCs/STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of villages including their R&R and socio-economic aspects should be discussed in the report.</p>	
21.	<p>One Season (non-monsoon)[i.e. March-May (Summer Season); October-December (Post monsoon seasons); December –February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so complied presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	<p>Detail given in Chapter-3. Pre monsoon season (October 2022 to December 2022) taken as monitoring period.</p>
22.	<p>Air quality modeling should be carried out for preparation of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of minerals. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on the location map</p>	<p>Detail given in chapter-4.</p>

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	clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre- dominant wind direction may also be indicated on the map.	
23.	The water requirement for the project, its availability and sources should be furnished. A detailed water balance should also be provided. Fresh water requirement for the project should be indicated.	The water requirement for the project is 9.56 KLD for drinking, dust suppression and green belt development. This water supplied from nearby area. Details given in Chapter-2
24.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the project should be provided.	Water requirement will be fulfilled by private water tanker. So, no clearance is required. The project do not consume any process water except for drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of ground water.
25.	Description of water conservation measures proposed to be adopted in the project should be given. Details of rainwater harvesting proposed in the project, if any, should be provided.	The water collected in the mine during monsoon season will be extracted with the help of pump & will be discharged in nearby pond with help of tankers.
26.	Impact of the project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	Mining will be up to 12 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table.
27.	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will interest groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished.	Mining will be up to 12 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table. So no NOC required from Central Ground Water Authority.



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	The Report inter-alia shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Centre Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	
28.	Details of any stream, seasonal or otherwise, passing through the lease area and modification/diversion proposed, if any and the impact of the same on the hydrology should be brought out.	Not Applicable.
29.	Information on site elevation, working depth, groundwater table etc, Should be provided both in AMSL and bgl. A schematics diagram may also be provided for the same.	Detail given in chapter-2 & 3. Mine plan attached as Annexure-III
30.	A time bound progressive Greenbelt Development plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind; the same will have to be executed up front on commencement of the project. Phase wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	Detail given in chapter-8,9
31.	Impact on local transport infrastructure due to the project should be indicated. Projected increase in truck traffic as a result of the project in the present road network (including those outside the project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if	Detail given in chapter-4



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	contemplated (including action to be taken by other agencies such as state government) should be covered. Project proponent shall conduct impact of Transportation study as per Indian Road Congress Guidelines.	
32.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	Detail given in chapter-2
33.	Conceptual post mining land use and reclamation and restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA.	Detail given in chapter-2
34.	Occupational Health impacts of the project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Detail given in chapter-7
35.	Public health implications of the project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	Detail given in chapter-8
36.	Measures of socio economic significance and influence to the local community proposed to be provided by the project proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Detail given in chapter-8
37.	Detailed Environment Management Plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any,	Detail given in chapter-9



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	occupational health impacts besides other impacts specific to the proposed project.	
38.	Public hearing points raised and commitment of the project proponent on the same along with the time bound action plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP report of the project.	Detail will be provided after conduct of public hearing.
39.	Details of litigation pending against the project, if any, with direction/order passed by any court of law against the project should be given.	No Litigation Pending.
40.	The cost of the project (capital cost & recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.	Detail given in chapter-9 &10
41.	A Disaster Management Plan shall be prepared and included in the EIA/EMP report.	Detail given in chapter-7
42.	Benefits of the project if the project is implemented should be spelt out. The benefits of the project shall clearly indicate environmental, social, economic, employment potential, etc.	Detail given in chapter-8 & 9.
43.	Besides the above, the below mentioned general points are also to be followed:-	
a)	Executive Summary of the EIA/EMP Report	Complied
b)	All document to be properly referenced with index and continuous page numbering	Complied
c)	Where data are presented in the report especially in table, the period in which the data were collected and the sources should be indicated.	Complied
d)	Project Proponent shall enclose all the analysis /testing reports of water, air, soil, noise, etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the project.	Complied
e)	Where the documents provided are in a language other than English, an English translation should be provided.	Complied
f)	The Questionnaire for environmental appraisal of	Complied

	mining projects as devised earlier by the ministry shall also be filled and submitted.	
g)	While preparing the EIA report the instruction for the proponent & instruction for the consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA-II (I) dated 4 th August 2009, which are available on the website of the ministry, should be followed	Complied
h)	Changes, if any made in the basic scope and project parameter (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.	Complied With EIA report
i)	As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	This is new case for Mining. No certified compliance report is required.
j)	The EIA report should also include: (i) surface plan of the area indicating contours of main topographic features, drainage and mining area (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Complied
k)	All pages of technical documents/EIA/EMP should be signed by the consultant and project proponent both.	Complied
l)	The lease area, its address and production per annum should match with as mentioned in DSR and LOI. In case there is any difference classification/amendment letter from competent authorities shall be submitted.	Complied

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m)	Plan for using the mine void for productive use in consultation with local administration and gram panchayat.	Complied
n)	In case project proponent intends to temporarily mine out materials outside the mine lease area than NO from competent authority for doing so should be submitted and details of such area and associated environmental impacts should be included in EIA/EMP report this should be clearly mentioned during public hearing.	Complied
o)	Road network to be used by the project should be clearly shown on survey of India toposheet in 1:20,000 scale. In case road network involves forest road, permission should be obtained from forest department and a copy of the same should be submitted at the time of appraisal of EIA/EMP report.	Complied
p)	Project proponent should submit action plan carrying out plantation at least 1000 plants/Ha of lease area. In this case PP, should prepare a plan duly approved either by forest department of Horticulture department for planting either on government land or community land within periphery of 5Kms from the boundary of lease area along with provision for maintenance for 5 years. Survival of plants below Uttarakhand forest department's survival rate will be treated as violation of EC condition.	Complied
q)	In view of the agricultural land proposed under the mining lease area, the project proponent needs to submit the cost benefit analysis composing the current agricultural production and annual turnover vis-à-vis the mineral cost and beneficiaries.	Complied



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CHAPTER – 2

DESCRIPTION OF THE PROJECT

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DESCRIPTION OF THE PROJECT



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2.0 GENERAL

The project is proposed by, M/s Dhaulinaag Mines & Minerals R/o Nayna Vihar, Damuwadhunga Kathgodam, District- Nainital, Uttarakhand for the mining of Soapstone over an area of 3.784 Ha located at Village- Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, Uttarakhand.

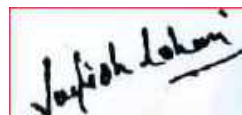
2.1 TYPE OF PROJECT

The project is proposed for the excavation of soapstone from the hill slope. Soapstone, also known as Talc or Talcum Powder, is a mineral that is naturally found in nature. It is an opencast mining project where the entire activity will be done by mechanized method.

2.2 NEED FOR THE PROJECT

The project site lies on hill slope which is agricultural land. With the rapidly increasing demand of Soapstone raw materials, The Industry's demand for fine powder is continuously prompting technological advancements to meet this purpose. The pulverizes/hammer mills developed and manufactured in India are capable of producing up to 700 mesh powder. The world market prefers fine powder which can be produced by adopting new processing techniques like micro screening and sterilization of the product. Talc, in pulverized form, is mostly used as filler in paper, textile, rubber, insecticides and fertilizer industries. Pure talc after calcining, called 'Lava' is used in the manufacture of low-loss ceramic materials essential for radio, radar television, etc. In roofing products, such as, tar paper, asphalt shingles and roll roofing, talc acts as a fire retardant and increases weather resistance. Body and face powders (talcum powder) are prepared from the finest quality talc after adding deodorant and perfumes.

Talc is used mostly in pulverized form as a filler and extender in various industries. The non-pulverized talc is used in refractory, etc. About 56% consumption in 2012-13, was in Paper Industry, followed by Paint (20%), Pesticide (11%), Ceramic (8%) and Cosmetic (4%) industries. Nominal consumption was shared by Fertilizer, Rubber, Textile, Chemicals and other industries. The demand in the domestic market is high for Soapstone. The Industry's demand for fine powder is continuously prompting technological advancements to meet this purpose. Mineral is available in abundant



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 Proponent: M/s Dhaulinaag Mines & Minerals
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quantity in area and can be extracted indigenously. The proposed mining activity is for indigenous consumption only for Pharmaceutical Industry, Cosmetic Industry, Textile, Ceramic, Paint, Rubber, Plastic, Detergent etc.

2.3 LOCATION DETAILS

Village	Tehsil	District	State	Area in Ha.
Garuwa Sirmoli	Kanda	Bageshwar	Uttarakhand	3.784

Table No 2.1: Salient Features of Project

On-line proposal No.	SIA/UK/MIN/78030/2022		
File No. allotted by SEIAA, UK	EC-01(16)/2022		
Name of Proponent	M/s Dhaulinaag Mines & Minerals		
Full correspondence address of proponent	Nayna Vihar, Damuwadhunga Kathgodam, District-Nainital, Uttarakhand		
Name of Project	Garuwa Sirmoli Soapstone Mining Project		
Name of Village	Garuwa Sirmoli		
Tehsil	Kanda		
District	Bageshwar		
Name of Minor Mineral	Soapstone		
Sanctioned Lease Area (in Ha.)	3.784 ha		
Category of the project	“B1”		
Max & Min mRL within lease area	Max- 1492.45 mRL & 1401.85 mRL		
Pillar Coordinates (Verified by DMO)	Pillar No.	Latitude	Longitude
	1	29°50'52.08"N	79°55'36.76"E
	2	29°50'51.80"N	79°55'33.20"E
	3	29°50'57.80"N	79°55'31.10"E



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	4	29°50'55.58"N	79°55'28.44"E
	5	29°50'56.50"N	79°55'27.60"E
	6	29°51'3.14"N	79°55'28.51"E
	7	29°51'3.46"N	79°55'29.43"E
	8	29°51'0.69"N	79°55'32.34"E
	9	29°50'59.77"N	79°55'31.22"E
	10	29°50'59.27"N	79°55'31.86"E
	11	29°50'59.96"N	79°55'33.30"E
	12	29°50'58.54"N	79°55'34.79"E
	13	29°50'55.88"N	79°55'34.19"E
Maximum Proposed Production	15,426 tonnes /annum (in Vth year)		
Sanctioned Period of Mine lease	Maximum 25 years		
Method of Mining	Open Cast Mechanized Method		
No. of working days	240 days		
Working hours/day	8hrs		
No. of workers	38		
Type of Land	Agriculture land		
Ultimate Depth of Mining	12 m		
Nearest metalled road from site	550 m		
Water Requirement	PURPOSE		REQUIREMENT (KLD)
	Drinking		0.38
	Suppression of dust		5.0
	Plantation		3.8
	Mobile Toilet		0.38
	Total		9.56
Any litigation pending against the project or land in any court	No		
Details of Lease Area in approved DSR	Yes, given in the DSR		
Proposed Project cost	Rs 79.02 lakh		



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Proposed EMP budget including the CER Cost as per OM dated 30 Sep 2020	EMP Recurring Cost- 9.10 Lakh CER cost – 6.40 Lakh
Length and breadth of Haul Road	Length: 500 m, width: 5 m
No. of Trees to be Planted	1900 plants

2.4 LEASE HOLD ARE

The entire lease hold area of 3.784 Ha, Village- Garuwa Sirmoli, Tehsil- Kanda and District- Bageshwar, Uttarakhand.

Pillar No.	Latitude	Longitude
1	29°50'52.08"N	79°55'36.76"E
2	29°50'51.80"N	79°55'33.20"E
3	29°50'57.80"N	79°55'31.10"E
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12	29°50'58.54"N	79°55'34.79"E
13	29°50'55.88"N	79°55'34.19"E



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Table2.2- Detail of site & surrounding around Lease Area

Nearest Settlements	<ul style="list-style-type: none"> • Kanda Village, 600 m in NW direction • Dhapti Village, 400 m in SSE direction
Nearest Road	<ul style="list-style-type: none"> • Non-Metalled Road, passing through the lease area • Village Road – Metalled 350 m in W direction • National Highway (NH-309A), Pithoragarh Road, 0.95 km* towards S direction. • ODR (Jarti Road.) 5.02 km in North direction. • MDR (Dophar- Banlekha Road) 2.21 km in N direction. • MDR (Kanda- Rawatsera- Bans Patan Road), 4.15 km in S direction.
Nearest Airport	Pithoragarh Airport, towards SE direction (40.48 km*)
Nearest Railway Station	Kathgodam Railway Station, towards SSW direction (approx. 73.94 Km*)
Water body	<ul style="list-style-type: none"> • Saryu River 9.08 km in NW direction • Gadera Canal 6.57 km in SE direction • Kulur Stream 8.24 km in SE direction
Nearest School/ college	<ul style="list-style-type: none"> • Government Primary School, Agar-approx. 2.99 km in S direction • Government Primary School, Jhakra-approx. 0.94 km in ENE direction • Government Primary School, Khantoli-approx. 1.75 km in S direction • Government Junior High School, Khantoli-approx. 2.14 km in SE direction

Reserve/ Protected Forest	<ul style="list-style-type: none"> • Huram Reserve Forest, 2.94 km in SE direction • Chaukori Berinag Reserve Forest, 5.82 km in ESE direction • Manjgaon Reserve Forest, 2.37 km in NW direction • Bhandola Reserve Forest, 1.91 km in NNE direction • Letala Reserve Forest, 7.50 km in N direction • Pokhdanda Reserve Forest, 8.11 km in NNW direction • Baisbunga Reserve Forest, 7.79 km in NW direction • Pungar Reserve Forest, 8.42 km in NW direction • Phalyanti Reserve Forest, 8.84 km in W • Gairar Reserve Forest, 5.21 km in W direction • Chhatena Reserve Forest, 9.10 km in WSW direction • Gurna Reserve Forest, 6.67 km in SW direction • Bankot Reserve Forest, 9.42 km in SSW direction • Ratmoli Reserve Forest, 8.63 km in S direction
Nearest Hospital	<ul style="list-style-type: none"> • Banlekh Hospital -approx. 2.59 km in N direction. • Community Health Center, 3.20 km in NNE direction.
Temple	<ul style="list-style-type: none"> • Hanuman Mandir, Bageshwar -approx 4.23 km in NW direction. • Dhaulinaag Temple, 1.23 km in S direction

Table no 2.3 –Area Details

Name of land use	Forest land (Ha.)	Agricultural Land (Ha.)	Waste Land (Ha.)	Grazing Land (Ha.)
Pits and Qaurries	-	0.427	-	-
Waste dump	-	-	-	-
Habitation	-	-	-	-
Foot Track/PWD road	-	0.060	-	-
Drainage	-	-	-	-
Remaining Undisturbed area	-	3.297	-	-
Total		3.784		



Fig 2.1- Pillar Coordinate Map

2.5 TOPOGRAPHY

The lease area comprises of terraced agricultural fields showing undulating topography. The slope of area is gentle (9 to 15°) is towards south to north direction. The higher levels are found towards the eastern side of the area near boundary pillar 1 whereas the lowest horizons within the area are found near boundary pillar 6. The highest & lowest levels found in the area are of 1492.45 mRL to 1401.85 mRL respectively. The slopes in hill area vary from moderate to gentle. The drainage pattern of the area is dendrites in pattern & in first & second order. The area is infertile in nature.



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Climate: Climatically the area falls in temperate zones with pleasant summer & extreme cold winters. The area receives moderate snowfalls during winters between January & February. The maximum temperature goes up to 35°. While the average minimum temperature goes up to 2° to 4° in the months of January & February.

2.6 GEOLOGY

Regional geology-

District Bageshwar is mainly represented by the rocks of Lesser Himalaya and Central Himalaya. The geological set up is very complex due to the repeated tectonic disturbances caused by different orogenic cycles. Valdiya (1980) carried out extensive geological and structural mapping in the area. The salient features of geology are depicted in the geological map of Bageshwar district. The map is based on Geological Survey of India, 2002. The rock units exposed in various parts of Bageshwar district comprise current-bedded quartzite with associated volcanic, mica-talc schist, limestone, conglomerate, slate, quartzite, granodiorite, augen gneiss, and migmatites and granite gneiss. Many areas in the northern part of the district are yet to be mapped by conventional field methods due to inaccessibility and permanent snow cover.

The rock units exposed in various parts of Bageshwar district comprise current-bedded quartzite with associated volcanics, mica-talc schist, limestone, conglomerate, slate, quartzite, granodiorite, augen gneiss, and migmatites and granite gneiss. Many areas in the northern part of the district are yet to be mapped by conventional field methods due to inaccessibility and permanent snow cover. However a group of regionally metamorphosed rocks known as the Central Crystallines are exposed in this area. The Central Crystallines of the Central Himalayan Zone occur as thrust sheets over the metasedimentary and sedimentary rocks of Lesser Himalayan Zone in varied tectonic settings. Major rock types of Central Crystallines are migmatites, psammitic and mica gneiss, calc gneiss, quartzite, marble, mica schist and amphibolites. Granites of different ages ranging from Paleoproterozoic to Mesozoic-Tertiary intrude the Central Crystallines. Major parts of Bageshwar district falls under the geotectonic zone known as

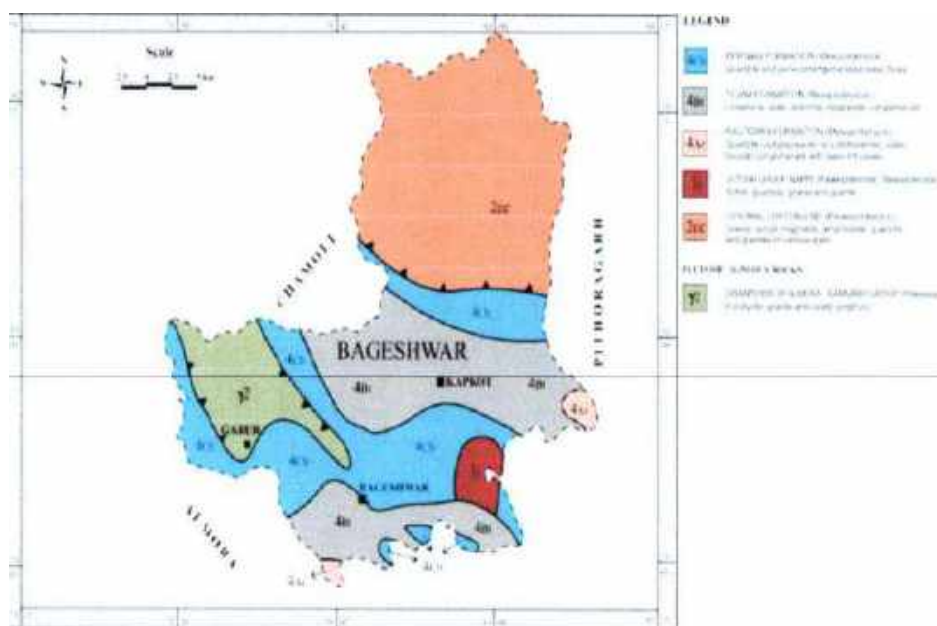


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the Lesser Himalaya. Rock types in the Lesser Himalayan Zone include sedimentaries, metasedimentaries and plutonic igneous rocks.

Geological framework of Almora-Bageshwar regions is so wide where that region is divided in different litho-tectonic units. The geology of the area consists of three Stratigraphic and tectonic units, namely (a) The Central Crystalline, (h) The Baijnath Crystalline and (c) The Garhwal Group. In the north the Dicta-sedimentary rocks of the Garhwal group have been thrust over by the Central Crystalline and the contact is known as the Main Central thrust. In the south the Kausani thrust separates the Garhwal group from the physically overlying Baijnath Crystalline. In the central part of the Bageshwar region there are rocks of Garhwal group is found to expose. On the basis of previous works by Heim and Gansser (1939) and Gansser (1964) gave an account of different litho logical units and structural trends, with regional interpretations in the Kumaon Himalaya. Rocks of the central part of the Bageshwar region is remarked as a part of "The Cale zone of Tejam".



The first geological map of the area was published by Misra and Banerjee (1968). Subsequently it was revised by Misra and Bhattacharya (1972), after that work has been carried out by A. Ahrnad (GSI, 1975), A.R. Bhattacharya (1979) and besides those workers KS. Valdiva (1980 contribution in the account of the Geology of the region.

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The area forms the part of Calc Zone of Tejam. The stratigraphical sequence of the region as per monumental work (Geology of Lesser Himalayas; 1980 of Prof. K.S. Valdiya is as below:

Group/Formation	Lithology
Berinag Formation	Quartzite, Meta quartzite, Longlomerate, Phyllite
~~~~~Unconformity ~~~~~	
Gangolihat Dolomite	Dolomite and dolomitic limestone with algal structures. Magnesite with minor talc/talcosephyllite and dolomite intercalations
~~~~~Unconformity ~~~~~	
Sor Slates	Shales, Slates and Phyllites

The above Stratigraphic sequence as observed in this region is considered to be an inverted one. Soapstone pockets/lenses occurs within carbonates of Gangolihat Dolomite.

Local Geology-

Locally the area only shows the part of carbonates of Gangolihat Dolomite sequence. The local stratigraphy shows that the mineralized zone lies between upper & lower carbonates as below- Upper Carbonates: Magnesite sporadic dolomite

Middle Talcose phyllite: Talc in pockets

Lower Carbonates: Dolomite & dolomitic intercalations

As per UNFC, the deposit is lenticular of all dimensions, UNFC category IV

Alluvial Cover: A thin layer of brownish color of soil exists in the whole area. The thickness of soil varied between 1.10 to 1.30m.



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Soapstone bearing with Magnesite:

The soapstone mineral in Kumaon Himalaya is an alteration a products magnesium bearing minerals, soapstone occurs as pocket type massive and sometimes confined to the upper part of the magnesium bearing zones. The mineral body occurs in irregular shape & size. The foliation plane of soapstone trending about 330°N to 340°N, amount of dip varies 30 degree to 35 degree, direction varies 50°N to 55°N.

(II) Contact of Litho Units/rock types traced inferred:-

The lease area is terrace hill agriculture land with soil cover. No contacts of litho units/rock types been observed on the ground level.

(III) Attitudes like strike and dip available in adequate numbers:-

Applied area is mostly covered with the soil cover.

(IV) Structural features such as joints, folds, faults and their attitudes:-

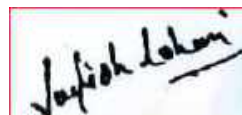
No structural features observed within the lease area.

(V) Delineation of mineralized/ore zones with definite demarcation of observed and inferred:-

Mineralization zone delineate with the help of pits and existing mining surrounding the area.

Drainage Pattern

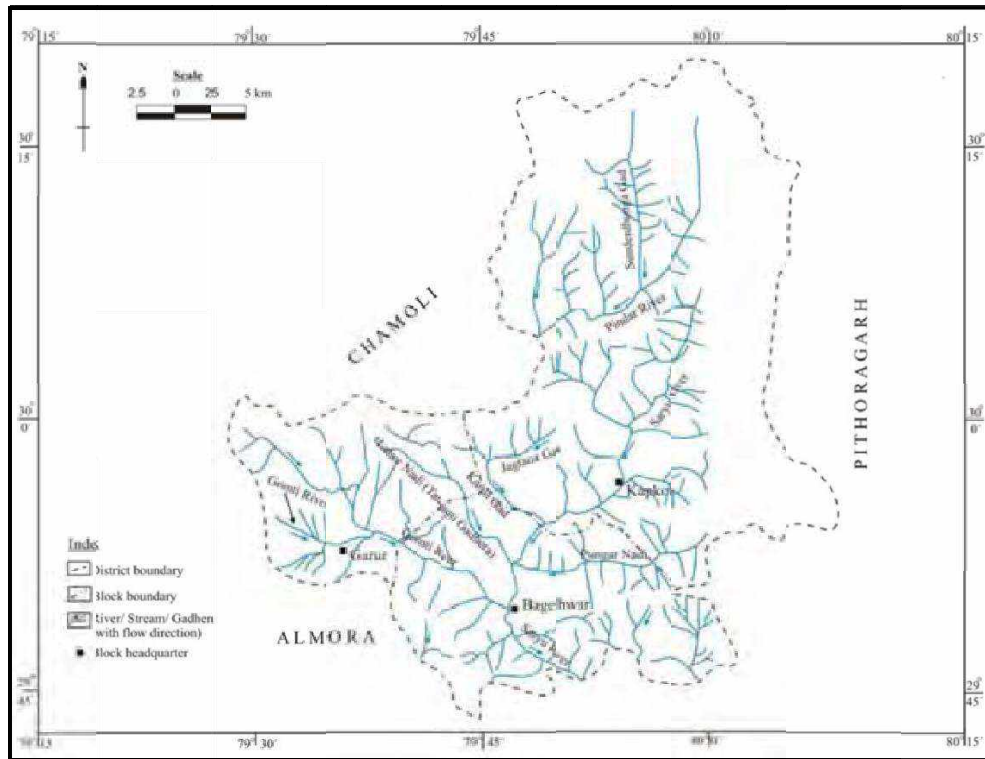
One Seasonal drainage exists within lease area towards SW to NE & meet first order drainage exist outside the lease area which flowing West to North East flank and another drainage exist outside the area towards SW to NE & meet the river Pungar River which is the main catchment of the area. The surrounding area is characterized by steep slopes, narrow ridges & forms the mountainous topography & raining water flow through the slope & meet the drainages. The water catchment of buffer zone is divided into Pungar River which is the main catchment of the area. The area receives 70% on an average rain fall in between June & to mid-September. Average rain fall from June to September



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comes out 1000mm. Retaining wall along the waste dumps and check dams across the drainage shall be provided for the arresting of solid waste.



2.7 RESERVE ESTIMATION

RESERVE

Details of prospecting/ exploration already carried out

The area was explored with help of three exploratory pits up to depth of 4m to 9m and soapstone was encountered in all trial pits. The exploration was carried out in scattered manner as per the consent of land owners. Therefore, exploration was not carried out in grid pattern and in proper spacing. The details of exploration already undertaken within the area are given below:-

Exploratory Pit Points	Length (M)	Width (M)	Thickness	Lithology	Status	Location
EP-1	22	11	0-1.20m	-Soil Cover	Backfilled	Between the



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Signature of Jyoti Lohani

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			1.20-9m	-Soapstone bearing with low grade magnesite		Local coordinate N-1070 to N-1081 and E-1213 to E-1068
EP-2	24	10	0-1.20 1.20-9.5m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1208 to N-1218 and E-1175 to E-1199
EP-3	25	12	0-1.20 1.20-8.6m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1260 to N-1272 and E-1074 to E-1099
EP-4	24	12	0-1.20 1.20-8m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1362 to N-1374 and E-1088 to E-1112

Exploration proposed to be carried out (in case adequate total reserves is not established for the tenure of lease)

During next five years, the unexplored area shall be explored with three trial pits having dimension 5m x 5m x 5m to ascertain the continuity and grade of soapstone. The year wise exploration program is given below:-

Year	No. of trial pits	Location
Five Year	PT	In between the local coordinates N 1090 to N 1095 & E 1230 to E 1235
	PT	In between the local coordinates N 1230 to N 1235 & E 1178 to E 1182



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	PT	In between the local coordinates N 1300 to N 1301 & E 1082 to E 1087
--	----	--

Method of estimation of reserve

The geological reserves have been estimated as per UNFC in all the three axis is as below

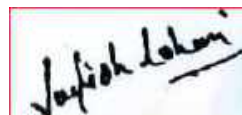
Economic Axis (E-1):

1. Due to mining in surrounding area, the mineral is good grade & having no problem in selling in the market. Mineral shall be transported manually up to road side & loaded in to trucks. NOC from individual land owners have been obtained. Extraction & sale has been confirmed or there are reasonable expectations that all such approvals will be obtained within a reasonable time frame. Economic viability is not affected by short term adverse market conditions provided that longer term forecasts remain positive. On this basis economic viability of the deposit has been established & mineral is economically viable. Therefore economic axis has been considered as E-1.
2. General exploration laterally as well as in depth by way of pitting.
3. Prospecting report has been prepared under rule 16 of MCR1960.
4. Specific end use grade of reserve established. The reserves of soapstone with in lease area are cosmetic, paper & detergent grade.
5. The land use data of nearby area is available. The applied lease area is totally agriculture land & after mining it shall be backfilled, leveled & ready use for agriculture.

Prefeasibility axis (F-2):

This is small semi mechanized mine. The prefeasibility study has been carried out for this area & is considered to be prefeasibility status. Therefore prefeasibility axis under UNFC for the deposit is F=2

1. **Geology:** Local Geology, mineralogy & geometry of soapstone deposit with in lease area established during prospecting operations. The identification of ore body carried out & only soapstone was formed occur within the lease area.
2. **Mining:** the mining will be worked out by semi-mechanized method. The production &



development plan prepared & appended. The estimation of manpower has been carried out.

3. **Environment:** Base line data on environment & land use data etc has been generated.
4. **Processing:** No processing is proposed.
5. **Infrastructure & Services:** Site services such as rest shelter, first aid room, drinking water facilities etc will be provided in compliance of Mine Act-1952 & Mine Rules 1955. Construction activities are proposed, to be commenced very soon.
6. **Costing:** Capital cost & operating cost has been evaluated based on comparable mining operations as appended in prefeasibility.
7. **Marketing:** the soapstone of the area is proposed the supply to various industries like ceramic, paper, cosmetics etc.
8. **Economic viability:** the mineral is economically viable.
9. **Other Factors:** statutory provisions relating to land has been complied while layout,mining & taxation etc would be comply during the course of mining.

Geological Axis: G-1

Mapping on the scale of 1:1500 on G1 proved category has been marked.

Geo chemical survey: Sampling from out crops carried out.

Geological Survey:

- 1- Mapping in the scale of 1:1500 & bench marks carried out & shown in surface geological plan. Extensive pitting has been done & nature of deposition of soapstone has been shown on geological plan & section.
- 2- Linking of map with cadastral map carried out & latitude & longitude of corner pillar taken.
- 3- Assessment of lithology carried out based on the exposures in the pit of soapstone, structure & surface mineralization study & mapped during prospecting period.

Geochemical survey: Detailed sampling from pits.

Geophysical survey: Geophysical survey was carried on the basis of exposure and outcrops. The mineralization zone delineated.



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Technological: Extensive pitting carried throughout the lease area. Depth of pits varies 4m to 9m.

The UNFC consists of a three dimensional system i.e. three axes: Geological Assessment, Feasibility Assessment and Economic viability. The process of geological assessment is generally conducted in stages of increasing details. The typical successive stages of geological investigation i.e. reconnaissance, prospecting, general exploration and detailed exploration, generate resource data with a clearly defined degrees of geological assurance. These four stages are therefore used as geological assessment categories in the classification. Feasibility assessment studies form an essential part of the process of assessing a mining project. The typical successive stages of feasibility assessment i.e. geological study as initial stage followed by prefeasibility study and feasibility study/mining report are well defined. The degree of economic viability (economic or sub economic) is assessed in the course of pre-feasibility and feasibility studies. Prefeasibility study provides a preliminary assessment with a lower level of accuracy than that of a feasibility study, by which economic viability is assessed in detail.

Parameters of Estimation:

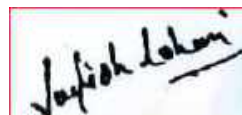
- 1- The cross section area of each section line has been calculated for each category of reserves. The cross sectional area is multiplied by the strike influence to get the volume. The volume is multiplied by the bulk density to get the tonnage in each section line. Geological cross section is enclosed as **Plate No.-5**.
- 2- In order to calculate the mineable reserve the geological map on the 1:1500 scale was prepared and main litho units were marked on the plan to know the surface spread of each unit.
- 3- Bulk density of soapstone has been assumed 2.6 in view of our past experience in and around the area.
- 4- All the quantities of soapstone up to 200m horizontal extension from exploratory pit & depth 9m from surface have been considered under 111.
- 5- All the quantities of soapstone occurring 3m vertically below the proved mineral reserve has been considered as 121.



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- 6- All the quantities of mineral up to depth of 9m from surface with in restricted zone have been considered as 211.
- 7- All quantities of mineral below 3m from 211 have been considered as 222.
- 8- Bulk density of interburden (Magnesite) has been assumed as 2.6 in view of our past experience in the area.
- 9- The occurrence of soapstone has been taken as 40% of the total excavation as per past experience in the area.
- 10- Recovery of interburden (Magnesite) has been taken as 60% of the total excavation as per past experience in this region.
- 11- Based on exploration within this area & mining activities in surrounding regions, it has been revealed that occurrence of soapstone varies 35% to 45%. Therefore on an average occurrence of soapstone has been considered 40% of total excavation.
- 12- Generally small quantities of magnesite interlocked with soapstone that is inseparable so 5% of total recoverable soapstone has been considered as mining losses.
- 13- Besides above assumed parameters in this Mine Plan for First Five year it is assessed during the exploration of this project area by RQP that the soapstone deposit is in tremendous quantity and somewhere wide spread in nature/thick manner without overburden/soil profile.

PROVED MINERAL RESOURCES (111)				
Section Line	Area m.sq. (111)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			111	111
1-1'	630	60	37800	37346
2-2'	1332	70	93240	92121
3-3'	1278	70	89460	88386
4-4'	630	65	40950	40458
Total	3870		2,61,450	2,58,311



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 Tehsil- Kanda & District-Bageshwar,
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 Area: 3.784 Ha

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PROBABLE MINERAL RESOURCES (121)				
Section Line	Area m.sq. (121)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			121	121
1-1'	160	60	9600	8985
2-2'	414	70	28980	28632
3-3'	402	70	28140	27802
4-4'	192	65	12480	12330
Total	1168		79,200	77,749

FEASIBILITY MINERAL RESOURCES (211)				
Section Line	Area m.sq. (211)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			211	211
1-1'	80	60	4800	4742
2-2'	86	70	6020	5947
3-3'	78	70	5460	5394
4-4'	80	65	5200	5137
Total	324		21,480	21,220

PREFEASIBILITY MINERAL RESOURCES (222)				
Section Line	Area m.sq. (222)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			222	222
1-1'	72	60	4320	4268
2-2'	66	70	4620	4564
3-3'	69	70	4830	4772
4-4'	68	65	4420	4366
Total	275		18,190	17,970



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The mineral reserves/resources calculated within lease areas per UNFC is as below:-

Mineral Reserve	UNFC Code	Quantity in million Tons	Grade
A. Total Mineral Reserve			
Proved Mineral Reserve	111	2,58,311	Cosmetic paper
Probable Mineral Reserve	121	77,749	Cosmetic paper
B. Total Remaining Resources			
Feasibility mineral Resources	211	21,220	Cosmetic paper
Prefeasibility mineral Resources	222	17,970	Cosmetic paper
Measured mineral Resources	331	-	-
Indicated mineral Resources	332	-	-
Inferred mineral Resources	333	-	-
Reconnaissance mineral Resources	334	-	-
Total (A+B)	-	3,75,250	-

2.8 PROPOSED METHOD OF MINING

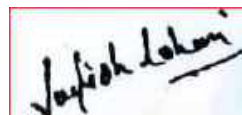
Briefly describe the existing/proposed method for developing/working the deposit with all design parameters:

(I) Existing Method of mining:

It is fresh application for mining lease & mining operations yet to be commenced.

(II) Proposed method of mining:

It will be opencast Semi-Mechanized mine. The overburden & interburden shall be removed by means of excavator. The soapstone shall be extracted with the help of excavator as well as manually with the help of hand tools like crow bar, chisels, pickaxe, hammers, and spade. Different grade of soapstone will be stacked separately near the mining faces. The soapstone shall be dressed manually &



stacked separately. No further beneficiation shall be undertaken during first five years.
The different grade of soapstone will be filled into 50 kg plastic bags & transported the road side by mules.

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

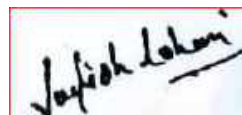
- Mining shall be carried out in two pits.
- It will be opencast mechanized method.
- Average thickness of soil has been considered as 1.20 m & it shall be stacked separately.
- Top soil, overburden & interburden shall be removed by means of excavators.
- Height & width of benches shall be kept 3m & 3m.
- Face slope of benches shall be 70° with 45° overall pit slope.
- Backfilling will be undertaken after winning the soapstone up to full economical depth. The interburden and top soil will be temporarily dump separately towards the slope of working pit and shall be used for backfilling from third year onwards. Interburden shall be filled into mined out pit and later on thin soil shall be carped over it to restore maximum original topography of the area.
- Generally small quantities of magnesite interlocked with soapstone that is inseparable in nature so 5% of total recoverable soapstone has been considered as mining losses.

YEAR WISE BUILDING STONE SOAP STONE PRODUCTION (As per LOI)

The total year wise quantities of soapstone & waste to be exploited from Pit-I & Pit-II is tabulated below:

Table 2.5- Proposed productions in mining plan period – 05 years

YEAR	PIT-I	PIT-II	TOTAL PRODUCTION SOAPSTONE (TONNES)
------	-------	--------	---



Ist	8112	2403	10,515
IIInd	8500	4594	13,094
IIIrd	7652	5818	13,470
IVth	8533	6075	14,608
Vth	7886	7540	15,426
TOTAL	40,683	26,430	67,113

First Year - Pit-I

The Production will be achieved through the opening and advancement of benches 1427m RL to 1424mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1430-1427	1483	3	5649	1780	3389	5581
1427-1424	854	3	2562	432	1537	2531
TOTAL			8211	2212	4926	8112

Pit-II

The Production will be achieved through the opening and advancement of benches 1448 m RL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1451-1448	811	3	2433	974	1459	2403
TOTAL			2433	974	1459	2403

Second Year – Pit I



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The Production will be achieved through the opening and advancement of benches 1424m RL to 1421mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1427-1424	1428	3	4284	972	2570	4232
1424-1421	1440	3	4320	-	2592	4268
TOTAL			8604	972	5162	8500

Pit-II

The Production will be achieved through the opening and advancement of benches 1445m RL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1448-1445	1550	3	4650	1210	2790	4594
TOTAL			4650	1210	2790	4594

Third Year – Pit I

The Production will be achieved through the opening and advancement of benches 1421m RL to 1418mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1424-1421	1185	3	3555	950	2133	3512
1421-1418	1380	3	4140	120	2484	4140
TOTAL			7695	1070	4617	7652

Pit - II



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The Production will be achieved through the opening and advancement of benches 1442mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1445-1442	1963	3	5889	614	3533	5818
TOTAL			5889	614	3533	5818

Fourth Year- Pit I

The Production will be achieved through the opening and advancement of benches 1418m RL to 1415mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1421-1418	1159	3	3477	615	2086	3435
1418-1415	1720	3	5160	205	3096	5098
TOTAL			8637	820	5182	8533

Pit - II

The Production will be achieved through the opening and advancement of benches 1442m RL to 1439mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1445-1442	810	3	2430	1080	1458	2400
1442-1439	1240	3	3720	-	2232	3675
TOTAL			6150	1080	3690	6075



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Fifth Year- Pit I

The Production will be achieved through the opening and advancement of benches 1415mRL to 1409mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top Soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1418-1415	430	3	1290	454	774	1274
1415-1412	1491	3	4473	483	2683	4419
1412-1409	740	3	2220	-	1332	2193
TOTAL			7983	937	4789	7886

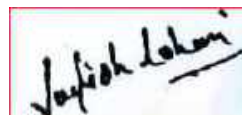
Pit - II

The Production will be achieved through the opening and advancement of benches 1439mRL to 1436 mRL. The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1442-1439	1520	3	4560	492	2736	4505
1439-1436	1024	3	3072	-	1843	3035
TOTAL			7632	492	4579	7540

2.9 DRILLING AND BLASTING

Soapstone is soft minerals, its hardness has been considered as 1 on moh's hardness scale which can be mined easily therefore, there is no need of drilling and blasting for soapstone mining.



2.10 CONCEPTUAL MINING PLAN

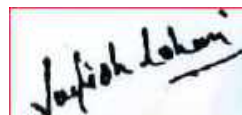
It is a fresh applied lease area but for systematic and scientific mining operations, proposed site of dumps, plantation and site services etc. need to be considered. Accordingly, Mine Closure Plan has been prepared for the applied lease area. It is proposed to work the deposit by open cast mechanized method for 5 years to exploit the mineral to its fullest extent. At the end of the life of mine the applied lease area will be partially backfilled and remaining area will be converted into water reservoir. Plantation (33% of total area) will be carried out within statutory barrier and outside the applied lease area in the land of village Panchayat.

The impact on land form or physiography will be land use on the hilly terrain will undergo radical changes due to the open cast mining. During the first five years mining, land will be degraded due to mining & allied activities. The breakup of the land to be affected during the first five years due to mining operation is given as below-

Activities	At Present (Ha)	At the end of Plan Period (Ha)
Pits and Quarries	0.427	1.127
Waste Dump	-	-
Habitation	-	-
Foot Track/PWD road	0.060	0.080
Drainage	-	-
Remaining Undisturbed area	3.297	2.577
Total	3.784 Ha	3.784 Ha

Ultimate Pit Limit:

It is proposed to work the deposit by open cast semi mechanized method. Considering, the hardness of the mineral, the Ultimate Pit Limit has been drawn up to 1510 mRL. The ultimate size of the pit will be of 181 m x 70 m. The Ultimate Pit will be partially backfilled & remaining area will be converted into water reservoir.



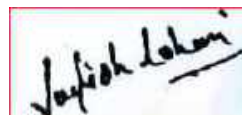
S. No.	Length (in m)	Width (in m)
1.	181	70

2.10.2 Nature of Waste

The top soil from the working benches will be removed by means of an excavator and stacked separately and used for backfilling from second year onwards. The interburden is low grade magnesite and shall be removed manual means and to be dumped separately and used for backfilling from third year onwards. The top soil and interburden material will be dumped separately on mineralized land, but these dumps are temporary in nature and it will be used in reclamation purpose. The yearly generation of soil and inter burden is given below:-

Year	Pit I	
	Top Soil (cum)	Interburden (cum)
1 ST Year	2212	4926
2 ND Year	972	5162
3 RD Year	1070	4617
4 TH Year	820	5182
5 TH Year	937	4789
Total	6011	24676

Year	Pit II	
	Top Soil (cum)	Interburden (cum)
1 ST Year	974	1459
2 ND Year	1210	2790
3 rd Year	614	3533



4 TH Year	1080	3690
5 TH Year	492	4579
Total	4370	16051

The top soil shall be scraped & preserved for short period towards the slope side along the working pits. Dumping shall be carried out in single terrace & slope of dump shall be kept 35⁰ to 40⁰. All the quantities shall be used in backfilling before the commencement monsoon period. Therefore no proposal has been envisaged for its separate dumping at mine side. Before the commencement of monsoon all the pits shall be backfilled.

2.11 UTILITIES

2.11.1 Water

The water requirement will be around **9.56 KLD**. About 0.38 KLD for domestic and 5.0 KLD will be required for dust suppression. Water for drinking purpose will be supplied from the Uttarakhand Jal Sansthan and naulla's of nearby villages. This water will be supplied by private tankers. For dust suppression and Plantation the water supplied from nearby naulla's and treated water.

Table 2.6- Water Demand

S.NO.	Purpose	Manpower/Area	Water Demand (KLD)	Source
1.	Drinking	Manpower (38) 38*10L =380 lpcd	0.38	Nearby village naulla's
2.	Plantation	1900 trees *2L = 3800L	3.8	Private tanker
3.	Dust Suppression	Length= 500m Width= 5m Area= 500x5 =2500m ² 2500*2L =5000 lpcd	5.0	Private Tanker
4.	Toilet	Manpower (38) 38*10L =380 lpcd	0.38	Nearby village naulla's

Total	9.56	
--------------	-------------	--

2.11.2 Manpower

The details of personnel to be employed are given below:

S. No.	Category (Full Time)	Numbers
1.	Geologist/Consultant Geologist	1
2.	Part time medical officer (1)	-
3.	Part time Environment Consultant (1)	-
4.	Mining Engineer/Mine Manager	1
5.	Supervisor/Skilled workers	2
6.	Unskilled	34
	Total	38

2.11.3 Machinery

Mining is proposed by semi mechanized method. Proposal for use of machineries for the excavation and handling of mineral, overburden within the lease area.

One Hydraulic Excavator of 1.9 cum capacity will be used for excavation of mineral & waste. The mineral will be transported by Dumper of capacity 9-10 T. Water Pump of 10 HP capacity will be used for dewatering from pit in case of sudden rainfall.

2.11.4 Use of Mineral

Soapstone finds its uses in all aspects of life and commercial business. Soapstone has wide Applications across various industries. The soapstone shall be used in paper & detergent Industries. The applicant shall supply raw soapstone lumps to various buyers situated at Haldwani.

2.12 STATUTORY REQUIREMENTS



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It is accepted that effective resource management cannot be done in isolation. The proponent therefore vigorously pursues approaches towards coordination and integration where possible, so as to lead to coordinated regulatory systems.

Restriction on mining:

- As per the Uttarakhand mining policy no mining operation shall be carried out within
- 100 m of railway line & bridge.
- The mining will not intercept the ground water table.
- The contractors will abide by Uttarakhand Minor Mineral Concession Rules, 2001 and guidelines contained in the River/Stream Bed Mining Policy and Land forms studies were taken into consideration.
- The contractors will abide at the time of mining with the term and condition as laid down under Mines Act, 1952 and Mines & Minerals (Regulation and Development) Act, 1957, Forest (Conservation) Act, 1980 and the stipulations of the EIA/EMP.
- The contractor will abide by provision of Mines Act, 1952, Interstate Migrant Work Man Act, the contractor with the satisfaction of competent authority will provide drinking water, rest shelter, first aid box, welfare facilities as Central and State Govt. labor laws.

Various acts dealing with matters relating to the conservation and protection of the environment and which a holder of a mining authorization must also take cognizance of include inter alia, the following:

- The Mines Act, 1952
- The Mines and Mineral (Development and Regulation) Act, 1957
- The Mines and Mineral (Development and Regulation) Act, 2015
- Mines Rules, 1955
- Mineral Concession Rules, 1960
- Metalliferrous Mines Regulations 1961
- Mineral Conservation and Development Rules, 1988



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- Mineral Conservation and Development Rules, 2015
- State Minor Mineral Concession Rules, 1963
- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Forest (Conservation) Act, 1980
- The Wildlife (Protection) Act, 1972
- Uttarakhand Minor mineral Concession rules, 2001



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CHAPTER -3

DESCRIPTION OF THE ENVIRONMENT

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Village: Garuwa Sirmoli
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DESCRIPTION OF ENVIRONMENT



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3.0 INTRODUCTION

Information on the existing environmental status is essential for assessing the likely environmental impacts of the project. 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. This section contains the description of baseline studies of the 10 km radius of the area Garuwa Sirmoli Soapstone Mining Project located at, Village- Garuwa Sirmoli, Tehsil- Kanda and District- Bageshwar State-Uttarakhand, and Area – 3.784 Ha. & Maximum Proposed Production 15,426 tonnes /annum (in Vth year). The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed.

3.1 BASELINE DATA

Baseline environmental data generation for air, water, noise and soil quality monitoring has been conducted at project site and other locations from October 2022 – December 2022.

Climate-

The climate in Bageshwar district is temperate to sub-humid. The northern part of district experiences sub-zero temperature almost throughout the year whereas the central and southern parts are comparatively warm and humid. Severe winter is the chief climatic feature in the district. In general, the district experiences a tropical to sub-tropical and sub-humid climate except for the northern part where a cold temperature climate prevails.

Temperature, Relative Humidity and Wind-

January is the coldest month with mean maximum temperature of 10°C, the mean minimum temperature being about 2°C. Temperature drops down to 6°C during January and February in the northern part of the district. June is the warmest month with the mean maximum and the mean minimum temperatures of 25°C and 15°C respectively. The maximum temperature recorded in the district was 43°C (May 2003) whereas the minimum temperature recorded was 4°C (January 2021).

The relative Humidity increases rapidly with the onset of monsoon and reaches at about 80% during July to September. The driest part of the year is the pre-monsoon period, when the humidity is as low as 30% in the afternoons. Skies are heavily clouded during the monsoon

months and for short spells when the district is affected by Western Disturbances. Two broad wind pattern are observed in the district viz north easterly to easterly (May to September) and south easterly to westerly (October and March).

Rainfall-

Most of the rainfall, about 75% of the annual value, occurs during monsoon months of June to September. July is the rainiest followed by August. In September, depressions from Bay of Bengal occasionally reach Uttarakhand and affect the weather of Bageshwar District also. The phenomenon may cause heavy rains. With the withdrawal of monsoon in September, the intensity of rainfall rapidly decreases. The decrease continues till November, which is a practically rainless month. Winter precipitation is associated with the passage of the western Disturbances and is in the form of snowfall over higher elevations. The monthly and annual average rainfall data of District Bageshwar in year 2017, 2018, 2019, and 2020 is 1697mm, 1157.38mm, 1241.52mm and 1346.34mm respectively. Maximum rainfall occurred in July 2021 is 1684.05mm.

3.1.1 LAND ENVIRONMENT

Land-Use/land cover pattern of the study area delineating all the features has been studied through satellite imagery. It is a fresh applied lease area. The lease area comprises of terraced agricultural fields showing undulating topography. The slope of area is gentle (9 to 15°) is towards south to north direction. The higher levels are found towards the eastern side of the area near boundary pillar 1 whereas the lowest horizons within the area are found near boundary pillar 6. The highest & lowest levels found in the area are of 1492.45 mRL to 1401.85 mRL respectively. The slopes in hill area vary from moderate to gentle. The drainage pattern of the area is dendrites in pattern & in first & second order. The area is infertile in nature.

3.1.2 AIR ENVIRONMENT

The prime objective of the baseline study with respect to ambient air quality is to establish the present air quality and its conformity to National Ambient Air Quality Standards. This data has been further used during impact assessment to predict the final air quality. Ambient air quality monitoring stations were selected primarily on the basis of surface influence, demographic influence and meteorological influence. 24 hourly monitoring was carried out

for SO₂, NO₂, and PM₁₀ & PM_{2.5} twice a week at each station. This study was done during post monsoon season for a period of 3 months (October – December 2022).

Method of monitoring

The Central Pollution Control Board (CPCB) has published comprehensive document on emission testing regulations (“Emission Regulations Part-3, 1985”). Those procedures relevant to the particulate monitoring are summarized below:

Table 3.2 (i): Methods adopted for PM₁₀, PM_{2.5}, SO₂, and NO₂

Parameters	Technique	Technical Protocol	Minimum Detectable Limit
PM _{2.5}	Gravimetric method	CPCB Guideline Vol. I May’ 2011	5 (µg/m ³)
PM ₁₀	Gravimetric method	IS 5182 (Part-XXIII)	5 (µg/m ³)
Sulphur Dioxide	Improved West and Gaeke	IS-5182 (Part-II)	5 (µg/m ³)
Nitrogen Dioxide	Modified Jacob & Hochheiser	IS-5182 (Part-VI)	6 (µg/m ³)

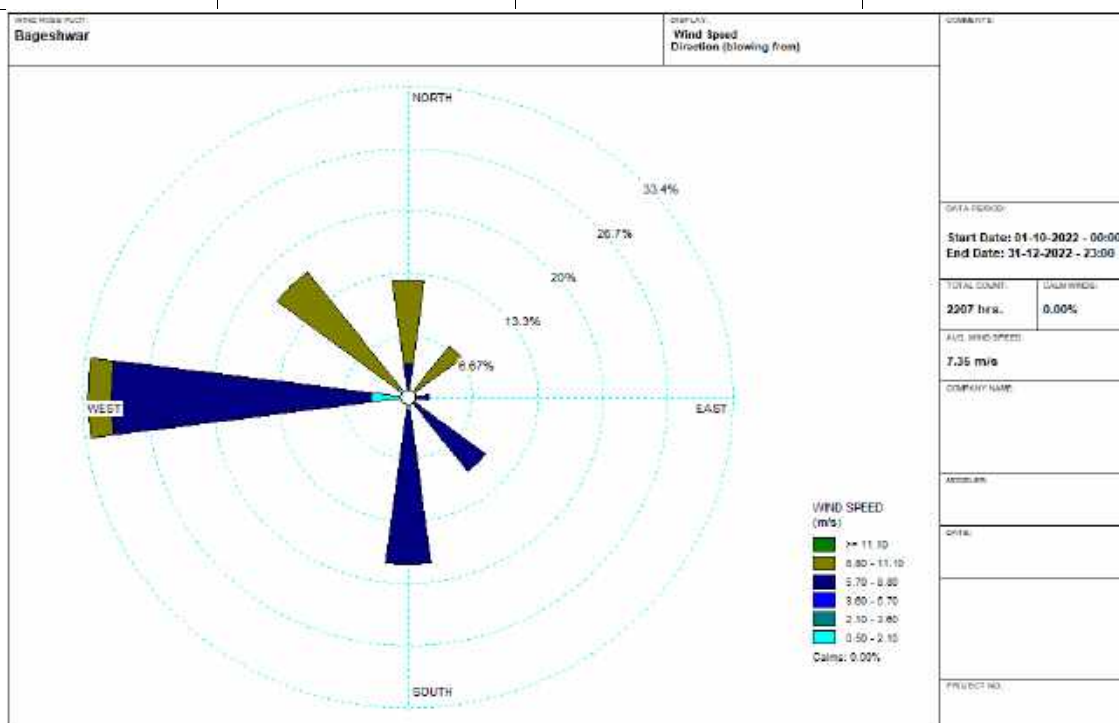


Fig 3.1 – Wind rose Diagram

Equipment Calibration: For accurate testing of emission sources, the components of the sampling train is calibrated by outsource and supplier (Master Calibrator) standards and solutions are used, calibrated under certified reference material. The Ambient air quality monitoring locations are marked in Map. The ambient air quality data were collected to find the existing GLC.

To quantify the impact of the project on the ambient air quality, it is necessary at first to evaluate the existing ambient air quality of the area. The existing ambient air quality, in terms of Particulate Matter – 10 (PM₁₀), Particulate Matter- 2.5 (PM_{2.5}), Sulphur-dioxide (SO₂) and Oxides of Nitrogen (NO₂), has been measured through a planned field monitoring. Table 3.2(ii) gives location of the ambient air quality monitoring stations.

Table 3.2 (ii) Ambient Air quality monitoring stations

Location Code	Location	Direction	Distance	Project area/Study Area
AAQ1	Project Site	E	0.05 km	Project Area
AAQ2	Garuwa Sirmoli	NNE	0.16 km	Study Area
AAQ3	Adhyali	SE	0.30 km	Study Area
AAQ4	Kanda	S	0.29 km	Study Area
AAQ5	Chhana	SW	0.17 km	Study Area
AAQ6	Jhakra	E	1.31 km	Study Area
AAQ7	Bamroli	N	2.12 km	Study Area
AAQ8	Khantoli	S	1.16 km	Study Area

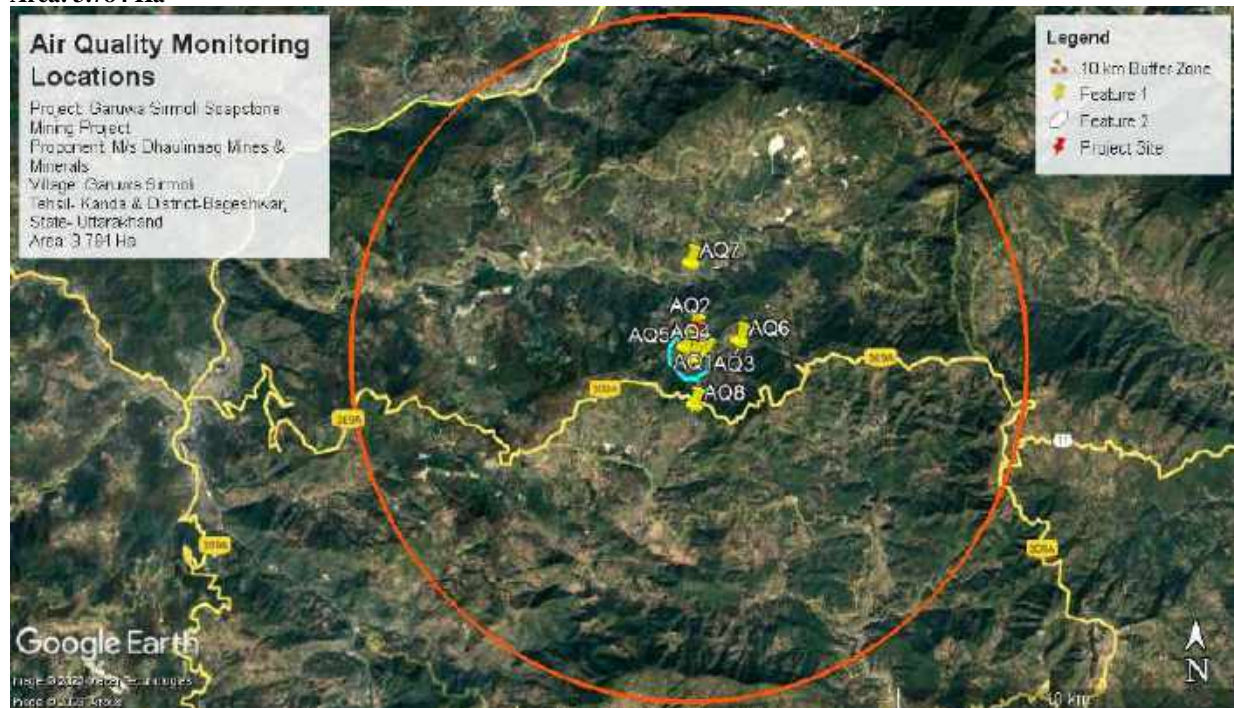


Fig 3.2 (a) Air Quality Monitoring Locations

Table 3.2 (iii): Ambient Air Quality Status

Ambient Air Quality Data October – December 2022				AQ-1 Near Project Site	
S.No	Date	PM 2.5, µg/m3	PM10, µg/m3	SO2 µg/m3	NOx, µg/m3
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	38.3	70.36	6.8	11.9
2	04.10.2022	37.9	70.48	8.4	7.5
3	08.10.2022	32.4	62.38	10.9	7.8
4	12.10.2022	34.8	70.65	7.6	13.3
5	16.10.2022	23.7	61.69	6.9	15.1
6	20.10.2022	31.6	62.49	4.9	12.5
7	24.10.2022	42.0	38.5	4.1	11.9
8	28.10.2022	29.5	60.45	5.5	5.9
9	01.11.2022	22.9	39.65	7.5	7.8
10	04.11.2022	44.4	55.98	8.9	14.7
11	08.11.2022	30.2	54.54	9.4	9.8
12	12.11.2022	26.9	51.0	11.4	16.6
13	16.11.2022	32.5	67.75	5.2	13.6
14	20.11.2022	50.7	50.81	8.9	17.2
15	24.11.2022	33.7	52.54	3.1	8.9
16	28.11.2022	42.2	69.12	7.5	19.4
17	01.12.2022	51.5	41.50	8.2	9.6
18	04.12.2022	36.5	65.70	7.6	10.8
19	08.12.2022	41.8	50.40	5.2	16.7
20	12.12.2022	29.8	51.82	6.0	14.3
21	16.12.2022	42.9	56.45	4.2	10.6

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22	20.12.2022	41.1	55.43	6.6	10.9
23	24.12.2022	40.1	42.23	3.5	15.3
24	28.12.2022	37.2	62.54	2.1	14.8
	Min	30.5	38.5	2.1	5.9
	Max	51.5	70.65	11.4	19.4
	Average	35.62	56.85	6.68	12.37
	98 Percentile	51.13	70.57	11.17	18.39
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-2 Garuwa Sirmoli	
S.No	Date	PM_{2.5}, µg/m³	PM₁₀, µg/m³	SO₂ µg/m³	NO_x, µg/m³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	37.3	72.36	9.8	11.9
2	04.10.2022	33.9	69.48	6.4	6.5
3	08.10.2022	32.4	68.38	10.9	5.8
4	12.10.2022	31.8	71.65	8.5	13.3
5	16.10.2022	35.7	62.69	7.9	15.1
6	20.10.2022	36.6	67.49	5.5	12.5
7	24.10.2022	40.0	66.5	6.9	14.9
8	28.10.2022	41.5	62.45	5.2	5.9
9	01.11.2022	49.9	54.65	7.4	7.8
10	04.11.2022	42.4	55.98	8.9	20.7
11	08.11.2022	44.5	54.54	4.8	4.8
12	12.11.2022	37.9	51.0	11.4	16.6
13	16.11.2022	32.5	48.75	5.6	11.6
14	20.11.2022	51.7	52.81	9.9	15.2
15	24.11.2022	35.7	50.54	3.8	8.9
16	28.11.2022	33.2	62.12	4.5	19.4
17	01.12.2022	31.5	60.50	8.6	9.6
18	04.12.2022	30.5	65.70	5.6	10.8
19	08.12.2022	44.8	49.40	6.1	15.7
20	12.12.2022	40.8	50.82	7.0	13.3
21	16.12.2022	42.9	51.45	4.1	10.6
22	20.12.2022	36.1	54.43	6.6	12.9
23	24.12.2022	47.1	45.23	7.5	18.3
24	28.12.2022	38.2	62.54	8.5	14.8
	Min	30.5	45.23	3.8	4.8
	Max	51.7	72.36	11.4	20.7
	Average	38.70	58.81	7.14	12.37
	98 Percentile	50.87	72.03	11.17	20.10



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NAAQS, For 24 hourly	60	100	80	80
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Ambient Air Quality Data October – December 2022				AQ-3 Adhyali	
S.No	Date	PM _{2.5} , µg/m ³	PM ₁₀ , µg/m ³	SO ₂ µg/m ³	NO _x , µg/m ³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	37.3	72.36	9.8	11.9
2	04.10.2022	5.9	70.48	5.4	8.9
3	08.10.2022	34.4	64.38	4.9	7.8
4	12.10.2022	32.8	72.65	7.5	12.3
5	16.10.2022	34.7	60.69	5.9	16.1
6	20.10.2022	31.6	65.49	4.5	11.5
7	24.10.2022	43.0	61.5	9.5	10.9
8	28.10.2022	43.5	60.45	5.8	6.9
9	01.11.2022	47.9	54.65	8.4	7.8
10	04.11.2022	43.4	55.98	9.9	15.7
11	08.11.2022	40.5	58.54	9.4	4.8
12	12.11.2022	36.9	51.0	13.4	17.6
13	16.11.2022	32.5	45.75	5.6	12.6
14	20.11.2022	50.7	50.81	5.9	16.2
15	24.11.2022	35.7	56.54	3.8	8.9
16	28.11.2022	34.2	61.12	7.5	11.4
17	01.12.2022	32.5	60.50	8.6	9.6
18	04.12.2022	34.5	62.70	9.6	17.8
19	08.12.2022	44.8	49.40	5.1	15.7
20	12.12.2022	45.8	50.82	7.0	14.3
21	16.12.2022	43.9	51.45	4.1	11.6
22	20.12.2022	40.1	55.43	5.6	12.9
23	24.12.2022	42.1	48.23	3.5	16.3
24	28.12.2022	36.2	62.54	8.5	14.8
	Min	31.6	45.75	3.5	4.8
	Max	50.7	72.65	13.4	17.8
	Average	39.37	58.48	6.97	12.26
	98 Percentile	49.41	72.52	10.71	17.71
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-4 Kanda	
S.No	Date	PM _{2.5} , µg/m ³	PM ₁₀ , µg/m ³	SO ₂ µg/m ³	NO _x , µg/m ³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	37.3	72.36	8.8	12.9



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2	04.10.2022	36.9	71.48	9.4	8.9
3	08.10.2022	33.4	65.38	10.9	7.8
4	12.10.2022	32.8	72.65	7.9	13.3
5	16.10.2022	33.7	60.69	6.5	18.1
6	20.10.2022	31.6	65.49	4.9	12.5
7	24.10.2022	46.0	62.5	5.2	15.9
8	28.10.2022	43.5	60.45	7.2	5.9
9	01.11.2022	41.9	55.65	9.4	7.8
10	04.11.2022	44.9	50.98	8.9	12.7
11	08.11.2022	40.5	54.54	12.4	8.8
12	12.11.2022	36.5	53.0	11.4	14.6
13	16.11.2022	31.9	46.50	5.6	13.6
14	20.11.2022	50.7	48.89	8.9	14.2
15	24.11.2022	38.7	52.55	3.5	8.9
16	28.11.2022	34.2	60.25	7.5	15.4
17	01.12.2022	31.5	61.50	8.5	9.6
18	04.12.2022	37.5	64.70	7.6	10.5
19	08.12.2022	44.8	50.40	5.9	15.7
20	12.12.2022	42.8	51.82	6.0	18.5
21	16.12.2022	45.9	58.45	4.9	10.6
22	20.12.2022	44.1	58.43	6.6	12.9
23	24.12.2022	46.1	44.23	3.9	16.3
24	28.12.2022	38.2	62.54	8.9	14.8
	Min	31.5	44.23	3.5	5.9
	Max	50.7	72.65	12.4	18.5
	Average	39.39	58.56	7.53	12.51
	98 Percentile	48.58	72.52	11.94	18.32
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-5 Chhana	
S.No	Date	PM_{2.5}, µg/m³	PM₁₀, µg/m³	SO₂ µg/m³	NO_x, µg/m³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	36.3	62.36	9.8	10.9
2	04.10.2022	35.9	72.48	10.4	8.5
3	08.10.2022	34.4	68.38	9.9	7.8
4	12.10.2022	35.8	71.65	7.5	13.3
5	16.10.2022	25.7	62.69	2.9	15.1
6	20.10.2022	37.6	66.49	4.5	12.5
7	24.10.2022	49.0	67.5	6.9	11.9
8	28.10.2022	21.5	62.45	5.2	5.9
9	01.11.2022	26.9	56.65	6.4	7.8
10	04.11.2022	48.4	53.98	8.9	14.7



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11	08.11.2022	35.2	54.54	8.4	4.8
12	12.11.2022	26.9	52.0	11.4	16.6
13	16.11.2022	32.5	45.75	5.6	12.6
14	20.11.2022	52.7	50.81	8.9	15.2
15	24.11.2022	30.7	51.54	5.8	8.9
16	28.11.2022	40.2	62.12	7.5	12.4
17	01.12.2022	50.5	56.50	4.6	9.6
18	04.12.2022	30.5	65.70	7.6	10.8
19	08.12.2022	45.8	51.40	5.1	14.7
20	12.12.2022	25.8	47.82	9.0	14.3
21	16.12.2022	41.9	52.45	8.1	10.6
22	20.12.2022	46.1	55.43	7.6	11.9
23	24.12.2022	47.1	48.23	6.5	15.3
24	28.12.2022	35.2	62.54	5.5	14.8
	Min	21.5	45.75	2.9	4.8
	Max	52.7	72.48	11.4	16.6
	Average	52.89	58.39	7.17	11.70
	98 Percentile	51.69	72.10	10.94	16.00
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-6 Jhakra	
S.No	Date	PM_{2.5}, µg/m³	PM₁₀, µg/m³	SO₂ µg/m³	NO_x, µg/m³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	34.3	74.36	7.8	11.2
2	04.10.2022	32.9	73.48	8.4	7.5
3	08.10.2022	32.4	60.38	10.9	7.9
4	12.10.2022	37.8	71.65	11.6	13.3
5	16.10.2022	33.7	60.69	6.9	14.1
6	20.10.2022	31.6	62.49	5.9	13.5
7	24.10.2022	40.0	37.5	8.1	12.9
8	28.10.2022	42.5	68.45	7.5	6.9
9	01.11.2022	41.9	31.65	9.5	5.8
10	04.11.2022	48.4	58.98	6.9	12.7
11	08.11.2022	40.5	53.54	5.4	9.8
12	12.11.2022	51.9	52.0	12.4	11.6
13	16.11.2022	30.5	68.75	5.5	12.6
14	20.11.2022	50.7	52.81	8.8	15.2
15	24.11.2022	34.7	53.54	3.5	8.9
16	28.11.2022	42.2	68.12	7.5	15.4
17	01.12.2022	32.5	42.50	8.2	4.6
18	04.12.2022	29.5	61.70	7.6	16.8
19	08.12.2022	43.8	52.40	5.4	14.7
20	12.12.2022	42.8	53.82	6.0	15.3



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21	16.12.2022	47.9	54.45	4.4	11.6
22	20.12.2022	45.1	52.43	6.8	12.9
23	24.12.2022	42.1	45.23	3.4	12.3
24	28.12.2022	36.2	61.54	2.5	13.8
	Min	29.5	31.65	2.5	4.6
	Max	51.9	74.36	12.4	16.8
	Average	39.41	57.19	7.12	11.72
	98 Percentile	51.35	73.96	12.03	16.16
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-7 Bamroli	
S.No	Date	PM_{2.5}, µg/m³	PM₁₀, µg/m³	SO₂ µg/m³	NO_x, µg/m³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	34.3	75.36	9.8	11.2
2	04.10.2022	36.9	70.48	5.5	8.10
3	08.10.2022	34.4	61.38	4.5	7.7
4	12.10.2022	42.8	73.65	7.9	12.9
5	16.10.2022	34.7	60.69	5.1	16.2
6	20.10.2022	41.6	65.49	4.6	11.5
7	24.10.2022	43.0	66.5	10.2	10.9
8	28.10.2022	52.5	62.45	5.9	6.5
9	01.11.2022	45.9	50.65	8.5	7.8
10	04.11.2022	48.4	54.98	9.7	15.5
11	08.11.2022	41.5	68.54	9.5	4.5
12	12.11.2022	35.9	51.0	11.1	17.6
13	16.11.2022	34.5	44.75	5.5	12.6
14	20.11.2022	51.7	50.81	5.8	16.2
15	24.11.2022	30.7	26.54	3.7	8.5
16	28.11.2022	30.2	61.12	7.6	11.4
17	01.12.2022	36.5	50.50	8.6	9.6
18	04.12.2022	37.5	62.70	9.6	18.8
19	08.12.2022	46.8	39.40	5.5	13.7
20	12.12.2022	49.8	50.82	7.0	12.3
21	16.12.2022	47.9	45.45	4.5	10.6
22	20.12.2022	41.1	55.43	5.6	11.9
23	24.12.2022	40.1	47.23	3.5	16.3
24	28.12.2022	35.2	61.54	8.9	13.8
	Min	30.2	26.54	3.5	4.5
	Max	52.5	75.36	11.1	18.8
	Average	40.58	56.56	7.00	11.92

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	98 Percentile	52.13	74.57	10.69	18.25
NAAQS, For 24 hourly		60	100	80	80

Ambient Air Quality Data October – December 2022				AQ-8 Khantoli	
S.No	Date	PM_{2.5}, µg/m³	PM₁₀, µg/m³	SO₂ µg/m³	NO_x, µg/m³
		Gravimetric	IS:5182:Pt-23	IS:5182:Pt-2	IS:5182:Pt-6
1	01.10.2022	33.3	64.36	11.8	10.9
2	04.10.2022	31.9	73.48	9.4	8.5
3	08.10.2022	35.4	67.38	8.9	7.8
4	12.10.2022	39.8	72.65	7.5	3.3
5	16.10.2022	35.7	60.69	6.9	15.1
6	20.10.2022	32.6	69.49	5.5	2.5
7	24.10.2022	45.0	68.5	4.9	11.9
8	28.10.2022	40.5	66.45	3.2	5.9
9	01.11.2022	44.9	57.65	2.4	7.8
10	04.11.2022	40.4	52.98	2.9	14.7
11	08.11.2022	51.5	54.54	8.4	4.8
12	12.11.2022	50.9	53.0	12.4	6.6
13	16.11.2022	30.9	44.75	6.6	12.6
14	20.11.2022	50.9	56.81	7.9	15.2
15	24.11.2022	34.5	52.54	8.8	7.9
16	28.11.2022	42.5	61.12	9.5	1.4
17	01.12.2022	32.5	57.50	6.5	9.6
18	04.12.2022	29.9	68.70	7.5	10.8
19	08.12.2022	43.9	52.40	5.1	14.7
20	12.12.2022	42.9	45.82	9.2	12.3
21	16.12.2022	47.5	53.45	8.2	10.6
22	20.12.2022	45.5	56.43	7.5	11.9
23	24.12.2022	42.7	47.23	6.5	12.3
24	28.12.2022	36.3	61.54	5.9	13.8
	Min	29.9	44.75	2.4	2.5
	Max	51.5	73.48	12.4	15.2
	Average	40.08	59.14	7.23	10.08
	98 Percentile	51.22	73.10	12.12	15.15
NAAQS, For 24 hourly		60	100	80	80

* **Note:** The 98th percentile is calculated statistically only to compare with NAAQ standards of short terms values.

BDL: Below Detectable Limit

Observation-

Ambient Air Quality Monitoring (AAQM) has been carried out at five locations during pre-monsoon season from October to December 2022. The minimum and maximum level of PM_{2.5}



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recorded within the study area was in the range of $21.5\mu\text{g}/\text{m}^3$ at AQ-5 to $52.7\mu\text{g}/\text{m}^3$ at AQ-5 with the 98th percentile $51.69\mu\text{g}/\text{m}^3$ at AQ-5. The minimum and maximum level of PM_{10} recorded within the study area was in the range of $26.54\mu\text{g}/\text{m}^3$ at AQ-7 to $75.36\mu\text{g}/\text{m}^3$ at AQ-7 with the 98th percentile $74.57\mu\text{g}/\text{m}^3$ at AQ-7. The minimum and maximum concentration of SO_2 recorded within the study area was in the range of was $2.1\mu\text{g}/\text{m}^3$ at AQ-1 to $13.4\mu\text{g}/\text{m}^3$ at AQ-3 with the 98th percentile $12.12\mu\text{g}/\text{m}^3$ at AQ-8. The minimum and maximum level of NO_2 recorded within the study area was in the range of was $2.5\mu\text{g}/\text{m}^3$ at AQ-8 to $20.7\mu\text{g}/\text{m}^3$ at AQ-2 with the 98th percentile $20.10\mu\text{g}/\text{m}^3$ at AQ-2. The results thus obtained indicate that the concentrations of PM_{10} , $\text{PM}_{2.5}$, SO_2 and NO_2 in the Ambient Air are well within the National Ambient Air Quality (NAAQ) standards for Industrial, Residential, Rural and other areas.

Free SiO_2 (in $\mu\text{g}/\text{m}^3$):

SiO_2	AQ-1	AQ-2	AQ-3	AQ-4	AQ-5
Minimum	1.653	1.538	1.525	1.568	1.756
Maximum	1.891	1.742	1.651	1.758	1.949

The standard for Respirable dust is $3\mu\text{g}/\text{m}^3$ for 8 hour of working period where free silica content should not exceed 5% as prescribed by Directorate General of Mines Safety.

Observations:

The minimum & maximum concentrations of SiO_2 were found to be $1.525\mu\text{g}/\text{m}^3$ at AQ-3 & $1.949\mu\text{g}/\text{m}^3$ at AQ-5 respectively.

3.1.3 WATER ENVIRONMENT

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose. The water quality at project site and other locations within the 10 km impact zone was monitored during October – December 2022.

(a) **Ground Water-** Three water samples were collected from the study area. The locations of the monitoring are given below –

Table 3.2 (iv) Ground water sampling locations

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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Location Code	Sample collected from	Direction	Distance	Project area/Study Area
GW 1	Project Site	E	0.05 km	Study Area
GW 2	Chhana	SW	0.17 km	Study Area
GW 3	Jhakra	E	1.31 km	Study Area

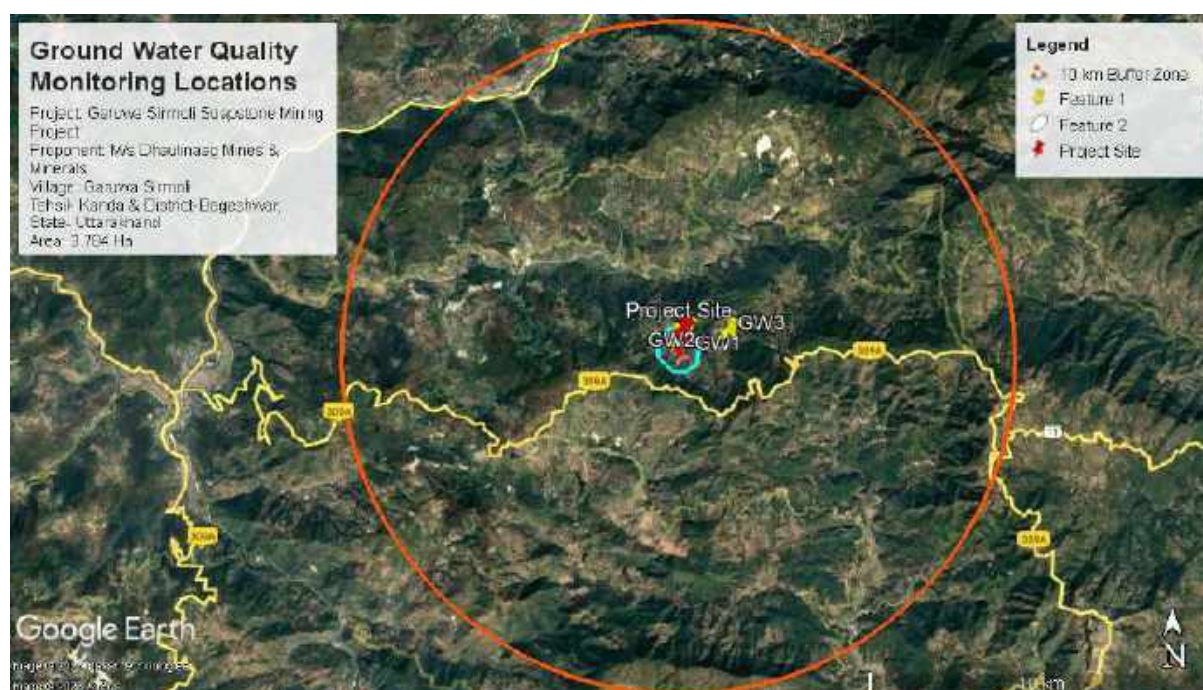


Fig 3.2 (b) Ground Water Quality Monitoring Locations

Table 3.2 (v) Physico-chemical properties of ground water (October, 2022)

S.No	Parameter	Limit (as per IS:10500:2012)		Unit	GW1	GW2	GW3
		Desirable Limit	Permissible Limit				
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.15	7.35	7.42
6	Total Hardness (as CaCO ₃)	200	600	mg/l	152	196	215
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.10	0.13	0.08
8	Chlorides (as Cl)	250	1000	mg/l	110	119	102
9	Fluoride (as F)	1	1.5	mg/l	0.4	0.4	0.5
10	TDS	500	2000	mg/l	365	452	559
11	Calcium(as Ca ²⁺)	75	200	mg/l	36	32	38
12	Magnesium (as Mg ²⁺)	30	100	mg/l	32	34	30

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.05	0.06	0.04
15	Sulphate (as SO ₄)	200	400	mg/l	43	50	39
16	Nitrate(as NO ₃)	45	No Relaxation	mg/l	3.2	3.7	3.5
17	Phenolic Compounds (as C ₆ H ₅ OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.04	0.05	0.03
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr ⁶⁺)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.1	<0.1	<0.1
28	Alkalinity (as CaCO ₃)	200	600	mg/l	102	112	85
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.02	<0.02	<0.02
30	Boron (as B)	0.5	1	mg/l	0.2	0.2	0.1
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/100ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Physico-chemical properties of ground water at village (November, 2022)

S.No.	Parameter	Limit (as per IS:10500:2012)		Unit	GW1	GW2	GW3
		Desirable Limit	Permissible Limit				
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.16	7.30	7.55
6	Total Hardness (as CaCO ₃)	200	600	mg/l	196	205	255
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.12	0.13	0.11
8	Chlorides (as Cl)	250	1000	mg/l	15	19	25
9	Fluoride (as F)	1	1.5	mg/l	0.5	0.7	0.6
10	TDS	500	2000	mg/l	552	498	356



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11	Calcium(as Ca2+)	75	200	mg/l	35	26	29
12	Magnesium (as Mg2+)	30	100	mg/l	31	35	32
13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.05	0.07	0.05
15	Sulphate (as SO4)	200	400	mg/l	12.5	13.2	16
16	Nitrate(as NO3)	45	No Relaxation	mg/l	3.5	4.1	3.2
17	Phenolic Compounds (as C6H5OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.05	0.06	0.04
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.1	<0.1	<0.1
28	Alkalinity (as CaCO3)	200	600	mg/l	95	85	105
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.02	<0.02	<0.02
30	Boron (as B)	0.5	1	mg/l	0.2	0.2	0.1
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/100ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Physico-chemical properties of ground water at (December, 2022)

S.No.	Parameter	Limit (as per IS:10500:2012)		Unit	GW1	GW2	GW3
		Desirable Limit	Permissible Limit				
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.39	7.45	7.70
6	Total Hardness (as CaCO3)	200	600	mg/l	258	245	210
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.14	0.17	0.13

8	Chlorides (as Cl)	250	1000	mg/l	55	62	51
9	Fluoride (as F)	1	1.5	mg/l	0.6	0.7	0.6
10	TDS	500	2000	mg/l	645	596	620
					35	36	25
11	Calcium(as Ca ²⁺)	75	200	mg/l			
12	Magnesium (as Mg ²⁺)	30	100	mg/l	31	39	30
13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.05	0.04	0.04
15	Sulphate (as SO ₄)	200	400	mg/l	12	13	15
16	Nitrate(as NO ₃)	45	No Relaxation	mg/l	3.8	4.3	3.5
17	Phenolic Compounds (as C ₆ H ₅ OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.06	0.07	0.05
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr ⁶⁺)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.1	<0.1	<0.1
28	Alkalinity (as CaCO ₃)	200	600	mg/l	89	106	111
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.02	<0.02	<0.02
30	Boron (as B)	0.5	1	mg/l	0.2	0.1	0.1
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/100ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Observation:

Analysis results of ground water in the study area reveal the following: -

- pH varies from 7.15 to 7.70.
- Total hardness varies from 152 to 258 mg/l.
- Total dissolved solids vary from 356 mg/l to 645 mg/l.

The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by Indian Standards IS: 10500.

Fluorides and nitrates are within the permissible limits. Most of the parameters in ground water sources are well within the permissible limits as per IS: 10500-2012, Drinking Water Standards.

(b) **Surface Water-** The surface water samples have been collected from river which is at a distance of 3-6Km from project site. All sampling locations are marked in Map. The Physico-chemical analysis of the water samples is given below-

Table 3.2 (vi) Surface water sampling locations

Location Code	Sample collected from	Direction	Distance	Project area/Study Area
SW 1	Pungar River	N	1.90 km	Study area
SW 2	Kulur Stream	SE	6.56 km	Study Area

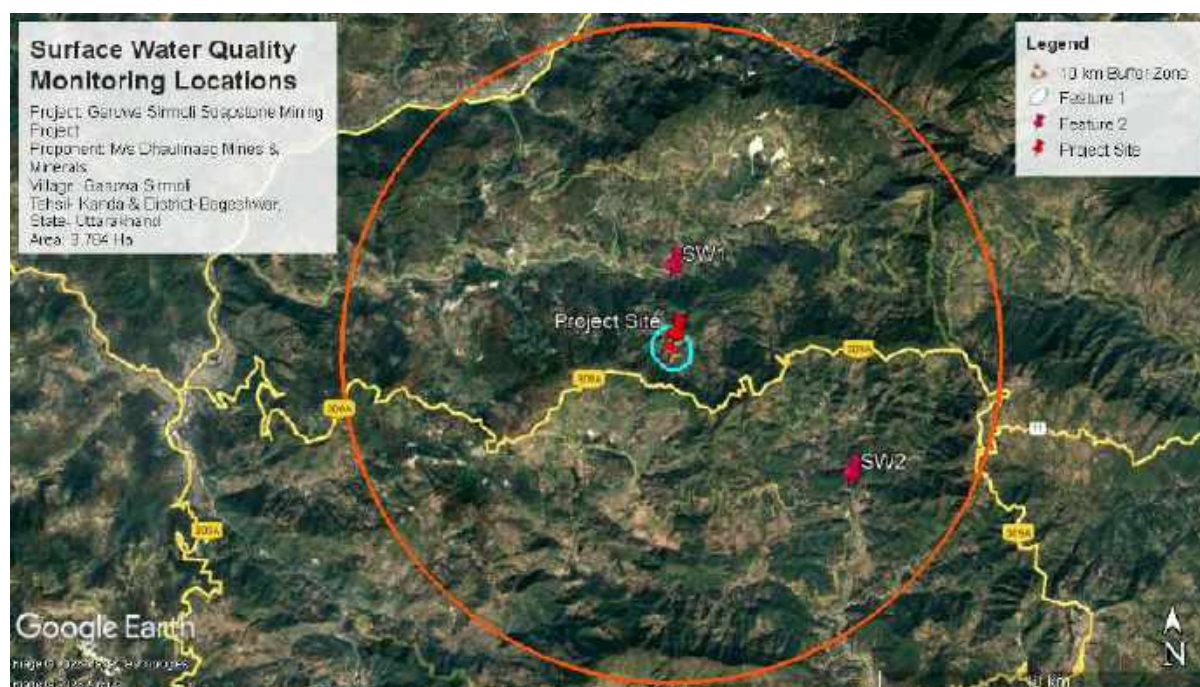


Fig 3.2 (c) Surface Water Quality Monitoring Locations

Table 3.2 (vii) Physico-chemical properties of surface water (October, 2022)

S.No.	Parameter	Unit	S.W. 1	SW 2
			Study area	Study area
1	pH	-	7.55	7.62
2	Dissolved Oxygen	mg/l	5.9	6.2
3	BOD(3Days at 27°C)	mg/l	2.9	3.5
4	Free Ammonia(as N)	mg/l	<0.1	<0.1

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
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5	Sodium Adsorption Ratio	-	0.47	0.60
6	Boron	mg/l	0.2	0.2
7	Conductivity	µmhos/cm	332	345
8	Temperature	(°C)	19.9	20.8
9	Turbidity	NTU	5	5
10	Magnesium Hardness(asCaCO ₃)	mg/l	47	48
11	Total Alkalinity (asCaCO ₃)	mg/l	104	110
12	Chloride (as Cl)	mg/l	23	26
13	Sulphate (as SO ₄)	mg/l	16	15
14	Nitrate(as NO ₃)	mg/l	0.4	0.5
15	Fluoride(as F)	mg/l	0.5	0.6
16	Sodium (as Na)	mg/l	13	15
17	Potassium(as K)	mg/l	2.1	2.2
18	TKN (as N)	mg/l	0.4	0.5
19	Total Phosphorous (as P)	mg/l	0.06	0.07
20	COD	mg/l	10	12
21	Phenolic compounds (asC ₆ H ₅ OH)	mg/l	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.11	0.14
24	Cadmium (as Cd)	mg/l	<0.001	<0.001
25	Zinc (as Zn)	mg/l	0.05	0.06
26	Arsenic (as As)	mg/l	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01
30	TDS	mg/l	229	354
Bacteriological Parameters				
1	Total Coliform	MPN/100ml	515	605
2	Faecal Coliform	MPN/100ml	212	215

Physico-chemical properties of surface water (November, 2022)

S.No.	Parameter	Unit	S.W. 1	SW 2
			Study area	Study area
1	pH	-	7.45	7.69
2	Dissolved Oxygen	mg/l	5.8	6.4
3	BOD(3Daysat27°C)	mg/l	2.7	4.2
4	Free Ammonia(as N)	mg/l	<0.1	<0.1



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5	Sodium Adsorption Ratio	-	0.48	0.54
6	Boron	mg/l	0.2	0.2
7	Conductivity	µmhos/cm	349	380
8	Temperature	(°C)	12.6	15.7
9	Turbidity	NTU	4	5
10	Magnesium Hardness(asCaCO3)	mg/l	49	52
11	Total Alkalinity (asCaCO3)	mg/l	108	114
12	Chloride (as Cl)	mg/l	29	36
13	Sulphate (as SO ₄)	mg/l	12	10
14	Nitrate(as NO ₃)	mg/l	0.5	0.7
15	Fluoride(as F)	mg/l	0.5	0.6
16	Sodium (as Na)	mg/l	13	17
17	Potassium(as K)	mg/l	2.3	2.5
18	TKN (as N)	mg/l	0.5	0.6
19	Total Phosphorous (as P)	mg/l	0.06	0.07
20	COD	mg/l	14	15
21	Phenolic compounds (asC ₆ H ₅ OH)	mg/l	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.12	0.15
24	Cadmium (as Cd)	mg/l	<0.001	<0.001
25	Zinc (as Zn)	mg/l	0.06	0.07
26	Arsenic (as As)	mg/l	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01
30	TDS	mg/l	345	417
Bacteriological Parameters				
1	Total Coliform	MPN/100ml	623	740
2	Faecal Coliform	MPN/100ml	240	248

Physico-chemical properties of surface water (December, 2022)

S.No.	Parameter	Unit	S.W. 1	SW 2
			Study area	Study area
1	pH	-	7.71	7.80
2	Dissolved Oxygen	mg/l	6.0	5.9
3	BOD(3Daysat27°C)	mg/l	2.8	3.1
4	Free Ammonia(as N)	mg/l	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.76	0.83
6	Boron	mg/l	0.2	0.3
7	Conductivity	µmhos/cm	420	440

8	Temperature	(°C)	13.7	16.5
9	Turbidity	NTU	7	7
10	Magnesium Hardness(asCaCO ₃)	mg/l	51	57
11	Total Alkalinity (asCaCO ₃)	mg/l	112	106
12	Chloride (as Cl)	mg/l	32	40
13	Sulphate (as SO ₄)	mg/l	18	16
14	Nitrate(as NO ₃)	mg/l	0.6	0.8
15	Fluoride(as F)	mg/l	0.5	0.6
16	Sodium (as Na)	mg/l	21	23
17	Potassium(as K)	mg/l	2.5	2.8
18	TKN (as N)	mg/l	0.7	0.8
19	Total Phosphorous (as P)	mg/l	0.07	0.08
20	COD	mg/l	13	15
21	Phenolic compounds (asC ₆ H ₅ OH)	mg/l	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.15	0.16
24	Cadmium (as Cd)	mg/l	<0.001	<0.001
25	Zinc (as Zn)	mg/l	0.07	0.08
26	Arsenic (as As)	mg/l	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01
30	TDS	mg/l	352	370
Bacteriological Parameters				
1	Total Coliform	MPN/100ml	620	750
2	Faecal Coliform	MPN/100ml	300	350

Observation:

- The analysis results indicate that the pH ranges between 7.45 and 7.80.
- Dissolved Oxygen (DO) was observed in the range of 5.8 to 6.4 mg/l against the minimum requirement of 4 mg/l.
- BOD values were observed to be in the range of 2.7-4.2 mg/l.
- Bacteriological examination of surface water samples revealed the presence of total coliform in range of 515 MPN/100 ml to 750 MPN/100 ml against the limit of 5000 MPN/100 ml.

Based on the results it is evident that most of the parameters of the samples comply with 'Category C' standards of CPCB, indicating their suitability for drinking water source with conventional treatment followed by disinfection.

3.1.4 SOIL ENVIRONMENT

Majority of soil type in Bageshwar district is sandy loam which covers around 84% of total geographical area. The alluvium in area comprises of silt, sand, gravel, clay and kankar. Soil may be defined as a thin layer of earth's crust, a medium for the growth of plants. The soil characteristics include both physical and chemical properties. The soil survey and soil sample were carried out / collected to assess the soil characteristics of the study area. Soil samples were collected from 3 locations & analyzed as per CPCB norms. The soil sampling locations are marked in Map. The physico-chemical characteristic of these soil samples is given in Table No. 3.2 (ix).

Table No. 3.2 (viii) Description of soil sampling locations

Location Code	Location	Direction	Distance	Project area/Study Area
SQ1	Project Site	E	0.05 km	Project Area
SQ2	Chhana	SW	0.17 km	Study Area
SQ3	Jhakra	E	1.31 km	Study Area

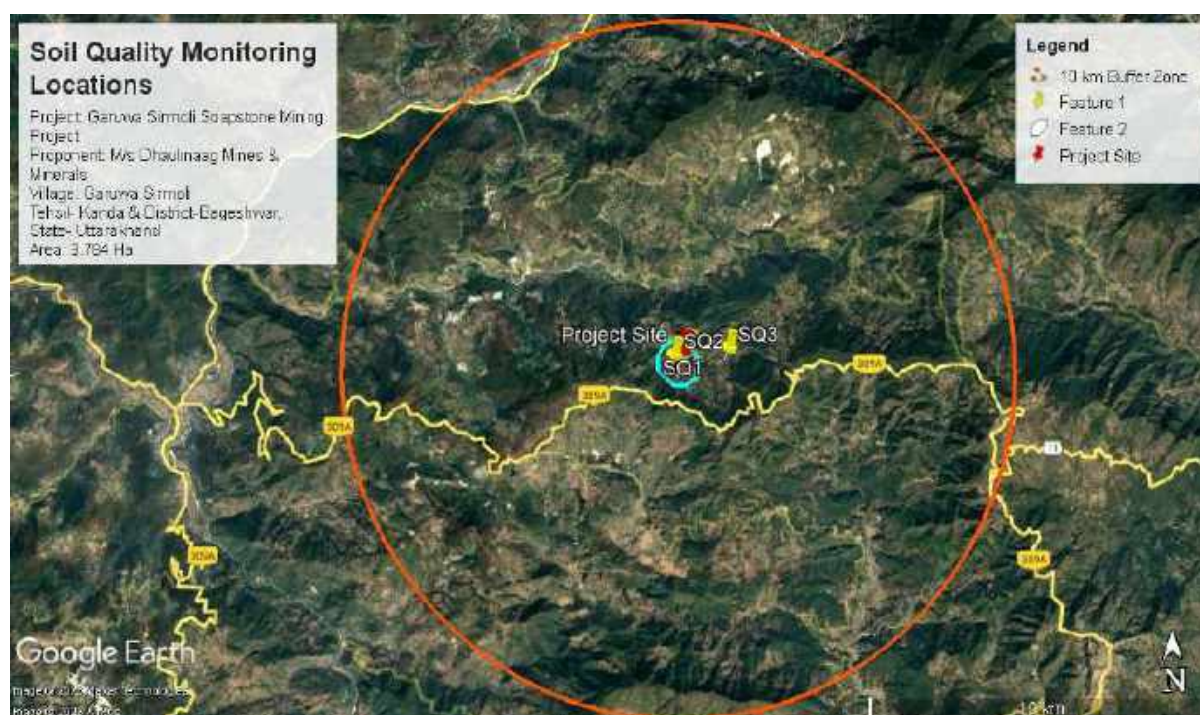


Figure- 3.2(d) Soil quality monitoring location

Table 3.2 (ix) Physico-chemical properties of soil

S.No	Parameter	Unit	SQ-1	SQ-2	SQ-3
1	Texture	-	Sandy loam	Sandy Clay Loam	Sandy loam
	Sand	%	51.2	54.8	58.8
	Silt	%	22.5	23.8	21.2
	Clay	%	21.2	20.4	29.0
2	pH	-	7.61	7.52	7.75
3	Electrical Conductivity	µmhos/cm	362	485	495
4	Cation exchange capacity	meq/100 gm	14.34	13.28	12.52
5	Exchangeable Potassium	meq/100 gm	0.28	0.21	0.24
6	Exchangeable Sodium	meq/100 gm	0.59	0.51	0.48
7	Exchangeable Calcium	meq/100 gm	9.25	9.34	9.76
8	Exchangeable Magnesium	meq/100 gm	3.69	3.28	2.95
9	Sodium Absorption Ratio	-	0.71	0.65	0.62
10	Water Holding Capacity	%	26.9	26.5	24.2
11	Porosity	%	35.2	36.7	37.2
12	Permeability	cm/hrs	1.8	1.9	2.0
13	Total kjehdahl Nitrogen	%	0.049	0.039	0.034
14	Phosphorus(Olsen's)	mg/kg	8.7	7.2	6.8
15	Organic Matter	%	0.35	0.32	0.33
16	Bulk Density	gm/cc	1.34	1.37	1.38

Observations- 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. In the study area, variations in the pH of the soil were found to be slightly basic (7.52 to 7.75). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 362-495 µmhos/cm. Potassium is found to be from 0.21meq/100 gm to 0.28meq/100 gm. The water holding capacity is found in between 24.2% to 26.9 %. The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops.

3.1.5 NOISE ENVIRONMENT

Noise is one of the most undesirable and unwanted by-products of our modern life style. It may not seem as insidious or harmful as air and water pollutants but it affects human health and well-being and can contribute to deterioration of human well-being in general and 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 site. 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. The levels recorded are as stated in Table 3.2 (xi)

Table 3.2 (x): Noise quality monitoring stations

Location Code	Location	Direction	Distance	Project area/Study Area
NQ1	Project Site	E	0.05 km	Project Area
NQ2	Garuwa Sirmoli	NNE	0.16 km	Study Area
NQ3	Adhyali	SE	0.30 km	Study Area
NQ4	Chhana	SW	0.17 km	Study Area

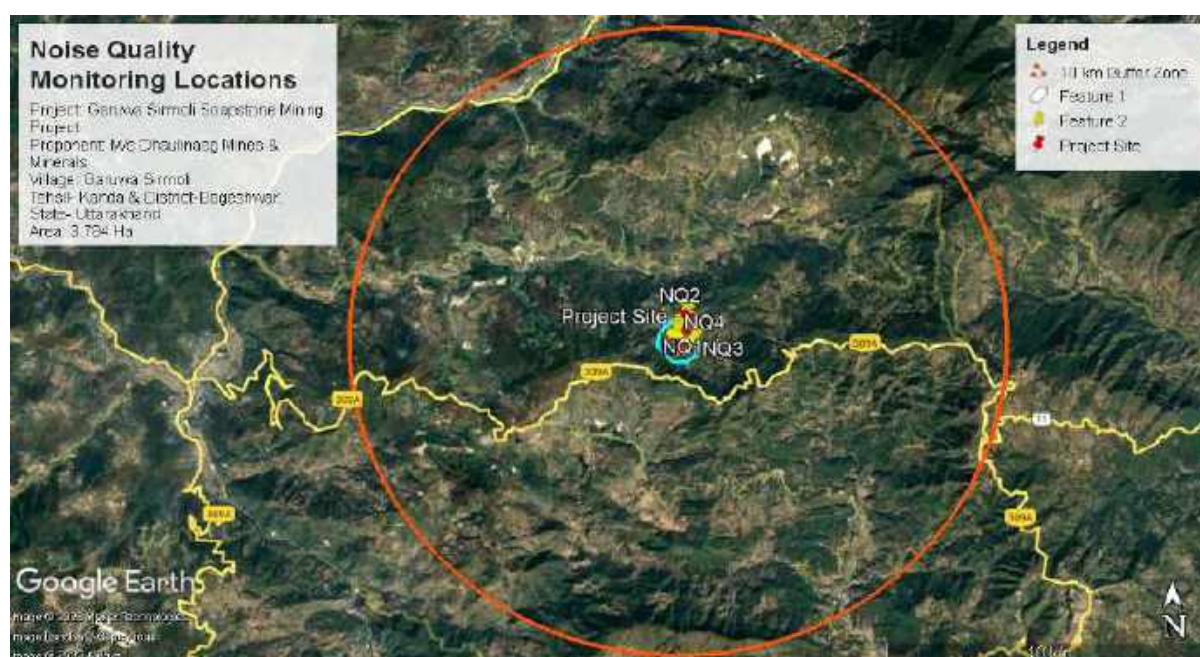


Figure – 3.2(e) Noise quality monitoring location

Table No. 3.2 (xi): Noise level status

Noise Quality data October – December 2022						
S.No.	Locations	ZONE	LIMIT (as per CPCB Guidelines), Leq		RESULT (Leq)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	NQ1	Project Site	75	70	54.8	42.4
2	NQ2	Residential Zone	55	45	53.2	40.2
3	NQ3	Residential Zone	55	45	47.3	38.8
4	NQ-4	Residential zone	55	45	50.3	43.9
* Day Time		Leq in dB(A) (6.00AM TO 10.00PM)				
* Night Time		Leq in dB(A) (10.00PM TO 6.00AM)				

Observation –

Noise monitoring reveals that the maximum & minimum noise levels at day time were recorded as 54.8 dB (A) at NQ-1 & 47.3 dB (A) at NQ-3 respectively. The maximum & minimum noise levels at night time were found to be 43.9dB (A) at NQ-4 & 38.8 dB (A) at NQ-3 respectively.

There are several sources in the 10 km radius of study area, which contributes to the local noise level of the area. On the commencement of the project, the sound from traffic activities will add to the ambient noise level of the area. This will be kept under check by taking proper suggestive measures.

3.2 BIOLOGICAL ENVIRONMENT

Biological components are one of the most important constituent of our environment. They are the integral part of our life as they provides the food, fodder and medicine, but also contributes in improvement of essential environmental attributes like air, water, soil, etc. Their conservation and sustainable use is very much essential in today's developmental process. Developmental processes are today's demand and cannot be stopped as such. It has been observed in past that most of our developmental process cost our environment. In order to keep them unaffected or minimum affected while our developmental activity, it is always necessary to know the background of the area from biological point of view. Biological

diversity comprises the variability of species, genus and ecosystems and is very crucial for maintaining the basic processes on which the life depends. Broadly, it can be divided into two types i.e. the floral diversity and faunal diversity. After getting such information we can estimate the impact on the environment by the proposed activities and mitigate them. Similar approach has been adopted for conducting the Biological Environment study for the proposed Project.

ECOSYSTEM ANALYSIS & AREA OF ECOLOGICAL IMPORTANCE WITHIN THE STUDY AREA

The study area comprises of terraced agricultural field showing undulating topography. The highest & lowest levels found in the area are of 1492.45 mRL to 1401.85 mRL respectively. The slopes in hill area vary from moderate to gentle. The drainage pattern of the area is dendrites in pattern & in first & second order. The area is infertile in nature.

Drainage of the district area is mainly controlled by Saryu, Gomti and Pindar Rivers and their tributaries (locally called *Nadi*, *Gad* or *Gadhera*) viz. Pungar *Nadi*, Khir Ganga *Nadi*, Bhadrapati *Nadi*, Revti Ganga etc. The Central and North-Central parts of the district are drained by Saryu River. These rivers are primarily fed by snowmelt with relatively smaller contribution from ground water. Saryu River and Pungar River falls within 10 km study area from our project boundary.

January is the coldest month with mean temperature of 2-10°C. Temperature drops down to – 6°C during January and February in the northern part of the district. June is the warmest month with the mean temperature between 15-25°C. The Relative Humidity increases rapidly with the onset of monsoon and reaches at about 80% during July to September. The driest part of the year is the pre-monsoon period, when the humidity is as low as 30% in the afternoons. Skies are heavily clouded during the monsoon months and for short spells when the district is affected by Western Disturbances. Two broad wind patterns are observed in the district viz. north easterly to easterly (May to September) and south easterly to westerly (October to March).

a) Forests cover and Forest Type

The forest of the district includes the vast range found in the Himalayas, varying from the sub-tropical species which grow in the outer ranges of low hills to the rich Alpine flowers in the north. The forest cover in the Uttarakhand state has a total geographical area of 53,483 km², of which large area is mountainous with under snow cover and steep slopes. According

to forest survey of India (FSI-2015), very dense forest is 4,785 km², moderately dense forest is 14,111 km², open forest is 5,612 km² and Scrub is 262 km². Bageshwar district and its forest region is mainly flourished with, Tropical dry deciduous forest and Tropical moist deciduous forests (According to Champion and Seth, classification 1968). This type of forest occurs in the dry southern face of shiwaliks, adjoining plain area and in the region of lower Himalayas, tarai area. It is open and mixed type forest.

b) Agriculture

Agriculture is the main occupation of the people. However, intensive cultivation is not possible as major part of the district is mountainous. Agricultural activities are common on gentle hill slopes and in relatively plain, broad river valley of Saryu and Pungar in District. Rice, wheat, mandua, barley, maize and sawan are the principal crops grown in the district. Area supports moderately healthy vegetation, the main forest species are scattered all over the hills, riparian vegetation found along the Saryu River and upper reaches of hills covered with pine forest.

c) Nearest Protected Area

The area is rich in ecology and apt for places of ecological research studies. Protected areas such as Binsar WLS or Musk Deer Research Center, are at a distance of more than 20 km away from the study area. The study area is replenished with several reserve forests within its 10 km region. The list of the following reserve forests is given below:

- Huram Reserve Forest, 2.94 km in SE direction
- Chaukori Berinag Reserve Forest, 5.82 km in ESE direction
- Manjgaon Reserve Forest, 2.37 km in NW direction
- Bhandola Reserve Forest, 1.91 km in NNE direction
- Letala Reserve Forest, 7.50 km in N direction
- Pokhdanda Reserve Forest, 8.11 km in NNW direction
- Baisbunga Reserve Forest, 7.79 km in NW direction
- Pungar Reserve Forest, 8.42 km in NW direction
- Phalyanti Reserve Forest, 8.84 km in W
- Gairar Reserve Forest, 5.21 km in W direction
- Chhatena Reserve Forest, 9.10 km in WSW direction
- Gurna Reserve Forest, 6.67 km in SW direction

- Bankot Reserve Forest, 9.42 km in SSW direction
- Ratmoli Reserve Forest, 8.63 km in S direction

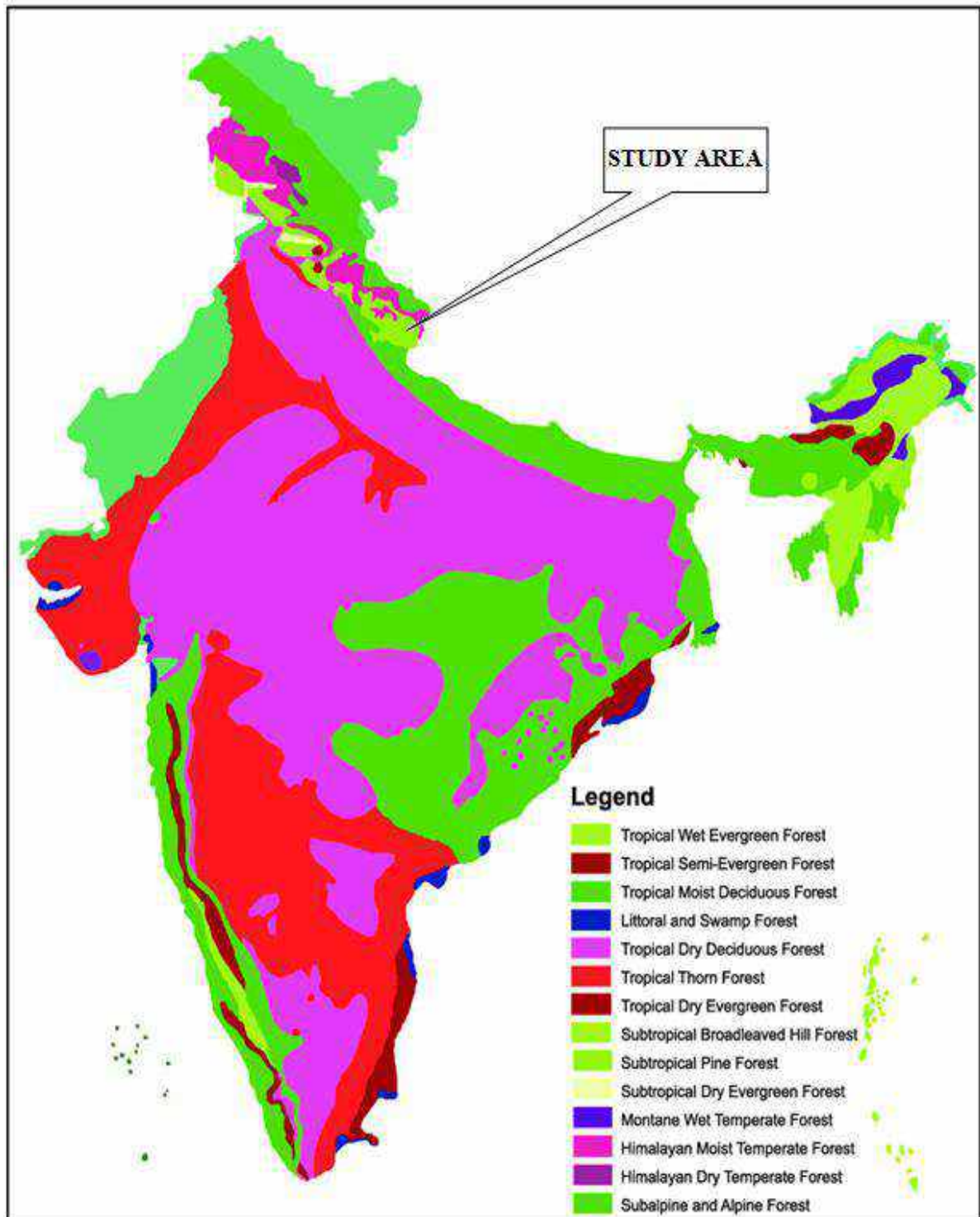


Fig 3.3(i): The study area falls in Tropical Dry Deciduous Forest

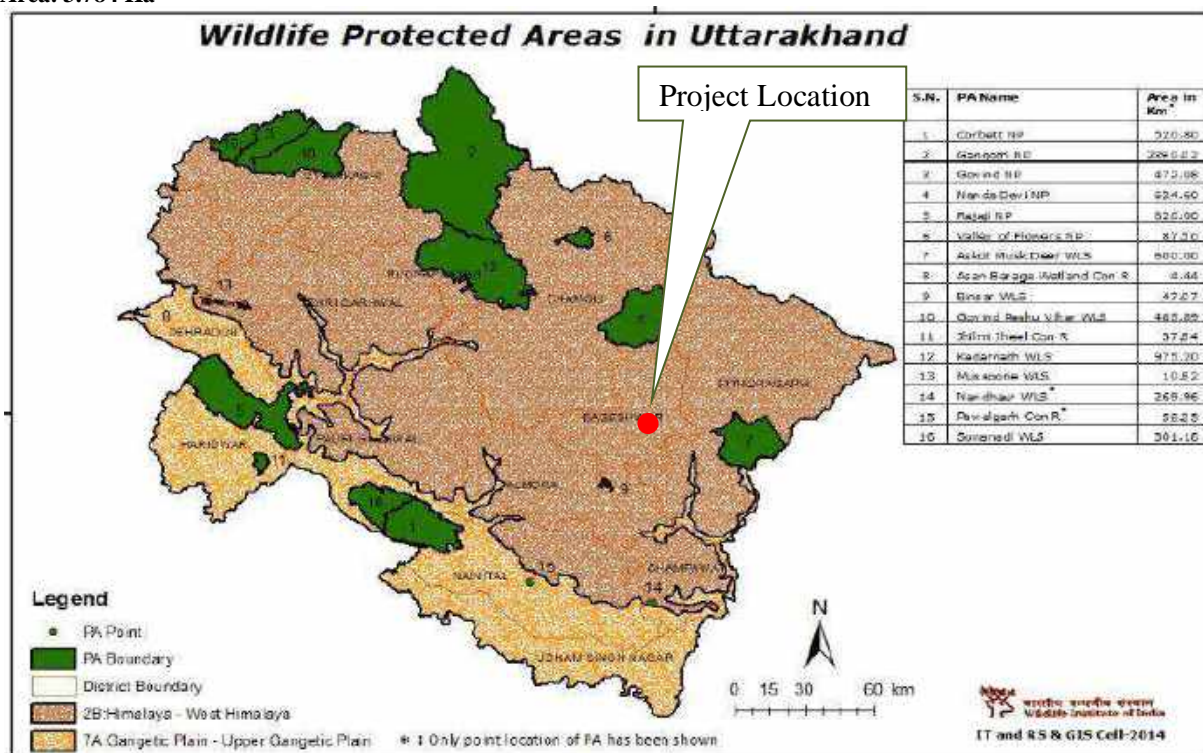


Fig: Project Location shown on Map of Protected Areas of Uttarakhand

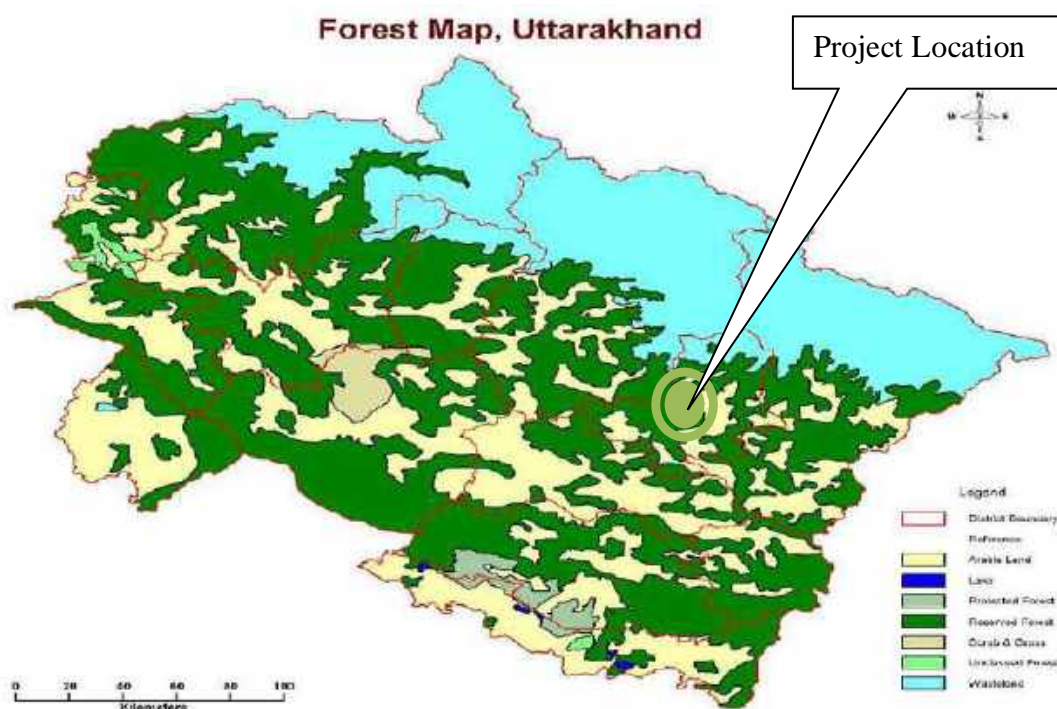


Fig: Project Location Shown on Forest Map of Uttarakhand

Methodology for Floral & Faunal Study

During the study, the floral composition of the area was evaluated through secondary study and primary study. Survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit. Secondary data was collected from published literature.

The details are given as below:

Survey sites : In and around the project site (10 km radius)
Core zone : At the project site and within 500 m radius from the project site
Buffer zone : 10 km radius surrounding the project site
Study Period : October, 2022

Table 3.1: Mode of data collection & parameters considered during the survey

Aspect	Data	Mode of data collection	Parameters monitored
Terrestrial Ecology	Primary data Collection	Field survey, Core Zone – Transect Method Buffer zone- Interviews from Local People/authorities	Floral
	Secondary data collection	From authentic sources like Forest Department of Uttarakhand, Government websites and available published literatures or maps	Floral and Faunal diversity and study of Vegetation, forest type, importance etc.
River Ecology	Secondary data collection	From Government sites and published literatures	Fish fauna

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literatures to get the

correct picture of the study area. Inventory of flora and fauna is prepared on the basis of collected data. Forest type and vegetation of the study area is discussed on the basis of plant species recorded from the area.

Flora of the Core zone

The core zone comprises of private agriculture land, where mining operation is proposed. Few invasive species like *Partheniumhysterosporus*, *lantanacamara*, shrubs like *Cannabissativa* etc. are present. No ecologically sensitive plant species has been reported from core area.

Flora of the Buffer zone: Buffer zone of the proposed project falls in lesser and Greater Himalaya region. Buffer zone consists of many reserve forests enlisted above, a variety of faunal species are found in the region. Many tree species are planted in the area because of their usefulness, economic and aesthetic values. The tree species observed in the area are, Aam (*Mangifera indica*), Jamun (*Syzygiumcumini*), Bail (*Aeglemarmelos*), Dakain (*Meliaazedarach*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*), Bhimal (*Grewiaoptiva*) etc.

In agricultural waste land and along the road side, growth of shrubs (including invasive species) like *Argemonemexicana*, *Cannabis sativa*, *Cenchrusciliaris*, *Partheniumhysterosporus*, etc. are very common. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Vegetation in and around human settlement:

Vegetation pattern in villages and surrounding areas are slightly different and lesser from the rest of the regions of Bageshwar district. The common species grown near villages are mostly edible or useful plants such as *Mangifera indica*, *Azadirachta indica*, *Albizialebbeck*, *Delonix regia*, *Ficus religiosa*, etc.

Table 3.16 (i): Flora of the Core Zone

S.No.	Local Name	Botanical Name	Family
Herb			
1	Kanta Chaulai	<i>Amaranthus spinosus</i>	<i>Amaranthaceae</i>
2	Arbi	<i>Colocasia esculenta</i>	<i>Araceae</i>
3	Doob, dobri	<i>Cynodon dactylon</i>	<i>Poaceae</i>
4	Kaans	<i>Saccharum spontaneum</i>	<i>Poaceae</i>
5	Goat weed, ghabuti	<i>Ageratum conyzoides L.</i>	<i>Asteraceae</i>
6	Bathuwa	<i>Chenopodium album L.</i>	<i>Chenopodiaceae</i>
7	Ban kakari	<i>Podophyllum hexandrum</i>	<i>Podophyllaceae</i>
8	Lajvanti	<i>Mimosa pudica</i>	<i>Mimosaceae</i>
9	Bajardanti	<i>Potentilla fulgens</i>	<i>Rosaceae</i>
10	Jangli Jira	<i>Carum carvi L.</i>	<i>Apiaceae</i>
11	Kantachaulai	<i>Amaranthus spinosus L.</i>	<i>Amaranthaceae</i>
12	Kalihari	<i>Gloriosa superba L.</i>	<i>Liliaceae</i>
13	Jambu	<i>Allium stracheyi</i>	<i>Liliaceae</i>
14	Rsabhak	<i>Malaxis muscifera</i>	<i>Orchidaceae</i>
15	Atis	<i>Aconitum heterophyllum</i>	<i>Ranunculaceae</i>
16	Angeli	<i>Anemone rivularis</i>	<i>Ranunculaceae</i>
17	Bhang, hemp	<i>Cannabis sativa L.</i>	<i>Canabaceae</i>
Shrub			

18	Aak	<i>Calotropisprocera</i>	<i>Asclepiadaceae</i>
19	Kasunda	<i>Cassia occidentalis</i>	<i>Fabaceae</i>
20	Kanghi	<i>Abutilon indicum</i>	<i>Malvaceae</i>
21	Ber	<i>Ziziphusmauritiana</i>	<i>Rhamnaceae</i>
22	Dhatura	<i>Daturainnoxia</i>	<i>Solanaceae</i>
23	Raimuniya	<i>Lantana camara</i>	<i>Verbenaceae</i>
24	Tivra Gandha	<i>Chromoleanaodorata (L.)</i>	<i>Asteraceae</i>
25	Kilmora	<i>Berberisaristata</i>	<i>Berberidaceae</i>
26	Jhinti	<i>Barleriacristala</i>	<i>Acanthaceae</i>
Climber			
27	Giloe	<i>Tinosporasinensis</i>	<i>Menispermaceae</i>
28	Majethi	<i>Rubiaccordifolia L.</i>	<i>Rubiaceae</i>
29	Ganjaroo	<i>Stephania glabra M.</i>	<i>Menispermaceae</i>
Trees			
30	Sawani, farash	<i>Lagerstroemia indica</i>	<i>Lythraceae</i>
31	Semal	<i>Bombax ceiba L.</i>	<i>Bombacaceae</i>
32	Siris	<i>Albizzia chinensis</i>	<i>Mimosaceae</i>

Table 3.16 (ii): Flora of the Buffer zone

S. No.	Local Name	Botanical Name	Family
Herbs			

1	Garundi	<i>Alternanthera paronychioides</i>	<i>Amaranthaceae</i>
2	Kantachaulai	<i>Amaranthus spinosus</i>	<i>Amaranthaceae</i>
3	Arbi	<i>Colocasia esculenta</i>	<i>Araceae</i>
4	Goat weed, ghabuti	<i>Ageratum conyzoides</i>	<i>Asteraceae</i>
5	Madras carpet	<i>Grangea maderaspatana</i>	<i>Asteraceae</i>
6	Wild carrot, gajarghas	<i>Parthenium hysterophorus</i>	<i>Asteraceae</i>
7	Chakunda	<i>Cassia tora</i>	<i>Fabaceae</i>
8	Bhang , hemp	<i>Cannabis sativa</i>	<i>Cannabaceae</i>
9	Bathuwa	<i>Chenopodium album</i>	<i>Chenopodiaceae</i>
10	Mexican poppy	<i>Argemone Mexicana</i>	<i>Papaveraceae</i>
11	Doob, dobri	<i>Cynodon dactylon</i>	<i>Poaceae</i>
12	Malankuri, wiregrass	<i>Eleusine indica</i>	<i>Poaceae</i>
13	Bharbhusi	<i>Eragrostis tenella</i>	<i>Poaceae</i>
14	Kaans	<i>Saccharum spontaneum</i>	<i>Poaceae</i>
15	Podina	<i>Mentha arevensis L.</i>	<i>Lamiaceae</i>
16	Amla	<i>Emblica officinalis</i>	<i>Euphorbiaceae</i>
17	Chirpati, rasbhari	<i>Physalis minima</i>	<i>Solanaceae</i>
18	Fern	<i>Adiantum sps.</i>	<i>Adiantaceae</i>
19	Ladder fern	<i>Pteris sps.</i>	<i>Pteridaceae</i>
20	Bazeer	<i>Pimpinella diversifolia DC.</i>	<i>Apiaceae</i>

Shrubs			
21	Aak	<i>Calotropisprocera</i>	<i>Asclepiadaceae</i>
22	Kasunda,chakunda	<i>Cassia occidentalis</i>	<i>Fabaceae</i>
23	Ban tulsi	<i>Croton bonplandianum</i>	<i>Euphorbiaceae</i>
24	Kanghi,atibala	<i>Abutilon indicum</i>	<i>Malvaceae</i>
25	Booganbel	<i>Bougainvillea spectabilis</i>	<i>Nyctaginaceae</i>
26	Ber	<i>Ziziphusmauritiana</i>	<i>Rhamnaceae</i>
27	Datura	<i>Daturainnoxia</i>	<i>Solanaceae</i>
28	Kateli	<i>Solanumvirginianum</i>	<i>Solanaceae</i>
29	Raimuniya	<i>Lantana camara</i>	<i>Verbenaceae</i>
30	Barbeery,rasaut	<i>Berberis vulgaris</i>	<i>Berberidaceae</i>
31	Curry leaf	<i>Murrayakoenigii</i>	<i>Rutaceae</i>
32	Timur	<i>Zanthoxylumarmatum</i>	<i>Rutaceae</i>
33	Bichhughas	<i>Urticadioca L.</i>	<i>Urticaceae</i>
34	Rambans	<i>Agave Americana L.</i>	<i>Agavaceae</i>
Climbers			
35	Aakashi-bel	<i>Cuscuta reflexa Roxb.</i>	<i>Cuscutaceae</i>
36	Dudhi-bel	<i>Cryptolepis buchanani</i>	<i>Asclepiadaceae</i>
37	Gethi	<i>Dioscorea bulbifera L.</i>	<i>Dioscoreaceae</i>
38	Tarur	<i>Dioscorea deltoidea</i>	<i>Dioscoreaceae</i>
Trees			

39	Ratanjot	<i>Jatropha curcas</i>	<i>Euphorbiaceae</i>
40	Aam	<i>Mangifera indica</i>	<i>Anacardiaceae</i>
41	Sawani , farash	<i>Lagerstroemia indica</i>	<i>Lythraceae</i>
42	Moral	<i>Ulmus wallichiana</i>	<i>Ulmaceae</i>
43	Bay leaf ,Tejpatta	<i>Cinnamomum tamala</i>	<i>Lauraceae</i>
44	Walnut, Akhrot	<i>Juglans regia</i>	<i>Judlandaceae</i>
45	Himalayan maple	<i>Acer oblongum</i>	<i>Sapindaceae</i>
46	Peepal	<i>Ficus religiosa</i>	<i>Moraceae</i>
47	Goolar	<i>Ficus racemosa</i>	<i>Moraceae</i>
48	Amaltas	<i>Cassia fistula</i>	<i>Fabaceae</i>
49	Arandi	<i>Ricinus communis</i>	<i>Euphorbiaceae</i>
50	Saras	<i>Albizia lebbek</i>	<i>Fabaceae</i>
51	White kachnar	<i>Bauhinia acuminata</i>	<i>Fabaceae</i>
52	Banjh	<i>Quercus leucotricophora</i>	<i>Lauraceae</i>
53	Bakain	<i>Melia azadirach</i>	<i>Meliaceae</i>
54	White babool	<i>Leucaena leucocephala</i>	<i>Fabaceae</i>
55	Kachnar	<i>Bauhinia variegata</i>	<i>Fabaceae</i>
56	Baheda	<i>Terminalia bellerica</i>	<i>Combretaceae</i>
57	Harad	<i>Terminalia chebula</i>	<i>Combretaceae</i>
58	Gulmohar	<i>Delonix regia</i>	<i>Fabaceae</i>
59	Chir, pine	<i>Pinus roxburghii</i>	<i>Pinaceae</i>

60	Khirk	<i>Celtisaustralis</i>	<i>Cannabaceae</i>
61	Bihul, bhimal	<i>Grewiaoptiva</i>	<i>Tiliaceae</i>
62	Chilbil, papri	<i>Holopteleaintegrifolia</i>	<i>Ulmaceae</i>
63	Semal	<i>Bombaxceiba L.</i>	<i>Bombacaceae</i>
64	Jamun	<i>Syzygiumcumini L.</i>	<i>Mytaceae</i>
65	Kaphal	<i>Myricaesculenta</i>	<i>Myricaceae</i>
66	Bhojpatra	<i>Betulautilis D.</i>	<i>Betulaceae</i>
67	Thuner	<i>Taxusbaccata L.</i>	<i>Taxaceae</i>
68	Deodar	<i>Cedrusdeodara</i>	<i>Pinaceae</i>

Fauna of the study area.

Pungar River flows near to the project site, river supports many aquatic wildlife including fish species. Saryu River is approx 9 km away from the project site in N direction.

As far as the reptile community was concerned, Indian cobra, garden gecko and house lizard are recorded from the study area. A list of wild fauna of the study area has been prepared on the basis of local inquiry from the village people and from the available published literatures. The species with conservation status as per Wildlife Protection Act, 1972 are identified. Moreover, global conservation status of species was estimated from Red data book of IUCN.

Mammals: Rodents like Indian palm squirrel (*Funambuluspalmarum*) and field mouse (*Apodemussylvaticus*) are noticed in vicinity of village. Inquiry from village people regarding wild animals reveals that Rhesus macaque (*Macacamulatta*), Indian hare (*Lepusnigricollis*), fruits bat (*Pteropusconspicillatus*), Goral (*Naemoredus goral*) Yellow throated marten (*Martesflavigula*) are often seen in the area. Many domesticated mammal species are reported from buffer zone during the field survey. Common grazing animals like cow and goat, can be noticed in open grass fields.

Avifauna: House crow (*Corvus splendens*), Common Myna (*Acridothera tristis*), Red-rumped Swallow (*Cecropis daurica*), Hoopoe (*Upupa epops ceylonensis*) Warblers and Tits are of common occurrence.

Reptiles: The reptilians species commonly reported are Agama (*Laudakia tuberculata*) in settlement area, Garden lizard (*Calotes versicolor*) and *Eutropis macularia* along shady places in agricultural field or where growth of bushes is noticed.

Amphibian: Amphibians are commonly found at the places along the margin of aquatic and terrestrial systems. Due to presence of water bodies like river, nalas, etc. the study area is providing shelter to many amphibian species. Some of the commonly reported species are *Bufo melanostictus* (common Indian toad), *Euphlyctis cyanophlyctis* (Indian skipper frog,) etc.

Table 3.16 (iii): Fauna of The Core Zone

S. No.	Common Name	Scientific Name	IWPA	IUCN
AVIFAUNA				
1	Common Myna	<i>Acridothera tristis</i>	IV	LC
2	House Crow	<i>Corvus splendens</i>	V	LC
3	Ashy Drongo	<i>Dicrurus leucophaeus</i>	IV	LC
4	Koel	<i>Eudynamis scolopacea</i>	IV	NA
5	Sparrow	<i>Passer domesticus</i>	IV	LC
6	Yellow Bellied Blue Magpie	<i>Urocissa flavirostris</i>	IV	LC
7	Crow	Striped Blue Euploea mulciber		
MAMMALS				
8	Squirrel	<i>Funambulus pennant</i>	IV	DD
9	Rat	<i>Rattus rattus</i>	V	LC
10	Indian Bush Rat	<i>Golunda ellioti</i>	IV	-
11	Indian hare	<i>Lepus nigricollis</i>	IV	-
12	Wild Pig	<i>Sus scrofa</i>	III	-

13	Indian False Vampire	<i>Megaderma lyra E.Geoffroy</i>	IV	-
14	Great Yellow Bat	<i>Scotophilus kuhlii leach</i>	IV	-
15	Hanuman Langur	<i>Semnopithecus entellus</i>	IV	-
Fauna of the Buffer Zone				
S.No.	Common Name	Scientific name	IWPA	IUCN
MAMMALS				
1	Squirrel	<i>Funambulus pennant</i>	IV	DD
2	Rat	<i>Rattusrattus</i>	V	LC
3	Wild pig	<i>Susscrofa</i>	III	LC
4	Yellow throated marten	<i>Martesflavigula</i>	III	LC
5	Monkey	<i>Macacumulata</i>	II	LC
6	Fruit bat	<i>Rousettusleshenaulti</i>	IV	LC
7	Common languor	<i>Presbytis entellus</i>	II	LC
8	Indian Porcupine	<i>Hystrixindica</i>	IV	LC
9	Barking deer (kakar)	<i>Muntiacusmuntjac</i>	III	---
10	Golden Jackal	<i>Canisaureus</i>	II	LC
11	Indian Leopard	<i>Panthera pardus</i>	I	NT
12	Asiatic black bear	<i>Ursus thibetanus</i>	I	VU
13	Leopard Cat	<i>Prionailurus bengalensis</i>		
14	Small Indian Mongoose	<i>Herpestes javanicus</i>		
15	Sloth Bear	<i>Melursus ursinus</i>	IV	
16	Red Fox	<i>Vulpes vulpes</i>	II	-
17	Common Palm Civet	<i>Paradoxurus Hermaphroditus</i>	II	
18	Wild Boar	<i>Susscrofa Linnaeus</i>		
REPTILES & AMPHIBIANS				
20	Common Toad	<i>Duttaphrynusmelanostictus</i>	IV	NA
21	India bull frog	<i>Ranatigrina</i>	IV	DD
22	Indian tree frog	<i>Polypedatesmaculatus</i>	IV	NA

23	Skipping frog	<i>Bufo stomaticus</i>	IV	NA
24	Garden lizard	<i>Calotes versicolor</i>	-	NA
25	House lizard	<i>Hemidactylus sp.</i>	IV	NA
FISHES				
26	Unera	<i>Labeodero</i>	---	NA
27	Kali Rohu	<i>Labeo dyocheilus</i>	---	LC
28	Gadara	<i>Nemacheilus rupicola</i>	---	NA
29	Dhaur , Hill Trout	<i>Barilius bendelisis</i>	---	LC
30	Bhagnera	<i>Garralamta</i>	---	LC
31	Gotyla	<i>Garragotyla</i>	---	LC
32	Pathar-chatti	<i>Glyptothorax pectinopterus</i>	---	LC
AVIFAUNA				
33	Jungle Myna	<i>Acridotheres fuscus</i>	IV	LC
34	Common Myna	<i>Acridotheres tristis</i>	IV	LC
35	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	IV	LC
36	Clamorous Reed Warbler	<i>Acrocephalus tentoreus</i>	IV	LC
37	Common Kingfisher	<i>Alcedo atthis</i>	IV	LC
38	House Crow	<i>Corvus splendens</i>	IV	LC
39	Grey-hooded Warbler	<i>Seicercus xanthoschistos</i>	IV	LC
40	Ashy Drongo	<i>Dicrurus leucophaeus</i>	IV	LC
41	Asian Koel	<i>Eudynamis scolopacea</i>	IV	LC
42	Cattle Egret	<i>Bubulcus ibis</i>	IV	LC
43	Common Rosefinch	<i>Carpodacus erythrinus</i>	IV	LC
44	Rock Dove	<i>Columba livia</i>	IV	LC
45	Greater Coucal	<i>Centropus sinensis</i>	IV	LC
46	Oriental Magpie Robin	<i>Copsychus saularis</i>	IV	LC
47	Black Drongo	<i>Dicrurus macrocercus</i>	IV	LC
48	Coppersmith Barbet	<i>Megalaima haemacephala</i>	IV	LC
49	Lineated Barbet	<i>Megalaima lineata</i>	IV	LC
50	White Wagtail	<i>Motacilla alba</i>	IV	LC

51	Common Babbler	<i>Turdoidescaudatus</i>	IV	LC
52	Jungle Babbler	<i>Turdoidesstriatus</i>	IV	LC
53	House Sparrow	<i>Passer domesticus</i>	IV	LC
54	Red-vented Bulbul	<i>Pycnonotuscafer</i>	IV	LC
55	Himalayan Bulbul	<i>Pycnonotusleucogenys</i>	IV	LC
56	Alexandrine Parakeet	<i>Psittaculaeupatria</i>	IV	LC
57	Spotted Dove	<i>Streptopeliachinensis</i>	IV	LC
58	Red-wattled Lapwing	<i>Vanellusindicus</i>	IV	LC
59	Red junglefowl	<i>Gallus gallus</i>	IV	LC
60	Asian barred owlet	<i>Glaucidiumcuculoides</i>	IV	LC
61	Rusty Tail Flycatcher	<i>Ficedularuficauda</i>	IV	LC
62	Laughing Thrush	<i>Pterorhinusalbogularis</i>	IV	LC

BUTTERFLY SPECIES

63	Threering plain	<i>Ypthimalycuslycus</i>	II	---
64	Keeled Apollo	<i>Parnassiusjacquemontii</i>	II	---
65	Great Blackvein	<i>Aporianabellica</i>	IV	---

Note: LC: Least Concern, NA: Not Assessed, DD: Data deficient, NT: Near Threatened,

Conclusion-

There is no area which is protected under EPA, 1986 within 10 km radius of study area. Two species are Scheduled I under WPA, 1972. The project does not involve any activity which will have any adverse impact on Schedule-I Species. However, consideration has to be given to mine run offs to make sure nearby stream stays free of any impact from the project. Hence, after application of mitigation measures to handle mine run offs, there will not be any impact on the aquatic life of the stream.

CHAPTER -4

**ANTICIPATED ENVIRONMENTAL
IMPACTS AND MITIGATION
MEASURES**

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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CHAPTER-4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES



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CHAPTER-4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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4.0 GENERAL

All industrial and/or development projects are likely to have an impact on the natural set up of the environment. This impact may be beneficial or adverse, depending on the improvement or the deterioration it brings, about change in the status of air, water, land, ecology, natural systems, socio-cultural life styles and economics of the population. Depending on the nature of activities and baseline environment status, the impacts are assessed for their importance. On the basis of the impact analysis, the mitigating action and future monitoring requirement are paid attention to in the Environmental Management Plan for countering or minimizing the impacts.

Keeping in mind, the environmental baseline scenario as detailed in Section III and the proposed mining activity described in Section II, it is attempted to assess the likely impact and its extent on various environmental parameters and likely mitigation measures to be adopted. This Chapter provides a brief overview of the potential impacts on various environmental components due to the proposed opencast mining activities. The opencast mining operations in general cause environmental degradation and if adequate control measures are not taken to prevent/mitigate the adverse environmental impacts, these operations may cause irreversible damage to the ecosystem. The environmental parameters most commonly affected by mining activities are, Topography and drainage; Air quality including Climate, Noise levels, Water resources and quality, Land use Pattern, Soil quality, Flora and Fauna, Socio-Economic conditions, Occupational Health. Various environmental impacts, which have been identified due to the mining activities, are discussed in the following sections and mitigation measures are suggested.

4.1 LAND ENVIRONMENT

The proposed opencast mine will result in change of land use pattern of the mining lease 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. The potential adverse impact of opencast mining is the change in land use pattern. So reclamation of mined out land will be given due importance as a step for land resource management.

(a) Impact on land use & reclamation of mined out areas

Land use indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc. The impact on land form or physiography will be land use on the hilly terrain will undergo radical changes due to the open cast mining. During the first five years mining, land will be degraded due to mining & allied activities. The breakup of the land to be affected during the first five years due to mining operation is given as below-

Activities	At Present (Ha.)	At End Of Plan Period (Ha.)
Pits and quarries	0.427	1.127
Waste Dump	-	-
Habitation	-	-
Foot track/PWD road	0.060	0.080
Drainage	-	-
Remaining undisturbed area	3.297	2.577

At the end of conceptual period, there shall be no mining pits & all the mined-out pit shall be Backfilled /reclaimed to retain its maximum original topography of the area. The mining shall be Carried out from lower levels to upper levels through the formation of benches. During plan period as the mining pit shall reach its maximum economical depth backfilling shall be commenced to restore maximum original topography of one area. The backfilled shall be leveled & put it use for agriculture.

Top soil – Over burden (top soil) of 1.20 m thickness is available in the applied lease area, which will be stacked separately & simultaneously used for plantation purposes. The waste generated during proposed mining activities will be mainly being in the form of mineral and mineral loss during loading, unloading and transportation. Measures like partially backfilling will be required for reclamation of land affected due to mining and waste dumping to improve the aestheticism of the area as well as to protect the land environment.

Mitigation measures –

- Geological and geo-technical study should be taken into consideration for safe and economic mining retaining walls will be made along Nallas, dumping areas, backfilled areas and unstable slopes. Design of retaining walls will depend on findings of geo-technical investigations and other protective measures will be taken as and when required. Updating of geological plan will be periodically done.
- Retaining walls will be constructed near the mining pit where mining is done to prevent flow of water in the mining pits during rains.
- Siltation tanks can be built up on the canals for collection of silts so that only clean water passes out of the mining lease area in subsequent years when mining will be done at the places where canal bodies are flowing near the mining pits retaining wall will be provided on both sides and check dams will be accordingly constructed.
- Mining is done from top to bottom and simultaneously backfilling is done by constructing retaining wall at the Bottom.

(b) Solid waste generation and management

Solid waste is generated at the project site. Below soil cover boulders of weathered magnesite & Dolomitic occurs having average thickness 2.0 m & same is treated as overburden/waste material. All quantities of waste material to be generated each year shall be dumped with in lease area secured with Gravity retaining wall (Gravity retaining wall having width & height 2.0 m & 1.0 m shall also be erected at the base of backfilled pit at the base & side of dump). All quantities of waste generated during plan period shall be used for backfilling the mined-out pits. The dumps are temporary in nature & all quantities shall be used in premature back filling over mined out pit before commencement of monsoon. After over the monsoon, the waste material shall be rehandled from mining pits & dump on the earmarked dump area. From third year onwards all quantities of waste material shall be used in backfilling.

Waste generation from Working Mules at the Mining lease Area

There are sloppy terrains in hilly regions and so metalled roads cannot be constructed anywhere. Soapstone is a kind of mineral found in various hilly regions and areas where roads are

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connected to haul paths which are poorly maintained and also “Kuccha” in nature. To load the mineral in trucks for market, it needed to be transported by mules (khachhars) from the haul paths to the main metalled road.

Maximum Per Day Production	: 64275 kg/day
Carrying capacity of mules in a day	: 1000 kg/day
Number of Mules deployed Per day	: 65 mules/day
Waste generated by a mule in a day	: 8 kg/day
Total Waste generated by mules in a day	: 520 kg/day
Number of Biogas Plant	: 2 (Nearby Villages)
Capacity of Biogas plant	: Plant size 25 m ³ (Minimum number of cattle required -45)
1 Kg of Dung cake will produce	: 40 liter of Biogas
520 Kg of waste from 65 cattle	: 33,800 liter of Gas production from 2 Biogas Plants each
Number of households benefitted	: More than 1000

Total 65 mules needed to be deployed by the proponent for mineral transportation and so 520 kg/day of waste is being excreted by mules. The waste is being collected simultaneously by the labors on their way back and collected by mule operators in a separate bag tied on the mule, and dumped or collected at a specific location of the mining lease area which is not under operation at that time. Of this large amount of waste, portions of this can be taken away by the local people for vermicomposting or composting or as manure to their fields. Rest of the Waste will be transported at the end of the day to the nearby biogas facility. Biogas plant will be constructed after due discussion and consultation with the Gram Panchayat.

Biogas- It mainly comprises of hydrocarbon which is combustible and can produce heat and energy when burnt. Bio-gas is produced through a bio-chemical process in which certain types of bacteria convert the biological wastes into useful bio-gas. Although, cattle dung has been

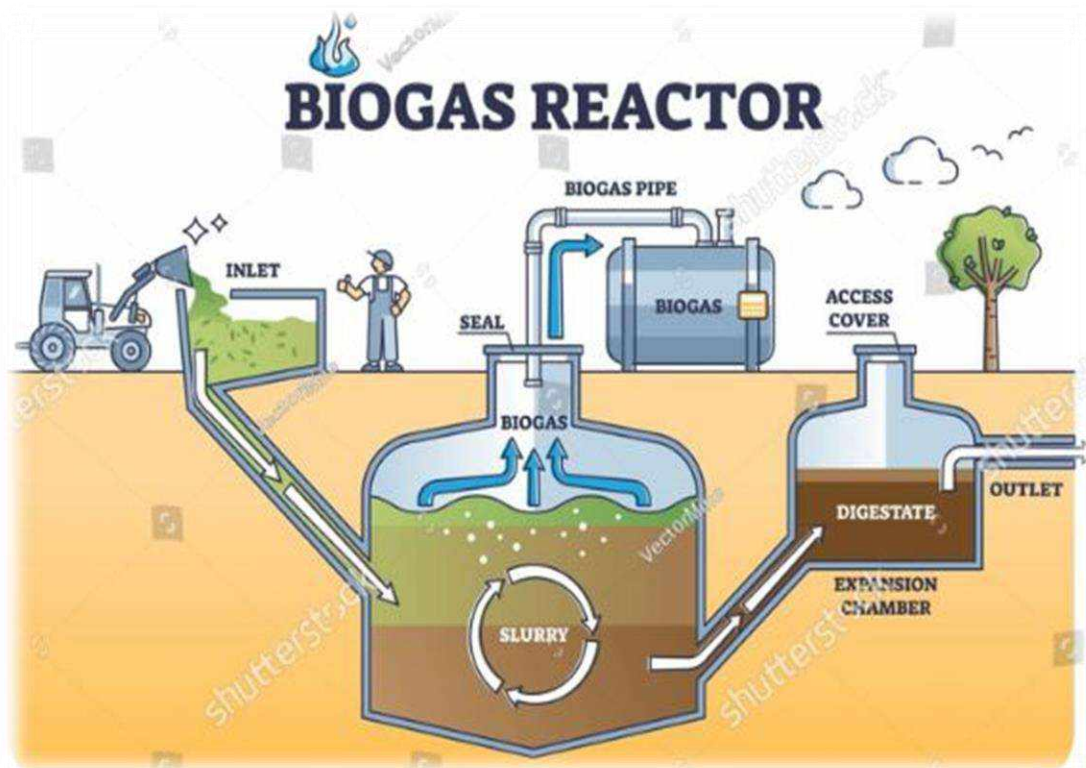


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recognized as the chief raw material for biogas plants, other materials like night-soil, poultry and agricultural wastes can also be used. Biogas plants are being promoted by Uttarakhand Government under National Biogas & Manure Management Programme and Khadi & Village Industries Committee. A biogas plant of 25m³ can be proposed with consultation of the local villagers in the nearby village, where the mule waste is consumed for a greener energy.



There are several benefits from the Biogas Plant, some of them are mentioned below-

- Promotion of Green Energy
- Waste generated is being consumed causing no wastage in and around the lease area.
- Local people will not be exposed to fumes of burning woods and will be able to live in a cleaner environment, by using biogas for household works.
- Large amount of manure production, can bring business of selling it to the market or nearby villages for agricultural purposes.
- Manure generated as residue after biogas generation can be used in agricultural activity



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4.2 WATER ENVIRONMENT

Damage in the water body, depends on its assimilative capacity and the distance of water body from the mining lease area. Mining lease area is approx 3 km away from water body. To find out assimilative capacity of receiving water body, water samples were collected from different groundwater and surface water sources. The study indicates that assimilative capacity of the River water bodies still exists, but effective measures shall be taken to check water pollution. To find out the effect on ground water an extensive hydro-geological study has been conducted and from the study it can be safely concluded that there is no noticeable adverse effect on surrounding ground water resource due to mining. The mining activity does not require water. Mining of soapstone does not have any significant impact on the water quality and parameters as the mining does not intercept with the ground water level. In this project, it is not proposed to divert or truncate any stream. No proposal is envisaged for pumping of water from the river. There will not be any adverse impact on surface hydrology and ground water regime due to this project. As the mining pits will be filled back before monsoon season therefore, there is no any water collection and stagnation at the lease area. Thus, the project activities shall not have any adverse effect on the physical components of the environment and therefore may not have any effect on the recharge of ground waters or affect the water quality.

(a) Impact on Water Resources & Surface Water Resources:

The topography of the area will not be largely changed in view of the proposed concurrent reclamation. No surface water body exists in core zone or passes through the lease area. During the mining activity period, there is a possibility of mixing of freshly disturbed material with the rain water. To take care of such events, retaining walls have been provided along the backfilled pits and along the soil and inter-burden dumps. Before the commencement of rain all the mining pits shall be backfilled so that rain water does not accumulate in the mining pits. Rain water will be channelized along the slopes it shall not carry suspension to natural streams.

- At the top of the mining pit, waste dumps, top-soil dumps garland drains will be constructed so that water does not fall over the mining benches.
- At the toe of the waste dumps, top-soil dumps toe wall be constructed and dumps will be

- On the slopes of the dumps grass/plantation will be done to prevent erosion of dumps.
- At all the time it is necessary that topsoil will not be allowed to mix with waste rock, separate stacking and also when rehandling will be done, it will also be done separately so that precious topsoil is not wasted and properly conserved and utilized at all the stages of stacking and backfilling.

4.3 AIR ENVIRONMENT

Proposed Soapstone mine where emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) contributed by vehicles movement were considered marginal as branded make and vehicles with PUC certificate will be operated only. Fugitive dust and particulates are major pollutants which will occur 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 at the 10 km radius of study area due to mining activities.

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

- Impact due to wind erosion & road maintenance
- Loading and unloading of mineral and OB,IB
- Transportation on the haul road

Water tankers with spraying arrangement of sprinklers with high efficiency will be used for regular water sprinkling on the haul roads to ensure effective dust suppression. The trucks and tippers are well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and un-burnt hydrocarbons.

Control of Fugitive Emissions

- Use of Personal Protection Equipment (PPE) like dust masks, ear plugs etc. by the mine workers.
- No Blasting will be done.
- Regular water sprinkling on haul roads & loading points will be carried out.
- Development of green belt/plantation around the lease boundary, roads, dumps etc.
- Ambient Air Quality Monitoring will be conducted on regularly basis to

assess the quality of ambient air.

Emissions due to mineral handling during mining operation are not much and restricted to the lease area only. Air pollution is caused mainly due to dust generation added with gaseous emission from transportation activities along with mining operation like evacuation, loading, haulage etc. Proper mitigation measures will be practiced during mining activities to control air pollution load below the prescribed limits. The same are as follows:

Prevention and control of Gaseous Pollution

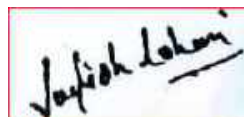
- In mining activities, the sources of gaseous emissions would be through truck movements
- Proper maintenance of vehicles improves combustion process & makes reduction in the pollution. Good maintenance and monitoring of fuel and oil will not allow significant addition in the gaseous emission.
- All the vehicles used will have PUC certificate.
- Taxi mode of vehicles carrying mined out material while loading and unloading will not be allowed.
- Vehicles carrying mineral will be covered with tarpaulin sheet. This will prevent dust emission.

4.4 NOISE ENVIRONMENT

Noise Environment

Noise generated at the mine is due to semi-mechanized mining operations, mechanized loading and truck transportation activities. The noise generated by the mining activity dissipates within the mine. However, pronounced effect of above noise levels is felt only near the active working area. The impact of noise on the villages is negligible as the villages are far located from the mine workings. Since there is no involvement of machinery, the impact of noise levels will be minimal.

(a) Noise Abatement and Control



In this mine the noise level will be up to tolerable limit (70 dB (A)) and the noise level can be reduced by:

- Proper maintenance, oiling and greasing of transport vehicles at regular intervals will be done to reduce the generation of noise.
- Adequate silencers will be provided in all the vehicles.
- Plantation along the sides of approach roads, around office building and mine area will be done to minimize the propagation of noise.
- Personal Protective Equipment (PPE) like earmuffs/earplugs will be provided to all operators and employees working near mining machineries or at higher noise zone.
- Periodical noise level monitoring will be done.

The noise level in the working environment are compared with the standards prescribed by Occupational Safety and Health Administration (OSHA-USA) which has been adopted and enforced by the Govt. of India through model rules framed under Factories Act, 1980 and CPCB 2000 norms. The summary of the permissible exposures in cases of continuous noise as per above rules is given below:

Table-4.1: Noise Impact

Total time of exposure per day in hour	Sound pressure dB(A)	Remarks
(1)	(2)	(3)
8.0	90	No exposure in excess of 115 dB(A) is permissible
6.0	92	--
4.0	95	For any period of exposure falling in between any figure and lower figure as indicated in column (1), the permissible sound is to be determined by
3.0	97	
2.0	100	
1 ½	102	
1	105	

$\frac{3}{4}$	107	extrapolation or proportionate scale.
$\frac{1}{2}$	110	
$\frac{1}{4}$	115	

The off-site receptors are not significantly affected as they are located far away from the mine site. But some disturbances due to vehicle movement cannot be avoided. Plantation will be done along the barrier zone and roadsides etc. which will more or less dampen the off-site noise level.

4.5 BIOLOGICAL ENVIRONMENT

The baseline flora and fauna has been depicted in Chapter-3. There is no National Parks, Sanctuary, Breeding, roosting places or ecologically sensitive areas within the 10 km periphery of the mine lease area. However, most of the area surrounding to project site are covered with forest land. No loss of forest resource is envisaged due to the project. No medicinal plants exist in the area.

Impact on Biodiversity

Present data have been collected through direct inventory as well as various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre-project biological environmental conditions. There are no endangered species, wildlife sanctuary, wildlife corridors, faunal migratory routes or eco-sensitive area near the whole study area. Save the flora/fauna around the project area, is one of the basic objective of present project. For this, mine owner agency will plant a good roadside plantation along both side of the mine road.

Plantation shall be carried out side the lease area over van panchayat land & shall be undertaken all along prominent wind direction to arrest the airborne dust particulate matter. The

Tree species to be planted is as below:

Trees: *Prunus persica* (**Peach**), *Boswellia serrata* (**Salai**), *Juglans spp* (**Walnut**) and *Embllica officinalis* (**Amla**), *Mangifera indica* (**Aam**), *Betula utilis D. Don* (**Bhojpatra**), *Myrica esculenta* (**Buch**) (**Kaaphal**),

Impact on Agriculture

The mine area and the surrounding is all agricultural land. Area comes under Agricultural area. The mining shall be carried out from lower levels to upper levels through the Formation of benches. During plan period as the mining pit shall reach its maximum economical Depth backfilling shall be commenced to restore maximum original topography of one area. The Backfilled shall again utilize for agriculture purpose.

Impacts on aquatic ecology

Mining activities may result in affecting the riverine ecology by polluting the river water. But in this case, Rivers lies almost 5km or more away from mine site and also nothing is being discharged into the River. Thus, it is recommended that adequate surveillance measures are implemented during project operation phase to ameliorate such impacts.

Mitigation Measures

There is a requirement to establish a stable ecosystem with both ecological and economic returns. Minimization of soil erosion and dust pollution enhances the aesthetic value of the core and the buffer zone. To achieve this, it is planned to increase the area of green cover of plantation and green belts activities. The basic objectives of plantations are as follows:

- Improvement of Soil quality,
- Quick vegetative cover to check soil erosion,
- Improvement in mining site stability,
- Conservation of biological diversity of plants, birds and animals,
- As dust receptor and dust filter, this is likely to be produced during mining.
- If birds are noticed crossing the core zone, they will not be disturbed at all;
- Labors will not be allowed to discards food, plastic etc., which can attract animals/birds near the core site;
- Only low polluting vehicles having PUC will be allowed for carrying mining materials.
- Noise level will be maintained within permissible limit (silent zone-50dB (A) during day time or residential zone 55dB (A)) as per noise

Pollution (regulation and control), rules, 2000, CPCB norms.

4.6 SOCIO – ECONOMIC ENVIRONMENT

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. 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. Proposed project will provide employment to local population and preference will be given to the local people whenever there is requirement of man power.

Impact on population composition

The impact of the proposed mining project on population composition will be marginal as there will be no major immigration of people from distant areas.

Impact on employment generation

The proposed mining project is expected to provide Direct and Indirect employment opportunities to local people of different skills and trades.

Impact on road development

Movement of trucks and other vehicles to and fro the quarry is expected to increase, when mining will start. There is mule road connectivity from the quarry to existing road. The existing roads connecting the quarry with the state highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved by making them paved roads. Hence, there is ample scope for road development in and around the mining areas. It is suggested that concerned department in the Government of the state to undertake widening and strengthening of existing roads connecting the mining sites on priority basis. There should also be budgetary support for road development in and around the mining areas.

4.7 TRAFFIC ANALYSIS

Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. Then depending on the capacity of the

mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity.

Table 4.2 (i): Existing No. of Day count Vehicles (Inventory)

S. no	Traffic Vehicle	No. of vehicles per day count Village Road	No. of vehicles per day count NH-309/A	Factor	Equivalent Passenger Car Unit Village Road	Equivalent Passenger Car Unit NH-309/A
1.	H.M.V	60	620	3	180	1860
2.	L.M.V	73	460	1	73	460
3.	Two/ three wheelers	150	550	0.5	75	275
4.	Others	0	0	-	-	0
	Total	283	1630		328	2595

Table 4.2 (ii): Existing Traffic Scenario & LOS

Road	V	C	Existing V/C Ratio	LOS
Village Road	328	2000	0.164	A
NH-309/A	2595	15000	0.173	A

V= Volume in PCU's/hr & C= Capacity in PCU's/ hr

The existing Level of Service is "A" i.e. Excellent

V/C	LOS	Performance
0.0 - 0.2	A	Excellent
0.2 - 0.4	B	Very Good

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0.4 - 0.6	C	Good / Average / Fair
0.6 - 0.8	D	Poor
0.8 - 1.0	E	Very Poor

Note: Capacity as per IRC: 64-1990 Page No. 11-12 for arterial road/ Highways

During Mine operation

Total Capacity of mine : 15426 Tonnes per annum
 No. of working days : 240 days
 Per Day Production : 64.275 Tonnes
 Tripper Capacity : 10 tonnes
 No. of trucks deployed per day : 7 trucks
 No of Trips/day to & fro : 14 trucks

Considering both loaded & empty trucks

Increase in PCU/day will be 42 PCUs

Table 4.2 (iii): Modified No. of Day count Vehicles (inventory)

S. no.	Traffic Vehicle	No. of vehicles per day count Village Road	No. of vehicles per day count NH-309/A	Factor	Equivalent Passenger Car Unit Village Road	Equivalent Passenger Car Unit NH-309/A
1.	H.M.V	60+14=84	620+14=634	3	252	1902
2.	L.M.V	73	460	1	73	460
3.	Two/ three wheelers	150	550	0.5	75	275



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4.	Others	0	0	-	-	0
	Total	307	1644		400	2637

Table 4.2 (iv): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
Village Road	400	2000	0.2	B
NH-309/A	2637	15000	0.1758	A

Results

From the above analysis it can be seen that the V/C ratio for mines w.r.t Village Road is likely to change from 0.164 to 0.2 with LOS being no Change with 'B' as per classification LOS stated above & also for NH 309/A V/C ratio changed from 0.173 to 0.1758 with LOS being same "A" which is 'Excellent' as per classification LOS stated above.

The minerals excavated will be loaded directly into trucks and transported to the concerned market.



Figure-4.1 Transportation Route Map of the Study Area

4.8 PUBLIC HEALTH IMPLICATIONS

With the mitigation measures in relation to air pollution, water pollution, soil contamination and noise pollution proposed to be adopted at the mine along with green belt plantation along the periphery of Mining Lease boundary, it is expected that there will be no impact of mining on the population in the impact zone. However, the following measures shall be adopted:

- Health check of all villagers in the immediate vicinity of the mine shall be carried out periodically.
- Surface water management shall be adopted to ensure that run-off from the mining are does not adversely affect natural water streams or other water bodies.
- All water bodies e.g. wells and surface water sources in the vicinity of the mine, shall be periodically tested for any pollution related to mining operations and remedial action taken, if warranted.
- Operators of all transport vehicles shall be instructed not to honk unnecessarily and not over speed while passing through villages or near schools.

4.9 OVERALL QUALITATIVE AND QUANTITATIVE IMPACT MATRIX

Table 4.3 (i): Qualitative Matrix

	Nature of Likely Impacts								
	Adverse					Beneficial			
	ST	LT	R	IR	L	ST	LT	SI	N
Air Quality	√				√				
Surface Water Quality	√				√				
Ground Water	*	*	*	*	*				
Land Environment	√			√	√				
Noise	√				√				
Soil	√	*	*	√	*				
Forests					√				
Flora & Fauna	√			√	√				
Agriculture					√				
Socio Economic							√	√	

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ST: Short Term LT: Long Term R: Reversible IR: Irreversible

L: Local SI: Significant N: Neutral *: Negligible

Table 4.3 (ii): Quantitative Matrix

Items	With Project		Without Project
	With EMP	Without EMP	
Air Quality	-2	-8	-6
Surface Water Quality	-2	-4	0
Ground Water	0	-6	0
Land Environment	+8	-2	-8
Noise	-2	-6	-4
Flora	+8	-2	-8
Fauna	-2	-6	0
Agriculture	0	0	0
Socio Economic	+8	+4	0
Total	+16	-30	-26

4.10 STATUATORY REQUIREMENTS

Acts dealing with matters relating to the conservation and protection of the environment and which a holder of a mining authorization must also take cognizance of include *inter alia*, the following:

- The Mines Act, 1952
- The Mines and Mineral (Development and Regulation) Act, 1957
- The Mines and Mineral (Development and Regulation) Act, 2015
- Mines Rules, 1955
- Mineral Concession Rules, 1960
- Metalliferous Mines Regulations 1961
- Mineral Conservation and Development Rules, 1988



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Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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IMPACTS AND MITIGATION MEASURES

- Mineral Conservation and Development Rules, 2015
- State Minor Mineral Concession Rules, 1963
- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Forest (Conservation) Act, 1980
- The Wildlife (Protection) Act, 1972
- Uttarakhand Minor mineral Concession rules, 2001



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CHAPTER -5

ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

DEIA
CHAPTER V-ANALYSIS OF ALTERNATIVE
TECHNOLOGY AND SITE

CHAPTER-5

ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE



Cognizance Research India Pvt Ltd
NABET-QCI Accredited Consultant



Varish Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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Varish Lohani

5.1 GENERAL

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. Factors in the choice of an actual mining method for a given deposit are deposit characteristics, percentage recovery, requirement of health and safety and environmental concerns, production, scheduling scope of mechanization and automation, workforce requirements wage rates, and land reclamation, operating and capital cost estimates. The selection of the mining method (development and extraction) is a key decision to be made in the opening up of a mine. Surface or open pit mining is used for large, near-surface mineral deposits. Mineral is excavated, loaded into trucks, and hauled to a facility where it is crushed and ground to a uniform size for further processing. Surface mining requires the removal and disposal of layers of top soil and underlying rock commonly called the overburden. Mining must be planned so that the combine of mining processing and reclaiming the land is taken up concurrently.

The Opencast Mechanized method will be adopted because of the following reasons:

The opencast mining operations ensure higher mineral conservation. The method used for mining is efficient for Soapstone mining, so no alternative mining method is proposed. The Soapstone will be excavated with the help of crow bar & spade and stacked separately. Sorting & sizing of mineral will be carried out manually. Soapstone is a soft material; therefore, no drilling & blasting shall be required. No further beneficiation shall be undertaken during first five years. Different grade of Soapstone will be filled into 50 kg plastic bags & transported the road side by mules. From road side the Soapstone bags will be loaded into trucks manually & transport to destination.

CHAPTER – 6

ENVIRONMENTAL MONITORING PROGRAMME

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

DEIA
CHAPTER VI-ENVIRONMENTAL MONITORING
PROGRAMME

CHAPTER-6

ENVIRONMENTAL MONITORING PROGRAMME



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6.0 INTRODUCTION

The industrial development of any area needs to be intertwined with judicious utilization of non-renewable resources of the study area and within the limits of permissible assimilative capacity. The assimilative capacity of the study area is the maximum amount of pollution load that can be discharged into the environment without affecting the designated use and is governed by dilution, dispersion and removal due to physico-chemical and biological processes.

Regular monitoring of the various environmental parameters is necessary to evaluate the effectiveness of the management programme so that the necessary corrective measures can be taken in case there are some drawbacks in the proposed programme. Since environmental quality parameters at work zone and surrounding areas are important for maintaining sound operating practices of the project in conformity with environmental regulations, the post project monitoring work forms part of Environmental Monitoring Program.

Environmental Monitoring Program will be implemented once the project activity commences.

Environmental monitoring program includes

- (i) Environmental surveillance,
- (ii) Analysis & interpretation of data,
- (iii) Preparation of reports to support environmental management system and
- (iv) Organizational set up responsible for the implementation of the programme.

The Environment Monitoring Programme is required to ensure sustainable development in the study area (10 km) of the project site, hence it needs to be an all-encompassing plan for which the plant authorities, Government, Regulating agencies like Pollution Control Board etc. working in the region and more importantly the affected population of the study area need to extend their co-operation and contribution.

6.1 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges and wastes, for measurement against corporate or statutory standards, consent limits

or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. The preventive approach to environment management may also require monitoring of process inputs, for example, type and method used, resource consumption, equipment and pollution control performance etc.

The key aims of environment monitoring are:

1. To ensure that results /conditions are as forecast during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation.
2. To verify the evaluations made during the planning process, in particular with risk and impact assessments and standard & target setting and to measure operational and process efficiency.
3. Monitoring will also be required to meet compliance with statutory and corporate requirements.
4. Finally, monitoring results provide the basis for auditing i.e. to identify unexpected changes.

6.2 MONITORING METHODOLOGIES AND PARAMETERS

Air Quality Monitoring

Air Quality monitoring is essential for evaluation of the effectiveness of abatement programme and to develop appropriate control measures. Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂) and Nitrogen Dioxide (NO₂) will be monitored at the workplace i.e. core zone. The methodology proposed for is shown below:

Parameters	Technique	Technical Protocol
PM _{2.5}	Gravimetric method	CPCB Guideline Vol. I May' 2011
PM ₁₀	Gravimetric method	IS 5182 (Part-XXIII)
Sulphur Dioxide	Improved West and Gaeke	IS-5182 (Part-II)

Nitrogen Dioxide	Modified Jacob & Hoch heiser	IS-5182 (Part-VI)
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Water Quality Monitoring

Water quality monitoring involves periodical assessment of quality of surface water and the ground water near the mining project.

- Surface water samples will be analyzed for all the parameters as per EPA, 1986
- Ground water samples will be analyzed for all parameters as per IS-10500 (2012).

Soil Quality Monitoring

The soil quality monitoring is carried out to assess the soil characteristic. The soil quality will be analyzed as per CPCB norms.

Noise Level Monitoring

Noise level monitoring will be done for achieving the following objectives:

- a) To compare sound levels with the values specified in noise regulations
- b) To determine the need and extent of noise control of various noise generation sources

Noise level monitoring will be done at the work zone to assess the occupational noise exposure levels. Noise levels will also be monitored at the noise generating sources like mineral handling arrangements, vehicle movements and also at the nearest village for studying the impact due to higher noise levels for taking necessary control measures at the source.

Socio-economic Survey

Socio economic condition will be monitored to assess the demographic particulars of the area including the impacts on the social & economical condition on the residents nearby.

Plantation monitoring programme

Plantation monitoring will be done to ensure survival & growth rate of plantations.

6.3 MONITORING SCHEDULE

The schedule has been shown below for the parameters proposed for monitoring.

Table 6.1- Monitoring Schedule and Parameters

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice a week in each season except monsoon
2	Water Quality (Surface & Groundwater)	Twice a year
3	Soil Quality	Once in a year in project area
4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years
6	Plantation monitoring	Once in a season

6.4 MONITORING SCHEDULE IMPLEMENTATION

An implementation programme has been prepared as it serves no purpose if it is not implemented in letter and spirit. The major attributes of environment are not confined to the mining site alone. Implementation of proposed control measures and monitoring programme has an implication on the surrounding area as well as for the region. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented within the mining area relating to the following specific areas:

- Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
- Collection of soil samples at strategic locations once every two years and analysis thereof with regard to deleterious constituents, if any.
- Measurement of water level fluctuations in the nearby ponds dug wells and bore wells and to assess if mining has got any impact on it or not.
- Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done twice a year for first two years and thereafter once a year.

e) Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

An Environmental Management Cell (EMC) is envisaged which will be responsible for monitoring EMP and its implementation. EMC members should meet periodically to assess the progress and analyze the data collected during the month.

6.5 BUDGET ALLOCATION FOR MONITORING

The EMC will be responsible to carry on the monitoring. Budget allocated has also been proposed for the same:

Table 6.2 Budget allotted for the Environmental Management Plan

EMP BREAK UP			
Environment Management Plan (EMP)		Capital Costs in (Rs.)	Recurring Cost
A	Haulage Road Repair & Maintenance Filling, Leveling and widening of the road up to width of 5m. Setting & Fixing of Cut Stone on the leveled road.	Annual 500 m (L) x 5 m (W)=2500m ²	1,00,000
B	Water Sprinkling on Haulage Road for Dust Suppression	Assuming Rs.2000/day for 240 days of working Tanker Cost: Rs. 1000/Tanker Tanker Capacity: 5000 liter, No. of Tankers required: 2	2,40,000
C	Environmental Monitoring & Compliances.	Half Yearly Monitoring of Environmental Parameters viz. Air, water, Noise & Soil. Half Yearly Submission of Compliances.	1,00,000
D	Plantation along the road side & post plantation care	3,80,000 Plantation @200/sapling (1900 sapling)	1,50,000

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		.	
E	Corporate Social Responsibility	3,30,000	
F	Biogas Plant (Construction and maintenance)	2,00,000/- (Construction cost)	50,000 (waste collection, transportation, fodder for mules)
Total		9,10,000 Lakh	Rs.6,40,000 (Lakhs)

6.6 REPORTING SCHEDULES OF THE MONITORING DATA

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken. The environmental monitoring cell shall co-ordinate all monitoring programmes at site to furnish the data to the State regulatory agencies regularly in respect of the stipulated prior environmental clearance terms and conditions.

The proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and also the details of website where it is displayed.



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CHAPTER – 7

ADDITIONAL STUDIES

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

DEIA
CHAPTER VII- ADDITIONAL STUDIES

CHAPTER – 7

ADDITIONAL STUDIES



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Proponent: M/s Dhaulinaag Mines & Minerals
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Yashish Lohani

7.0 PUBLIC CONSULTATION

Detail will be provided in final EIA report, after conducting Public Hearing.

7.1 RISK ASSESSMENT

Human health and Environmental risk from developmental activities is mainly due to occurrence of some accident consisting of an event or sequence of events like explosion, fire and toxic hazards. Risk analysis provides a numerical measure of the risk that a particular facility poses to the public. It begins with the identification of probable hazardous events at an operational area and categorization as per the predetermined criteria. The consequences of major events or accidents are calculated for different combinations of weather conditions to stimulate worst possible scenario.

These predictions of consequences are combined to provide numerical measures of the risk for the entire facility. Risk assessment should be done on the basis of past accident analysis at similar projects, previous judgments and expertise in the field of risk analysis especially in accident analysis. The complete mining operation will be carried out under the management control and direction of a qualified mine manager.

In order to take care of above hazard/disasters, the following control measures will be adopted:

- All safety precautions and provisions of Mine Act 1951, Metalliferous Mines Regulations 1961 and Mines Rules, 1955 will be strictly followed during all mining operations;
- Training programme for all the employees working in hazardous premises; Under Mines rules all employees of mines shall have to undergo the training at a regular interval;
- Working of mine, as per approved plans and regularly updating the mine plans;
- Suppression of dust on the haulage roads and loading & unloading points;

7.2 DISASTER MANAGEMENT PLAN

The Disaster Management Plan is aimed to ensure safety of life, protection of environment, protection of installation and restoration of production. For effective implementation of the Disaster Management Plan, it should be widely circulated and personnel training should be given. Maximum depth of working has been concentrated 12 m. There is no problem of ground water/ surface water. No causes of disaster have been apprehended during mining activity, but possibility of disaster

cannot be ruled out. Therefore, all the statutory precautions shall be undertaken into account as per mines act.1952, mines rules 1955, MMR 1961. Disaster management plan is comprehensive and structured system for ensuring the prevention of risks/ disasters involved. The principles used to priorities work are as follows.

- Priority must be given to human safety and health, where it is seriously threatened.
- Acute problem must be addressed before long – term problem.
- Measures affecting a large population must be given priority over measures benefiting a smaller number of people.

A major emergency in a mine is one that may cause injury or loss to the workers engaged in the mining and allied operations. Therefore, the first action under the disaster management is the identification of risks involved and their priorities. From this risk assessment the identified are as below:

- Slope Failures in open pit.
- Solid waste generation, their disposal and rehabilitation.
- Proper training on the use of equipment.
- Development of green barrier to contain air and noise pollution.

Each parameter is discussed below:

1. Slope failures:

The mining is proposed from top level and gradually advance towards lower levels. Height of benches will be kept 6.0m. In that case chances of slope will be negligible. However, considering for steeper slope failure studies will be undertaken in future.

2. Solid waste generation, their disposal and rehabilitation:

Solid waste is generated at the project site. Below soil cover boulders of weathered magnesite & Dolomitic occurs having average thickness 1.80m & same is treated as overburden/waste Material. All quantities of waste material to be generated each year shall be dumped with in lease Area secured with Gravity retaining wall (Gravity retaining wall having width & height 2.0m

& 1.0m shall also be erected at the base of backfilled pit at the base & side of dump).

All quantities of waste generated during plan period shall be used for backfilling the mined-out pits. The dumps are temporary in nature & all quantities shall be used in premature back filling over mined out pit before commencement of monsoon. After over the monsoon, the waste material shall be rehandled from mining pits & dump on the earmarked dump area. From third year onwards all quantities of waste material shall be used in backfilling.

Waste generation from Working Mules at the Mining lease Area

There are sloppy terrains in hilly regions and so metalled roads cannot be constructed anywhere. Soapstone is a kind of mineral found in various hilly regions and areas where roads are connected to haul paths which are poorly maintained and also “Kuccha” in nature. To load the mineral in trucks for market, it needed to be transported by mules (khachhars) from the haul paths to the main metalled road.

Total 65 mules needed to be deployed by the proponent for mineral transportation and so 520 kg/day of waste is being excreted by mules. The waste is being collected simultaneously by the labors on their way back and collected by mule operators in a separate bag tied on the mule, and dumped or collected at a specific location of the mining lease area which is not under operation at that time. Of this large amount of waste, portions of this can be taken away by the local people for vermicomposting or composting or as manure to their fields. Rest of the Waste will be transported at the end of the day to the nearby biogas facility. Biogas plant will be constructed after due discussion and consultation with the Gram Panchayat.

3. Proper training on the use of equipment:

Machineries will be employed in the mine. Vocational training programme will be organized in every in every week to train the workers about mine workings & operating the machines.

4. Development of Green belt:

- A green belt will be developed so that minimum soil erosion takes place.
- The excavated soil will be spread over the backfilled mined out area in order to minimize the impact on environment.
- In any case the natural habitats of the existing flora and fauna will not be disturbed.

- Use of traditional knowledge in all aspects of conservation shall be utilized.
- Water conservation techniques will be employed.

5. Care and Maintenance during temporary Discontinuance:

At the time of temporary discontinuance of mine, notice of Directorate General of Mine safety as well to district administration. All precautionary steps shall be taken into account in respect of care & maintenance.

6. Earthquake Management Plan

It will be open cast mechanized mine. Excavator shall be deployed for the removal of overburden & interburden. Mining shall be carried out in two pits viz. pit I & II. The soapstone will be extracted manually with the help of crow bar, chisels, pickaxe, hammers, spade etc. as well as with deployment of excavator. 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 plastic bags & transported up to road side yard manually. From road side the soapstone bags will be loaded into trucks through manually and transported to nearest Haldwani.

7. Flood Management Plan

This is a soapstone mining project and the site is not close by to a water body so water bodies in the area will not be disturbed.

7.3 RISK ABATEMENT

The following precautionary measures shall be taken to prevent any accident

- Elimination of the source of hazard
- Substitution of hazardous process and materials by those which are less hazardous
- Geographical/ physical isolation of hazards from vulnerable communities
- Use of engineering controls to reduce the health risk
- Adoption of safe working practices such as regular equipment maintenance
- Use of Personal Protective Equipment should be mandatory
- Top edge of opencast workings shall be kept properly fenced

- Quarrying shall be done from top downwards. No overhang will be allowed.
- Special attention and requisite provisions shall be taken while working in areas of geological weakness like existence of slip, fault etc.
- Regular dressing of bench sides to ensure safety of workers employed within 5m or working face.
- Provision of safety belt or rope while persons are at work at the quarry sides or benches from where there are chances of falling down for more than 1.8m.
- Spoil banks not to be retained by artificial means at an angle of repose in excess of its natural angle.
- Drafting and implementation of preventive maintenance schedule for various kinds of machinery deployed in opencast workings.
- Provision of maintenance of properly laid haul roads with parapet wall fencing or guards and road signs at strategic points.
- Transportation of soapstone within mine workings by vehicles under the direction, supervision and control of Mine Management only.
- Proper maintenance of vehicles and weekly examination by an engineer and daily examination by a competent person.
- Training and retraining (at specified interval) of the machinery operators.
- Adequate maintenance of electrical equipment.

7.4 SOCIAL IMPACT ASSESSMENT, REHABILITATION & RESETTLEMENT (R&R) ACTION PLAN

In this part of the EIA report an attempt has been made to assess the Socio-Economic impact of the proposed Soapstone mining project. The soapstone will be extracted by Open cast manual cum semi mechanized method. Socio-Economic Impact Assessment (SEIA) refers to the systematic analysis of various social and economic characteristics of the human beings living in the geographical / study area around the proposed project location. The various attributes that have been taken into account are population composition, employment generation, occupational shift, household income, consumption pattern, ethnic issue and law & order problem. The key

objective of the study is to assess possible impact of the project on socio-economic life of the people in the neighborhood known as study area.

a) The objectives of the socio-economic impact assessment are as follows:

- To collect baseline data of the study area.
- To know the socio-economic status of the people living in the study area of the proposed mining project.
- To assess the possible impact of the project on socio-economic aspects in the study area.
- To measure the impact of the project on Quality of life of the people in the study area.

Approach & Methodology

- b) Research approach plays an important role to decide suitable methodology. It helps to develop research design and increase the effectiveness of research study. In the present study inductive approach has been adopted, which is a bottom top approach.
- c) For composite Socio-Economic Impact Assessment of projects, systematic analysis of the various socio-economic characteristics, both in terms of quality and quantity is being carried out.
- d) Accordingly, both qualitative and quantitative data was collected from secondary sources. The secondary data was collected from the published data / information of the Census Authority. Records of the state and district administration were also referred to.
- e) For collection of primary data, a sample survey was conducted in the study area which spans a radius of 10 km from the periphery of the boundary of the project site. In each selected habitation, a specified number of representative households were selected for collection of information through face to face interviews with head of the household or any responsible member of the family.
- f) The details regarding population composition, number of literates, workers, etc have been collected from secondary sources and analyzed. Also village/city/town wise details regarding amenities available in the study area have been collected from secondary sources like Census 2011, and analyzed.
- g) Two stage sampling design has been adopted to select the sampling units. The first stage units are census villages in the rural areas and towns/cities in urban areas. The ultimate stage

units are households in the selected villages and towns/cities. Probability sampling has been adopted to select the sampling units.

- h) Estimation of various parameters has been made based on sample data and bottom top approach has been adopted.
- i) On the basis of a preliminary reconnaissance survey, two questionnaires were developed to make it suitable to fulfill the objectives of the study. The questionnaires contained both open ended and close ended questions
- j) The data collected during the above survey was analyzed to evaluate the prevailing socio-economic profile of the area.
- k) Based on the above data, impacts due to mining operation on the community have been assessed and recommendations for improvement have been made.

Concept & Definition of Terms Used

- a) **Study Area:** The study area, also known as impact area has been defined as the sum total of core area and buffer area with a radius of 10 Kilometers from the periphery of the project site. The study area includes all the land marks both natural and manmade, falling therein.
- b) **QoL:** The Quality of Life (QoL) refers to degree to which a person enjoys the important possibilities of his/her life. The 'Possibilities' result from the opportunities and limitations, each person has in his/her life and reflect the interaction of personal and environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristic.
- c) **Household:** A group of persons who normally live together and take their meals from a common kitchen are called a household. Persons living in a household may be related or unrelated or a mix of both. However, if a group of related or unrelated persons live in a house but do not take their meals from the common kitchen, then they are not part of a common household. Each such person is treated as a separate household. There may be one member households, two member households or multi-member households.
- d) **Sex Ratio:** Sex ratio is the ratio of females to males in a given population. It is expressed as 'number of females per 1000 males.

- e) **Literates:** All persons aged 7 years and above who can both read and write with understanding in any language are taken as literate. It is not necessary for a person to have received any formal education or passed any minimum educational standard for being treated as literate. People who are blind but can read in Braille are also treated as literates.
- f) **Literacy Rate:** Literacy rate of population is defined as the percentage of literates to the total population aged 7 years and above.
- g) **Labour Force:** The labour force is the number of people employed and unemployed in a geographical entity. The size of the labour force is the sum total of persons employed and unemployed. An unemployed person is defined as a person not employed but actively seeking work. Normally, the labour force of a country consists of everyone of working age (commencing from 14 to 16 years) and below retirement (around 65 years) that are participating workers, that is people actively employed or seeking employment. People not counted under labour force are students, retired persons, and stay-at home people, people in prisons, permanently disabled persons and discouraged workers.
- h) **Work:** Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. The work may be part time or full time or unpaid work in a farm, family enterprise or in any other economic activity.
- i) **Worker:** All persons engaged in 'work' are defined as workers. Persons who are engaged in cultivation of land or milk production even solely for domestic consumption are also treated as workers.
- j) **Main Workers:** Those workers who had worked for the major part of the reference period (i.e. 6 months or more in the case of a year) are termed as Main Workers.
- k) **Marginal Workers:** Those workers who did not work for the major part of the reference period (i.e. less than 6 months) are termed as Marginal Workers.
- l) **Work participation rate:** The work participation rate is the ratio between the labour force and the overall size of their cohort (national population of the same age range). In the present

study the work participation rate is defined as the percentage of total workers (main and marginal) to total population.

➤ Study Area

The field investigation has revealed that the entire study area of the proposed Soapstone mining project is located in Village-Garuwa Sirmoli, Tehsil- Kanda & District- Bageshwar. As many as 145 villages are located in the study area and there is no urban area. The Sub- district wise distribution of villages in the Study Area is given in the table below:

Sr. No	Name of the Sub-district	Number of villages
State Uttarakhand, District Bageshwar		
1	Bageshwar	415
2	Garud	180
3	Kanda	156
4	Kapkot	197
Total		948

• Baseline Data

Baseline data refers to basic information collected before a project / scheme is implemented. It is used later to provide a comparison for assessing impact of the project. Any attempt to collect base line data while undertaking impact assessment study is faced with recall errors. The present report is provided with following base line data for the study area as a whole.

Table 3.4 (i) Demographic Particulars of the Study Area

Sr. No.	Description	Number	Percentage to Respective totals
1	Gender wise total Population of the Study area	50259	100
	Male	20563	48.1
	Female	19696	51.9

	Sex Ratio (No. of females per 1000 males)	1080	
2	Gender wise total Population (0-6 age group)	7428	100
	Male	3914	52.7
	Female	3514	47.3
	SexRatioof0-6agegrouppopulation (No. of females per 1000males)	898	
3	Number of Households and household size for the study area	12621	
	Average House Hold size for the study area as a whole	4	
	Highest Household size in the study area	9	
	Lowest Household size in the study area	3	
4	Total Population of Schedule Caste Community in the study area	15571	100
	Male	7799	50.1
	Female	7772	49.9
	Sex Ratio (No. of females per 1000 males)	997	
5	Total Population of Schedule Tribe Community	776	100
	Male	366	47.2
	Female	410	52.8
	Sex Ratio (No. of females per 1000 males)	1120	
6	Total population of General Community (including OBC)	38912	100
	Male	18398	47.3
	Female	20514	52.7

	Sex Ratio of General Community population (including OBC) (No. of females per 1000 males	1115	
7	Total Literates in the study area	38277	100
	Male	20914	54.6
	Female	17363	45.4
	Over all literacy rate in the study area	80.0	
	Male	92.3	
	Female	69.0	
	Gender gap in literacy rate	23.4	
8	Total Workers in the study area	27741	100
	Male	12991	46.8
	Female	14750	53.2
	Overall Gender Gap in work participation rate	6.4	
	Overall Dependency Rate of Non-workers over workers	99.2	
9	Total Main Workers in the study area	18651	100
	Male	8736	46.8
	Female	9915	53.2
	Over all gender gap in work participation rate of main workers	6.4	
10	Total Marginal Workers in the study area	9090	100
	Male	4255	46.8
	Female	4835	53.2
	Overall gender gap in work participation rate of Marginal workers	6.4	
	Total Household Industrial Workers in the	658	100

11	Study Area		
	Male	344	52.3
	Female	314	47.7
12	Total Agricultural Workers in the study Area	22257	100
	Male	8776	39.4
	Female	13481	60.6
13	Total Cultivators in the Study Area	19822	100
	Male	7389	37.3
	Female	12433	62.7
14	Total Agricultural Labour in the Study Area	2435	100
	Male	1387	57.0
	Female	1048	43.0
15	Total 'Other Workers' in the Study Area	4826	100
	Male	3871	80.2
	Female	955	19.8

Various amenities available in the study area are given in the table below:

Table 3.21: Amenities available in the Study Area

S. No	Amenities	Type
1	Educational Institutions	Primary School
		Secondary School
		Senior Secondary School
		Other School
		College
2	Health facilities	Allopathic Hospital/Dispensary
		Ayurvedic Hospital/Dispensary

		Maternity & Child Welfare Centre
		Child welfare Centre
		Community Health Centre
		Registered Medical Practitioners
		Primary Health Centre/Sub Centre
3	Drinking Water	Hand pump
		River
		Spring
		Tap
		Lake
		Other sources of drinking water
4	Electricity	Power for domestic uses Only
		Power for Domestic and Agricultural uses
5	Transport Facilities	Bus Service
		Railway Service
6	Banking Facilities	Commercial bank
		Co-operative Bank
		Agriculture Credit Society
7	Communication Facilities	Post Office
		Telephone

Findings of the Study

- Study Area

The field investigation has revealed that the entire study area of the proposed mining project is located at Village-Garuwa Sirmoli, Tehsil- Kanda & District- Bageshwar. The Sub-district (Tehsil) falling in the study area is Bageshwar. The study area comprises of 145 villages.

Demographic Composition

- Population

According to Census 2011, the total population of the study area is 98898. As there is no urban area the entire population belongs to rural area. The overall sex ratio has been worked out to 825 females per 1000 males, which is much lower than the national average of 936 females per 1000 males. Furthermore, around 21.5 percent of the total population belongs to Schedule Caste community and the Schedule Tribe population in the study area is very negligible as per Census 2011.

- **Number of households and household size**

The entire population of the study area has been grouped into 16465 households and the average household size is 8. The household size varies between 5 and 8.

- **Literacy and Literacy rate**

The total number of literates in the study area has been worked out around 54.40 percent of the total population. The literacy rate of male has been worked out to 59.88 percent as against 39.74 percent for female, creating a gender gap of 35.74 percent.

- **Workers and work participation rate**

The total number of workers in the study area is 8524, which is 19.5 percent of the total population. Among the total workers 52.07 percent are main workers and the remaining 42.2 percent are marginal workers. The percentage of male in the main workers is 66.80percent, while it is only 31.03percent in the case of marginal workers. On the other hand, the percentage share of female in the main workers is only 33.28percent; it is 56.48percent in the case of marginal workers. This indicates that male dominates the main workers and female in the marginal workers.

The classification of workers based on occupation reveals that 83 percent of the total workers are Agricultural workers. The share of cultivators in the total workers is 42 percent and that of Agricultural labors is 41 percent. Barely 4 percent of total workers are Household Industrial Workers and 13 percent are 'Other workers' which includes white collar workers, professional workers, shopkeepers, traders and businessmen.

Possible Impact Assessment

- **Impact on Population Composition**

The impact of the proposed mining project on population composition will be marginal as only few skilled and managerial staff will be recruited from outside and the rest will be recruited locally. The impact will be significant if a large number of people from outside get employed in the proposed project. In that case not only the population of the study area will go up but also the skewed sex ratio may make permanent social effects like rise in exploitation of women, higher crime rate, increase in sexual diseases and depression among youth.

- **Impact on Employment**

The proposed soapstone mining project is expected to provide employment opportunities to 38 persons of which 2 will be skilled workers, 34 will be un-skilled and the remaining 2 will be other (Geologist/Mine Manager) workers. It is understood that all the persons to be deployed for various mining activities will be recruited locally and there is very little scope for migration of people from outside the study area. The employment potentiality of the project is expected to ameliorate the economic condition of the families of those persons who will get employed in the proposed mining project. However, the mining project will provide seasonal employment. Further, the project will provide indirect employment of people who will be involved in segregation of extracted mining materials, crushing of boulders, petty business and service-oriented industries.

- **Increased Supply of Soapstone**

Soapstone Powder is an important industrial mineral. The soapstone powder should be milky white, free from impurities and soapy feel. It is widely used as basic material in Cosmetic and Paper industry. It is an important raw material in the manufacture of talc in the cosmetic industry. It is also used in rubber, paper plastic and other allied industries. There is always a good demand for soapstone for industrial uses. With the commencement of the proposed mining project, the supply of soapstone powder in the domestic market will increase by about 63352 tonnes per annum. This is a direct and positive impact of the upcoming mining project.

- **Impact on Approach Roads**

Movement of trucks and other vehicles to and fro the quarry site is expected to increase substantially, when the operation of the mine will commence. The existing roads connecting the quarry with the national and state highways are mud roads and they are narrow. There will be

mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved by making them paved roads. Hence, there is a wide scope for road development in the area. This is a positive impact of the upcoming mining project.

- **Impact on Law & Order**

Since the workers will attend to their duties from their residence and return to their homes after the day's work is over there will be no law & order problem as such. On the other hand, if the workers are migrants and live in shanties closed to the mining area it may create law & order problem and ethnic issues. To meet any untoward incident one police post may be set up close to the project area.

- **Impact on Vulnerable Groups of People**

No impact is envisaged on vulnerable groups of people that include hospital patients, children, pregnant women and elderly persons. There will be no re-habilitation and re- settlement issues that may adversely affect the people living adjoining the mine lease area. The social welfare activities to be taken up by the mine owner will definitely make positive impact on the living conditions of people including those who fall under vulnerable groups.

- **Income to Government**

In India poverty is widespread. According to an estimate made by World Bank during 2005, 26 percent of the total Indian population falls below the international poverty Line of US\$ 1.25 a day (PPP, in nominal terms ₹ 21.6 a day in urban areas and ₹ 14.3 in rural areas). Uttarakhand is one of the major agro-economical states in India, with per capita income of Rs. 1,76,000. The proposed mining project at Garuwa Sirmoli village is expected to provide casual employment to 38 unskilled workers and 2 skilled workers for a period of 240 days in a year. According to Department of labour, Government of Uttarakhand each unskilled worker is eligible to get a minimum basic wage of Rs. 300 per day. In addition, they will get V.D.A amounting to Rs. 65.50 per day. Thus, the total amount an unskilled worker is expected to get is Rs 365.50 per day. Further, a semi-skilled worker will get a basic wage of Rs 345 and V.D.A amounting to Rs.112.69 making the total amount of Rs. 457.69 per day. Lastly, a skilled worker can expect to get a minimum wage of Rs. 475.24 and V.D.A amounting to Rs. 124.76 making the total amount

of Rs. 600 per day. The impact of the proposed mining activity on household income in the study area is thus positive since it will provide employment to local people, which will result to an increase in household income of those workers who will be recruited for mining operation. However, this impact will be effective for a period of 240 days in a year.

The proposed soapstone mining will bring income for the state government in the form of royalty, dead rent and taxes. This is a positive impact of the project.

- **Impact on Health**

Extraction of soapstone may pose serious health risks if it is not handled carefully. It can affect the body adversely if it is inhaled or if it comes in contract with eyes or skin. Exposure to soapstone may damage the lungs. Shortness of breath, cough, enlargement of the ends of the fingers and heart failure may occur due to continuous exposure to soapstone dust. There are reports of cancer cases among the workers engaged in mining of soapstone. Hence, preventive measures should be taken to protect oneself from the exposure of soapstone, while working in a soapstone mine. This is a negative impact of soapstone mining. The project proponent will undertake the following preventive measures, in order to protect the workers from the exposure of soapstone:

- **Regular medical surveillances**

Regular medical surveillances of the workers will be made. In case anyone get adversely affected due to soapstone mining the miner will be medically examined and provided medical assistances regularly. They will also be medically checked annually.

7.5 SUGGESTIONS

- **Provision of First Aid at mining site**

Extraction of soap stones, from the mining site may pose serious health risks due to dust. To meet any emergency during extraction of the minerals from the mining site and subsequent loading in the transport vehicles, provision for First Aid will be made by the project proponent. Before the affected person is removed to a doctor or health institution for necessary medical aid, the miner will be provided with First Aid.

- **Tie up with the nearest PHC for medical help**

At present there are no adequate health facilities available in the mining village. To meet the medical needs of the mine workers, tie-ups with nearest hospital or Primary Health Center (PHC) will be made. Few beds will exclusively be reserved for the mine workers in the above health institutions. This will ensure timely medical aid to the affected persons.

- **Supply of Masks and Gloves**

The mine workers are subject to respiratory diseases, muscular-skeletal and gastro-intestinal disorders and skin diseases. For protection from dust it will be made compulsory for all mine workers to wear masks and gloves while working in the mines.

- **Health Camps**

The miners may be encouraged to undergo health checkups at regular intervals in order to protect themselves from various diseases. The health Department of Uttarakhand Government must Organize Health Camps at regular intervals preferably in every quarter. Further, free medical facilities may be made available to the workers and their family members.

- **Special telephone number**

A special telephone number will be available to the mine workers. In case of emergency the miners can dial the above number for medical assistances. Vehicle will be provided to the patients in short duration for shifting to the health institution.

- **Special Group Insurance Scheme**

All the mine workers will be covered under a Group Insurance Scheme of LIC or any other Insurance company.

- **Distribution of Blankets and Quilts** - During winter season the mine workers may be distributed blankets and quilts free of cost.

7.6 CONCLUSION

The implementation of the Soapstone mining project will throw opportunities to local people for both direct and indirect employment. Since the quarries will be leased out to successful allottees, soapstone and boulder mining operation in the state will get legalized and it will fetch income to

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the state exchequer. The project will also provide impetus to industrialization of the area. It is likely the intending entrepreneurs will venture to set up micro and small-scale units in the near future making the area a mixed society, dependent on industry, trade and business. At present agriculture is the main occupation of the people as 83 percent of the population depends on it. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in industrial and business activities rather in agriculture. Thus, there will be a gradual shifting of population from agriculture to mining and industry. Further, the mining and industrial activities in the area may lead to rapid increase in population and thereby urbanization. Due to urbanization of the area, employment opportunities will further increase.

The study area is still lacking in education, health, housing, water, electricity etc. It is expected that same will improve to a great extent due to proposed mining project and associated industrial and business activities.

Proposed activities and expenses on Corporate Social Responsibility will be as per CSR Mandate of the Government.



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CHAPTER – 8

PROJECT BENEFITS

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8.0 GENERAL

The execution of the project, bring overall improvement in the locality, neighborhood and the State by bringing industry, roads, employment and hence improving living standard and economic growth.

8.1 PHYSICAL BENEFITS

Improvement in the Physical Infrastructure

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas.

- a. **Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- b. **Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.
- c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the approach road and area demarcated by Gram Panchayat.
- d. **Creation of community assets** (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary & health center, community center, market place etc, as a part of corporate social responsibility.

The impact on the civic amenities will be substantial after the commencement of mining activities. The basic requirement of the community needs will be strengthened by extending health care, educational facilities developed in the township to the community, providing drinking water to the villages, building/strengthening of existing roads in the area. The proponent will initiate the above amenities either by providing or by improving the facilities in the area, which will help in uplifting the living standards of local communities. 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.

8.2 SOCIAL BENEFITS

- 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.
- There will be significant change in the socio-economic scenario of the area.
- The proposed project will enhance the prospects of employment. Recruitment for the unskilled and semiskilled workers for the proposed project will be from the nearby villages.
- The development of the basic amenities viz. roads, transportation, electricity, drinking water, proper sanitation, educational institutions, medical facilities, entertainment, etc. will be developed as far as possible.
- Overall the proposed project will change living standards of the people and improve the socio-economic conditions of the area.

A) Employment Potential- The employment of local people in primary and secondary sectors of project will upgrade the prosperity of the region. These will in-turn improves the socio-economic conditions of the area. The total manpower required for the proposed mining project under various categories is 38 persons and persons will be mainly sourced from local community in and around mining project and few technical persons will be employed during operational phase from local and also from outside area. In addition to the above, contractual labor and indirect employment opportunities will also be getting benefited after installation of mining project.

S. No.	Category (Full Time)	Numbers
1.	Geologist/Consultant Geologist	1
2.	Part time medical officer (1)	-
3.	Part time Environment Consultant (1)	-
4.	Mining Engineer/Mine Manager	1
5.	Supervisor/Skilled workers	2

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6.	Unskilled	34
	Total	38

B) Contribution to the Exchequer as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.

C) Increased Health related activities: Healthcare promotional activities will be undertaken. Pre-placement & and Periodic medical checkups will be done, which will lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp sports will be arranged.

D) Educational attainments: Educational activities will be promoted by the lessee. Awareness program will be arranged covering basic issues related to primary level education, environment, health and hygiene etc.

E) Strengthening of existing community facilities through the Community Development Programme.

Table 8.1 Budget for Corporate Environmental Responsibility (CER)

S no.	Activity	Quantification	Capital cost
1	Provide drinking water facility in surrounding villages and schools by hand pump installation.	-	1,00,000
2	Solar lamp distribution& Solar street light installation	-	1,00,000
3	Free distribution of medicines, health check-up camps nearby village	-	80,000
	Distribution of school bags & Books in nearby Primary Schools		50,000
Total			3,30,000



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Soapstone mine has proposed to provide financial assistance of **Rs. 3.30 lakh** for the development of social infrastructure of the area.

8.3 ENVIRONMENTAL BENEFITS

Enhancement of Green Cover

Plantation/afforestation will be done as per program 1900 plants will be planted along the approach road and area demarcated by Gram Panchayat/Local Administrative body with consultation & permission of concerned authority within 5km from lease boundary along with provision for maintenance for 5 years. Area proposed to be cover under plantation & protection work is 0.80 Ha. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people will also be involved. The management will provide free saplings of fruit and other trees, etc. to local during rain for plantation. This will increase the consciousness in workers and near-by villagers for greenery. Fruit trees can contribute towards their financial gains.

List of the plant species proposed to be planted:

Name of the Species	Local name	Scientific Name	Picture of the species
Peach	Aadu	<i>Prunus persica</i>	







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Walnut	Akhrot	<i>Juglans spp</i>	
Indian Gooseberry	Amla	<i>Emblica officinalis</i>	
Mango	Aam	<i>Mangifera indica</i>	
Himalayan Brich	Bhojpatra	<i>Betula utilis D. Don</i>	





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Bayberry	Kaaphal	<i>Myrica esculenta</i> <i>Buch</i>	
Indian frankincense	Salai	<i>Boswellia serrata</i>	

The year wise plantation is given below:

Year	Outside lease area over Van Panchayat land		Total no. of sapling
	Area (ha.)	No. of saplings	
Ist	0.26	700	700
IInd	0.26	600	600
IIIrd	0.26	600	600
IVth	To Be Maintained	To Be Maintained	To Be Maintained
Vth	To Be Maintained	To Be Maintained	To Be Maintained
Total	0.8	1900	1900



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Fig.8.2- Green belt development around lease boundary & approach road



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CHAPTER – 9
ENVIRONMENTAL MANAGEMENT
PLAN

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ENVIRONMENT MANAGEMENT PLAN



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Vaishali Lohani

9.0 INTRODUCTION

The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area. To mitigate the adverse impact which may be caused due to the mining operations and overall scientific development of local habitat, environmental management plan (EMP) has been formulated and integrated with the mine planning. The details of the anticipated impacts and mitigate measures have been discussed in Section IV of this report, based on the results of present environmental conditions and environmental impact assessment. The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

The mitigation measures which reduce the impact have already been identified earlier in this report. To minimize the adverse impact, certain additional EMP is enumerated below for implementation.

The aims of EMP are:

- Overall conservation of environment.
- Minimization of waste generation and pollution.
- Judicious use of natural resources and water.
- Safety, welfare and good health of the work force and population.
- Ensure effective operation of all control measures.
- Vigilance against probable disasters and accidents.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.

9.1 ENVIRONMENTAL MANAGEMENT PLAN

Proper environmental management plan is proposed for (Soapstone) Mine project to mitigate the impact during the mining operation.

- No overburden or loose sediments will be kept in the vicinity of the working benches.
- The possibility of the project activity contributing to the pollution of water courses of the region or to the ground water regime is so less that this does not significantly constitute an area of concern.
- Construction of well-compacted roads.
- Regular water spraying on haul roads and waste dumps by tankers.
- Provision of dust collectors for the drilling & crusher machines
- Personal Protective Equipment (PPE) like earmuffs/earplugs, dust masks, helmets, safety boots will be provided to all operators and employees working near mining machineries or at higher noise zone.
- Plantation of wide leaf trees, creepers, tall grasses around quarry sites, waste dumps, road and other surrounding barren zones.
- Proper and regular maintenance of vehicles, compressors and jack hammers.
- Provision of supplying earplugs for jackhammer drillers and crusher operators.
- Care should be taken that noise produced during vehicles movement for carrying soapstone and boulder is within the permissible noise level.
- Provision of Green Belt (thick foliage) along the lease boundary and road.
- Strict observance of the provisions of Acts, Rules and Regulations in respect of safety both by management and the workers.
- Proper planning and designing of work in order to reduce the risk of hazards.
- Specific instructions and supervisions of working where danger due to fall of side (overhanging, undercutting of bench, fall of objects from higher benches/places is apprehended).
- Training of work persons and the officials.

- Since the haul path will be of considerable length, due importance will be given in the construction of path. The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- A code of practices for tipping in stock piles/dumping of overburden at dump yard and loading point will be implemented.
- In respect of contract work, safety code for contractors and workers will be implemented.
- They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment will be supplied to them.
- A code of practice for fighting fire will be implemented.
- Competent persons like fitters, mechanics will be imparted with special attention to project impact.
- Provision of pit safety committee meeting every month (20th day) to discuss the safety of the mines and the persons employed.
- Celebration of annual mines safety week and environmental week in order to develop safety awareness amongst employees.
- Pre joining medical checkup shall be done and regular health check-up in 6 monthly intervals is planned for the employees.
- Care will be taken that no cooking, or burning of woods will be allowed in the adjoining area.
- If some causality or injury to animal occurs, it should be informed to forest department and proper treatment should be given.
- Corridor movement of wild mammals (If exists) should be avoided.
- Provision of rest shelters for mine workers with amenities like drinking water etc.
- Periodical Medical Examination (PME) of all workers by a medical Officer
- First Aid facility is provided at the mine site.
- Close surveillance of the factors in working environment and work practices which may affect environment and worker's health.

- Working of mine as per approved mining plan and environmental plans.

9.2 ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

Environmental Management Plan serves no purpose if it is not implemented with true spirit. Some loopholes in the EMP can also be detected afterwards when it is implanted and monitored. Thus, an implementation and monitoring programme has to be prepared.

The major attributes of environment are not confined to the mining site alone. Implementation of proposed control measures and monitoring programme has an implication on the surrounding area as well as for the region. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented within the mining area relating to the following specific areas:

- a) Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
- b) Collection of soil samples at strategic locations once in every year and analysis thereof with regard to deleterious constituents, if any.
- c) The effectiveness of drainage system depends upon proper cleaning of all drains provided in the surrounding of mine area. Any blockage due to siltation or loose material will be checked at least once in a month.
- d) Measurement of water level fluctuations in the nearby ponds, dug wells and bore wells.
- e) Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done in every quarter of the year.
- f) Plantation/afforestation as should be done as per program. Regular watering of plant and fencing to protect them from cattle/goats has to be provided. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

Mine management will be in regular touch with local surrounding villages to update the various developmental schemes made by them. They will also consider any immediate requirement, which could be taken care of in near future.

Mine management will be in regular touch with State Pollution Control Board and Indian Bureau of Mines and send them annual progress report. Any new regulations considered by State/Central Pollution Control Board for the industry will be taken care of.

Greenbelt Development Plan

The greenbelt development plan aims to overall improvement in the environmental conditions of the region. Plantation/afforestation will be done as per program 1900 plants will be planted along the approach road and area demarcated by Gram Panchayat/Local Administrative body with consultation & permission of concerned authority within 5km from lease boundary along with provision for maintenance for 5 years. Area proposed to be cover under plantation & protection work is 0.80 Ha. The following characteristics should be taken into consideration while selecting plant species for green belt development and tree plantation.

- They should be fast growing and tall trees.
- They should be perennial and evergreen.
- They should have thick canopy cover.
- Plantation should be done in appropriate alternate rows around the proposed site to prevent lateral pollution dispersion.
- The trees should maintain regional ecological balance and conform to soil and hydrological conditions. Indigenous species should be preferred

Trees: *Prunus persica* (**Peach**), *Boswellia serrata* (**Salai**), *Juglans spp* (**Walnut**) and *Embllica officinalis* (**Amla**), *Mangifera indica* (**Aam**), *Betula utilis D. Don* (**Bhojpatra**), *Myrica esculenta Buch* (**Kaaphal**),

9.3 ENVIRONMENTAL MANAGEMENT CELL (EMC)

To implement the EMP, a structured Environment Management Cell (EMC) which includes plant manager and representative of consultants interwoven with the existing management system is there. Occupational safety and health is very closely related to productivity and good employer- employee relationship. The factors of occupational health in the proposed soapstone mine are mainly dust and land degradation. Safety of employees during operation and

maintenance etc. shall be as per Mines rules and regulations. To avoid any adverse effect on the health of workers due to various pollutants, sufficient measures relating to safety and health will also be practiced.

A comprehensive environmental monitoring program as laid down by State Pollution Control Board is followed. All the above observations will be complied and documented by the EMC to serve the following purposes:

- Identification of any environmental problems that are occurring in the area.
- Initiating or providing solution to those problems through designed channels and verification of the implementation status.
- Controlling activities inside the project, until the environmental problem has been corrected.
- Suitably responding to emergency situations.

9.4 BUDEGT ALLOCATION FOR EMP IMPLEMENTATION

Annual budget for EMP is very essential for successful implementation of EMP. The fund allocated will not be diverted for any other purposes and the top management will be responsible for this. The budget will take into consideration the following capital and operating expenses:

- a) Capital cost for installing pollution control systems (Field cost for monitoring of parameters).
- b) Man power cost for environmental cell
- c) Any other cost as per EC condition.

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 budget for environmental protection has been formulated and given in Table.

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 Proponent: M/s Dhaulinaag Mines & Minerals
 Village: Garuwa Sirmoli
 Tehsil- Kanda & District-Bageshwar,
 State- Uttarakhand
 Area: 3.784 Ha
 Project Cost- 79.02 Lakh

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Table 9.1 Budget allotted for Environmental Management Plan per annum

EMP BREAK UP			
Environment Management Plan (EMP)		Capital Costs in (Rs.)	Recurring Cost
A	Haulage Road Repair & Maintenance Filling, Leveling and widening of the road up to width of 5m. Setting & Fixing of Cut Stone on the leveled road.	Annual 500 m (L) x 5 m (W)=2500m ²	1,00,000
B	Water Sprinkling on Haulage Road for Dust Suppression	Assuming Rs.2000/day for 240 days of working Tanker Cost: Rs. 1000/Tanker Tanker Capacity: 5000 liter, No. of Tankers required: 2	2,40,000
C	Environmental Monitoring & Compliances.	Half Yearly Monitoring of Environmental Parameters viz. Air, water, Noise & Soil. Half Yearly Submission of Compliances.	1,00,000
D	Plantation along the road side & post plantation care	3,80,000 Plantation@200/sapling (1900 sapling) .	1,50,000
E	Corporate Social Responsibility	3,30,000	
F	Biogas Plant (Construction and maintenance)	2,00,000/- (Construction cost)	50,000 (waste collection, transportation, fodder for mules)
Total		9,10,000 Lakh	Rs.6,40,000 (Lakhs)



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CHAPTER – 10

EXECUTIVE SUMMARTY

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
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Project: Garuwa Sirmoli Soapstone Mining Project
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10.0 INTRODUCTION OF PROJECT & PROPONENT

Environmental Impact Assessment (EIA) is a decision-making tool, 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.

The proposed project of Garuwa Sirmoli Soapstone Mining Project by M/s Dhaulinaag Mines & Minerals is for soap stone mineral mining which covers an area of 3.784 Ha. At Village- Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, Uttarakhand. LOI has been granted in favour of M/s Dhaulinaag Mines & Minerals, vide letter no. 1449/VII-A-1/2021/1 (34)/21 dated – 1th October 2021, for a period of 25 years attached as Annexure II. The EIA-EMP report has been prepared as per the TOR granted under the EIA Notification of September 14th 2006. In order to assess the impact on environment due to proposed mining, it is necessary to ascertain the present status of environment prevailing at the project site and identification and assessment of impacts on the environment of the proposed operations.

As per NGT Order Dated 13-09-2018 and MOEF & CC OM No L-11011/175/2018-IA-II (M) Dated 12-12-2018 the project comes under B1 Category as the area is more than 5 Ha. Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Uttarakhand, under EIA Notification of the MoEF, Ref No. 219/SEIAA Dated 22 February 2023.

10.1 LOCATION

The proposed project of Garuwa Sirmoli Soapstone Mining Project by M/s Dhaulinaag Mines & Minerals is for soap stone mineral mining which covers an area of 3.784 Ha. At Village- Garuwa Sirmoli, Tehsil- Kanda & District-Bageshwar, Uttarakhand. LOI has been granted in favour of M/s Dhaulinaag Mines & Minerals, vide letter no. 1449/VII-A-1/2021/1 (34)/21 dated – 1th October 2021, for a period of 25 years attached as Annexure II. Soapstone finds its uses in all

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aspects of life and commercial business. Soapstone has wide applications across various industries.

Village	Tehsil	District	State	Area in Ha.
Garuwa Sirmoli	Kanda	Bageshwar	Uttarakhand	3.784

Table10.1- Detail of site & surrounding around Lease Area

Nearest Settlements	<ul style="list-style-type: none"> Kanda Village, 600 m in NW direction Dhapti Village, 400 m in SSE direction
Nearest Road	<ul style="list-style-type: none"> Non-Metalled Road, passing through the lease area Village Road – Metalled 350 m in W direction National Highway (NH-309A), Pithoragarh Road, 0.95 km* towards S direction. ODR (Jarti Road.) 5.02 km in North direction. MDR (Dophar- Banlekha Road) 2.21 km in N direction. MDR (Kanda- Rawatsera- Bans Patan Road), 4.15 km in S direction.
Nearest Airport	Naini Saini, Pithoragarh Airport, towards SE direction (40.48 km*)
Nearest Railway Station	Kathgodam Railway Station, District- Nainital, towards SSW direction (approx. 73.94 Km*)
Water body	<ul style="list-style-type: none"> Saryu River 9.08 km in NW direction Pungar River 1.88 km in N direction Kulur Stream 8.24 km in SE direction
Nearest School/ college	<ul style="list-style-type: none"> Government Primary School, Agar-approx. 2.99 km in S direction Government Primary School, Jhakra-approx. 0.94 km in ENE direction Government Primary School, Khantoli-approx. 1.75 km in S direction Government Junior High School, Khantoli-approx. 2.14 km in SE direction

Reserve/ Protected Forest	<ul style="list-style-type: none"> • Huram Reserve Forest, 2.94 km in SE direction • Chaukori Berinag Reserve Forest, 5.82 km in ESE direction • Manjgaon Reserve Forest, 2.37 km in NW direction • Bhandola Reserve Forest, 1.91 km in NNE direction • Letala Reserve Forest, 7.50 km in N direction • Pokhdanda Reserve Forest, 8.11 km in NNW direction • Baisbunga Reserve Forest, 7.79 km in NW direction • Pungar Reserve Forest, 8.42 km in NW direction • Phalyanti Reserve Forest, 8.84 km in W • Gairar Reserve Forest, 5.21 km in W direction • Chhatena Reserve Forest, 9.10 km in WSW direction • Gurna Reserve Forest, 6.67 km in SW direction • Bankot Reserve Forest, 9.42 km in SSW direction • Ratmoli Reserve Forest, 8.63 km in S direction
Nearest Hospital	<ul style="list-style-type: none"> • Banlekh Hospital -approx. 2.59 km in N direction. • Community Health Center, 3.20 km in NNE direction.
Temple	<ul style="list-style-type: none"> • Hanuman Mandir, Bageshwar -approx 4.23 km in NW direction. • Dhaulinaag Temple, 1.23 km in S direction

Table 10.2 Project Salient features

On-line proposal No.	SIA/UK/MIN/78030/2022
File No. allotted by SEIAA, UK	EC-01(16)/2022
Name of Proponent	M/s Dhaulinaag Mines & Minerals
Full correspondence address of proponent	Nayna Vihar, Damuwadhunga Kathgodam, District-Nainital, Uttarakhand

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Area: 3.784 Ha

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Name of Project	Garuwa Sirmoli Soapstone Mining Project		
Name of Village	Garuwa Sirmoli		
Tehsil	Kanda		
District	Bageshwar		
Name of Minor Mineral	Soapstone		
Sanctioned Lease Area (in Ha.)	3.784 ha		
Category of the project	“B1”		
Max & Min mRL within lease area	Max- 1492.45 mRL & 1401.85 mRL		
Pillar Coordinates (Verified by DMO)	Pillar No.	Latitude	Longitude
	1	29°50'52.08"N	79°55'36.76"E
	2	29°50'51.80"N	79°55'33.20"E
	3	29°50'57.80"N	79°55'31.10"E
	4	29°50'55.58"N	79°55'28.44"E
	5	29°50'56.50"N	79°55'27.60"E
	6	29°51'3.14"N	79°55'28.51"E
	7	29°51'3.46"N	79°55'29.43"E
	8	29°51'0.69"N	79°55'32.34"E
	9	29°50'59.77"N	79°55'31.22"E
	10	29°50'59.27"N	79°55'31.86"E
	11	29°50'59.96"N	79°55'33.30"E
	12	29°50'58.54"N	79°55'34.79"E
	13	29°50'55.88"N	79°55'34.19"E
Maximum Proposed Production	15,426 tonnes /annum (in Vth year)		
Sanctioned Period of Mine lease	Maximum 25 years		
Method of Mining	Open Cast Mechanized Method		



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No. of working days	240 days	
Working hours/day	8hrs	
No. of workers	38	
Type of Land	Agriculture land	
Ultimate Depth of Mining	12 m	
Nearest metalled road from site	550 m	
Water Requirement	PURPOSE	REQUIREMENT (KLD)
	Drinking	0.38
	Suppression of dust	5.0
	Plantation	3.8
	Mobile Toilet	0.38
	Total	9.56
Any litigation pending against the project or land in any court	No	
Details of Lease Area in approved DSR	Yes, given in the DSR	
Proposed Project cost	Rs 79.02 lakh	
Proposed EMP budget including the CER Cost as per OM dated 30 Sep 2020	EMP Recurring Cost- 9.10 Lakh CER cost – 6.40 Lakh	
Length and breadth of Haul Road	Length: 500 m, width: 5 m	
No. of Trees to be Planted	1900 plants	

10.2 RESERVES

Method of estimation of reserve

- 1- The cross section area of each section line has been calculated for each category of reserves. The cross sectional area is multiplied by the strike influence to get the volume. The volume is multiplied by the bulk density to get the tonnage in each section line. Geological cross section is enclosed as **Plate No.-5**.
- 2- In order to calculate the mineable reserve the geological map on the 1:1500 scale was prepared and main litho units were marked on the plan to know the surface spread of each unit.
- 3- Bulk density of soapstone has been assumed 2.6 in view of our past experience in and around the area.



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- 4- All the quantities of soapstone up to 200m horizontal extension from exploratory pit & depth 9m from surface have been considered under 111.
- 5- All the quantities of soapstone occurring 3m vertically below the proved mineral reserve has been considered as 121.
- 6- All the quantities of mineral up to depth of 9m from surface with in restricted zone have been considered as 211.
- 7- All quantities of mineral below 3m from 211 have been considered as 222.
- 8- Bulk density of interburden (Magnesite) has been assumed as 2.6 in view of our past experience in the area.
- 9- The occurrence of soapstone has been taken as 40% of the total excavation as per past experience in the area.
- 10- Recovery of interburden (Magnesite) has been taken as 60% of the total excavation as per past experience in this region.
- 11- Based on exploration within this area & mining activities in surrounding regions, it has been revealed that occurrence of soapstone varies 35% to 45%. Therefore on an average occurrence of soapstone has been considered 40% of total excavation.
- 12- Generally small quantities of magnesite interlocked with soapstone that is inseparable so 5% of total recoverable soapstone has been considered as mining losses.
- 13- Besides above assumed parameters in this Mine Plan for First Five year it is assessed during the exploration of this project area by RQP that the soapstone deposit is in tremendous quantity and somewhere wide spread in nature/thick manner without overburden/soil profile.

The summary of mineral reserves is summarized below:

Table 10.3- Summary of Geological Reserve

Mineral Reserve	UNFC Code	Quantity in million Tons	Grade
A. Total Mineral Reserve			
Proved Mineral Reserve	111	2,58,311	Cosmetic paper

Probable Mineral Reserve	121	77,749	Cosmetic paper
B. Total Remaining Resources			
Feasibility mineral Resources	211	21,220	Cosmetic paper
Prefeasibility mineral Resources	222	17,970	Cosmetic paper
Measured mineral Resources	331	-	-
Indicated mineral Resources	332	-	-
Inferred mineral Resources	333	-	-
Reconnaissance mineral Resources	334	-	-
Total (A+B)	-	3,75,250	-

10.3 MINING PROCESS

Briefly describe the existing/proposed method for developing/working the deposit with all design parameters:

(I) Existing Method of mining:

It is fresh application for mining lease & mining operations yet to be commenced

(II) Proposed method of mining:

It will be opencast Mechanized mine. The overburden & interburden shall be removed by means of excavator. The soapstone shall be extracted with the help of excavator as well as manually with the help of hand tools like crow bar, chisels, pickaxe, hammers, and spade. Different grade of soapstone will be stacked separately near the mining faces. Drilling & blasting shall not be required/proposed during the mining operations. The soapstone shall be dressed manually & stacked separately. No further beneficiation shall be undertaken during first five years. The different grade of soapstone will be filled into 50 kg plastic bags & transported the road side by mules.

Table 10.4- Proposed productions in mining plan period – 05 years

YEAR	PIT-I	PIT-II	TOTAL PRODUCTION SOAPSTONE (TONNES)
Ist	8112	2403	10,515
IInd	8500	4594	13,094
IIIrd	7652	5818	13,470
IVth	8533	6075	14,608
Vth	7886	7540	15,426
TOTAL	40,683	26,430	67,113

Total Proposed Production

Maximum Production: 15426 tonnes /annum (in Vth year)

10.4 WATER DEMAND

The water requirement will be around **9.56 KLD**. About 0.38 KLD for domestic and 5.0 KLD will be required for dust suppression. Water for drinking purpose will be supplied from the Uttarakhand Jal Sansthan and naulla's of nearby villages. This water will be supplied by private tankers. For dust suppression and Plantation the water supplied from nearby naulla's and treated water.

Table 10.5- Water Demand

S.NO.	Purpose	Manpower/Area	Water Demand (KLD)	Source
1.	Drinking	Manpower (38) 38*10L =380 lpcd	0.38	Nearby village naulla's
2.	Plantation	1900 trees *2L = 3800L	3.8	Private tanker(Treated Water)

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3.	Dust Suppression	Length= 500m Width= 5m Area= 500x5 =2500m ² 2500*2L =5000 lpcd	5.0	Private Tanker(Treated Water)
4.	Toilet	Manpower (38) 38*10L =380 lpcd	0.38	Nearby village naulla's
Total			9.56	

10.5 BASELINE DATA

This section contains the description of baseline studies of the 10 km radius of the area surrounding Village- Garuwa Sirmoli, Tehsil- Kanda and District- Bageshwar, Uttarakhand. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed.

Environmental data has been collected in relation to proposed mining for:-

- (a) Air
- (b) Noise
- (c) Water
- (d) Soil
- (e) Ecology and Biodiversity
- (f) Socio-economy



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Table 10.6: BASELINE ENVIRONMENTAL STATUS

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring (AAQM) has been carried out at five locations during pre-monsoon season from October to December 2022. The minimum and maximum level of PM _{2.5} recorded within the study area was in the range of 21.5µg/m ³ at AQ-5 to 52.7µg/m ³ at AQ-5 with the 98th percentile 51.69 µg/m ³ at AQ-5. The minimum and maximum level of PM ₁₀ recorded within the study area was in the range of 26.54µg/m ³ at AQ-7 to 75.36µg/m ³ at AQ-7 with the 98th percentile 74.57µg/m ³ at AQ-7. The minimum and maximum concentration of SO ₂ recorded within the study area was in the range of was 2.1µg/m ³ at AQ-1 to 13.4µg/m ³ at AQ-3 with the 98th percentile 12.12µg/m ³ at AQ-8. The minimum and maximum level of NO ₂ recorded within the study area was in the range of was 2.5µg/m ³ at AQ-8 to 20.7µg/m ³ at AQ-2 with the 98th percentile 20.10µg/m ³ at AQ-2. The results thus obtained indicate that the concentrations of PM ₁₀ , PM _{2.5} , SO ₂ and NO ₂ in the Ambient Air are well within the National Ambient Air Quality (NAAQ) standards for Industrial, Residential, Rural and other areas.
Noise Levels	Noise monitoring was carried out at 4 locations. The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the prescribed limits of NAAQS, at all the four locations monitored.
Water Quality	3 Groundwater samples and 2 surface water samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by Indian Standards IS: 10500-2012. From the surface water analysis it is evident that most of the parameters of the samples comply with 'Category C' standards of CPCB Drinking water source with conventional treatment followed by disinfection.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.52 to 7.75, which shows that the soil is alkaline in nature.
Ecology and Biodiversity	There are no Ecologically Sensitive Areas present in the study area

**Traffic
analysis**

From the analysis it can be seen that the LOS is not Likely to change near village

ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

10.6 BIOLOGICAL ENVIRONMENT

FLORA - Flora of the Core Zone

The core zone comprises of private agriculture land, where mining operation is proposed. Few invasive species like *Parthenium hysterosporus*, *lantana camara*, shrubs like *Cannabis sativa* etc. are present. No ecologically sensitive plant species has been reported from core area.

Flora of the Buffer Zone

Buffer zone of the proposed project falls in lesser and Greater Himalaya region. Buffer zone consists of many reserve forests enlisted above, a variety of faunal species are found in the region. Many tree species are planted in the area because of their usefulness, economic and aesthetic values. The tree species observed in the area are, Aam (*Mangifera indica*), Jamun (*Syzygium cumini*), Bail (*Aegle marmelos*), Dakain (*Melia azadirach*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*), Bhimal (*Grewia optiva*) etc. In agricultural waste land and along the road side, growth of shrubs (including invasive species) like *Argemone mexicana*, *Cannabis sativa*, *Cenchrus ciliaris*, *Parthenium hysterosporus*, etc. are very common. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Agricultural Crops

Vegetation pattern in villages and surrounding areas are slightly different and lesser from the rest of the regions of Bageshwar district. The common species grown near villages are mostly edible or useful plants such as *Mangifera indica*, *Azadirachta indica*, *Albizia lebbek*, *Delonix regia*, *Ficus religiosa*, etc.

Fauna

Fauna Reported in Core zone:

During the faunal survey in the area no wildlife corridor or movement of animals was recorded from proposed project area. As far as the reptile community was concerned, Indian cobra, garden gecko and house lizard are recorded from the study area. No established habitats of any mammals or birds are noticed along the banks. No bird's habitats like nesting, breeding and foraging patterns are noticed in the core zone.

Fauna reported in Buffer zone:

Many domesticated mammal species are reported from buffer zone during the field survey. Common domestic animals like Buffalo, cow, goat etc. can be noticed in open grass fields while grazing. Small mammals like Indian palm squirrel (*Funambulus palmarum*) and field mouse (*Apodemus sylvaticus*) are noticed in vicinity of the village. Inquiry from village people regarding wild animals reveals that monkey (*Macaca mulata*), Indian hare (*Lepus nigricollis*), fruit bat (*Pteropus conspicillatus*), mongoose (*Herpestes edwardsii*), jackal (*Canis aureus*), etc. are often seen in the area.

The bird population consists of Common teal (*Anas crecca*), White throated kingfisher (*Halcyon smyrnensis*), Pied kingfisher (*Ceryle rudis*), Red wattled lapwing, House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Common hill Myna (*Gracula religiosa*), Red-rumped Swallow (*Cecropis daurica*), Hoopoe (*Upupa epops ceylonensis*) etc are noticed.

The reptilians species commonly reported are Garden lizard (*Calotes versicolor*), *Eutropis macularia*, rat snakes (*Ptyas mucosus*), Cobra (*Naja naja*) and Banded krait (*Bungarus multicinctus*) etc.

Impact on Biodiversity

Present data have been collected through direct inventory as well as various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre-project biological environmental conditions. There are no endangered species, wildlife sanctuary, wildlife corridors, faunal migratory routes or eco-sensitive area near the

whole study area. Save the flora/fauna around the project area, is one of the basic objective of present project. For this, mine owner agency will plant a good roadside plantation along both side of the mine road.

Plantation shall be carried out out side the lease area over van panchayat land & shall be

Undertaken all along prominent wind direction to arrest the airborne dust particulate matter. The

Tree species to be planted is as below:

Trees: *Prunus persica* (**Peach**), *Boswellia serrata* (**Salai**), *Juglans spp* (**Walnut**) and *Embllica officinalis* (**Amla**), *Mangifera indica* (**Aam**), *Betula utilis D. Don* (**Bhojpatra**), *Myrica esculenta* *Buch* (**Kaaphal**),

Impact on Agriculture

The mine area and the surrounding is all agricultural land. Total area comes under Agricultural area. The mining shall be carried out from lower levels to upper levels through the Formation of benches. During plan period as the mining pit shall reach its maximum economical Depth backfilling shall be commenced to restore maximum original topography of one area. The Backfilled shall again utilize for agriculture purpose.

Impacts on aquatic ecology

Mining activities may result in affecting the riverine ecology by polluting the river water. But in this case, Rivers lies almost 5km or more away from mine site and also nothing is being discharged into the River. Thus, it is recommended that adequate surveillance measures are implemented during project operation phase to ameliorate such impacts.

Mitigation Measures

There is a requirement to establish a stable ecosystem with both ecological and economic returns. Minimization of soil erosion and dust pollution enhances the aesthetic value of the core and the buffer zone. To achieve this, it is planned to increase the area of green cover of plantation and green belts activities. The basic objectives of plantations are as follows:

- Improvement of Soil quality,
- Quick vegetative cover to check soil erosion,
- Improvement in mining site stability,

- Conservation of biological diversity of plants, birds and animals,
- As dust receptor and dust filter, this is likely to be produced during mining.
- If birds are noticed crossing the core zone, they will not be disturbed at all;
- Labors will not be allowed to discards food, plastic etc., which can attract animals/birds near the core site;
- Only low polluting vehicles having PUC will be allowed for carrying mining materials.
- Noise level will be maintained within permissible limit (silent zone-50dB (A) during day time or residential zone 55dB (A)) as per noise pollution (regulation and control), rules, 2000, CPCB norms.

10.7 LAND ENVIRONMENT

The proposed opencast mine will result in change of land use pattern of the mining lease 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. The potential adverse impact of opencast mining is the change in land use pattern. So reclamation of mined out land will be given due importance as a step for land resource management.

(a) Impact on land use & reclamation of mined out areas

The impact on land form or physiography will be land use on the hilly terrain will undergo radical changes due to the open cast mining. During the first five years mining, land will be degraded due to mining & allied activities. At the end of conceptual period, there shall be no mining pits & all the mined-out pit shall be Backfilled/reclaimed to retain its maximum original topography of the area.

(b) Solid waste generation and management

Solid waste is generated at the project site. Below soil cover boulders of weathered magnesite & Dolomitic occurs having average thickness 2.0 m & same is treated as overburden/waste Material. All quantities of waste material to be generated each year shall be dumped with in lease

Area secured with Gravity retaining wall (Gravity retaining wall having width & height 2.0m & 1.0m shall also be erected at the base of backfilled pit at the base & side of dump). All quantities of waste generated during plan period shall be used for backfilling the mined-out pits. The dumps are temporary in nature & all quantities shall be used in premature back filling over mined out pit before commencement of monsoon. After over the monsoon, the waste material shall be rehandled from mining pits & dump on the earmarked dump area. From third year onwards all quantities of waste material shall be used in backfilling.

10.8 AIR ENVIRONMENT

Proposed Soapstone mine where emissions of Sulphur dioxide (SO₂), Oxides of Nitrogen (NO_x) contributed by vehicles movement were considered marginal as branded make and vehicles with PUC certificate will be operated only. Fugitive dust and particulates are major pollutants which will occur 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 at the 10 km radius of study area due to mining activities.

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

- Impact due to wind erosion & road maintenance
- Loading and unloading of mineral and OB, IB
- Transportation on the haul road

Water tankers with spraying arrangement of sprinklers with high efficiency will be used for regular water sprinkling on the haul roads to ensure effective dust suppression. The trucks and tippers are well maintained so that exhaust smoke does not contribute abnormal values of noxious gases and un-burnt hydrocarbons.

Control of Fugitive Emissions

- Use of Personal Protection Equipments (PPE) like dust masks, ear plugs etc. by the mine workers.
- No Blasting will be done.
- Regular water sprinkling on haul roads & loading points will be carried out.
- Development of green belt/plantation around the lease boundary, roads, dumps etc.

- Ambient Air Quality Monitoring will be conducted on regularly basis to assess the quality of ambient air.

Emissions due to mineral handling during mining operation are not much and restricted to the lease area only. Air pollution is caused mainly due to dust generation added with gaseous emission from transportation activities along with mining operation like evacuation, loading, haulage etc. Proper mitigation measures will be practiced during mining activities to control air pollution load below the prescribed limits. The same are as follows:

Prevention and control of Gaseous Pollution

- In mining activities, the sources of gaseous emissions would be through truck movements
- Proper maintenance of vehicles improves combustion process & makes reduction in the pollution. Good maintenance and monitoring of fuel and oil will not allow significant addition in the gaseous emission.
- All the vehicles used will have PUC certificate.
- Taxi mode of vehicles carrying mined out material while loading and unloading will not be allowed.
- Vehicles carrying mineral will be covered with tarpaulin sheet. This will prevent dust emission.

10.9 WATER ENVIRONMENT

Damage in the water body, depends on its assimilative capacity. To find out assimilative capacity of receiving water body, water samples were collected from different groundwater and surface water sources. The study indicates that assimilative capacity of the River water bodies still exists, but effective measures shall be taken to check water pollution. To find out the effect on ground water an extensive hydro-geological study has been conducted and from the study it can be safely concluded that there is no noticeable adverse effect on surrounding ground water resource due to mining. The mining activity does not require water. Mining of soapstone does not have any significant impact on the water quality and parameters as the mining does not intercept with the ground water level. In this project, it is not proposed to divert or truncate any stream. No proposal

is envisaged for pumping of water from the river. There will not be any adverse impact on surface hydrology and ground water regime due to this project. The water collected in the mine during monsoon season will be extracted with the help of pump & will be drained in nearby water body with the help of tankers approach road and area demarcated by gram panchayat. Thus, the project activities shall not have any adverse effect on the physical components of the environment and therefore may not have any effect on the recharge of ground waters or affect the water quality.

(a) Impact on Water Resources& Surface Water Resources:

The topography of the area will not be largely changed in view of the proposed concurrent reclamation. No surface water body exists and passes through the lease area. During the mining activity period, there is a possibility of mixing of freshly disturbed material with the rain water. To take care of such events, retaining walls have been provided along the backfilled pits and along the soil and inter-burden dumps. Before the commencement of rain all the mining pits shall be backfilled so that rain water does not accumulate in the mining pits. Rain water will be channelized along the slopes it shall not carry suspension to natural streams.

10.10 NOISE ENVIRONMENT

Anticipated impacts and evaluation

Noise generated at the mine is due to semi-mechanized mining operations, mechanized loading and truck transportation activities. The noise generated by the mining activity dissipates within the mine. However, pronounced effect of above noise levels is felt only near the active working area. The impact of noise on the villages is negligible as the villages are far located from the mine workings. Since there is no involvement of machinery, the impact of noise levels will be minimal.

(a) Noise Abatement and Control

In this mine the noise level will be up to tolerable limit (70 dB (A)) and the noise level can be reduced by:

- Proper maintenance, oiling and greasing of transport vehicles at regular intervals will

be done to reduce the generation of noise.

- Adequate silencers will be provided in all the diesel engines.
- Plantation along the sides of approach roads, around office building and mine area will be done to minimize the propagation of noise.
- Personal Protective Equipments (PPE) like earmuffs/earplugs will be provided to all operators and employees working near mining machineries or at higher noise zone.
- Periodical noise level monitoring will be done.

The noise level in the working environment are compared with the standards prescribed by Occupational Safety and Health Administration (OSHA-USA) which has been adopted and enforced by the Govt. of India through model rules framed under Factories Act, 1980 and CPCB 2000 norms. The off-site receptors are not significantly affected as they are located far away from the mine site. But some disturbances due to vehicle movement cannot be avoided.

Plantation will be done along the barrier zone and roadsides etc. which will more or less dampen the off-site noise level.

10.11 TRAFFIC ANALYSIS

From the above analysis it can be seen that the V/C ratio for mines w.r.t Village Road is likely to change from 0.164 to 0.227 with LOS being no Change with 'B' as per classification LOS stated above & also for NH 309/A V/C ratio changed from 0.173 to 0.1814 with LOS being same "A" which is 'Excellent' as per classification LOS stated above. The minerals excavated will be loaded directly into trucks and transported to the concerned market.

10.12 SOCIO-ECONOMIC ENVIRONMENT

The implementation of the Soapstone mining project will throw opportunities to local people for both direct and indirect employment. Since the quarries will be leased out to successful allottees, soapstone mining operation in the state will get legalized and it will fetch income to the state exchequer. The project will also provide impetus to industrialization of the area. With the implementation of the proposed mining project the occupational pattern of the people in the area will change making more people engaged in industrial and business activities rather in agriculture. Thus there will be a gradual shifting of population from agriculture to mining and industry. Further, the

mining and industrial activities in the area may lead to rapid increase in population and thereby urbanization. Due to urbanization of the area, employment opportunities will further increase.

10.13 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Proper environmental management plan is proposed for (Soapstone) Mine project to mitigate the impact during the mining operation.

- No overburden or loose sediments will be kept in the vicinity of the working benches.
- The possibility of the project activity contributing to the pollution of watercourses of the region or to the ground water regime is so less that this does not significantly constitute an area of concern.
- Construction of well-compacted roads.
- Regular water spraying on haul roads and waste dumps by tankers.
- Provision of dust collectors for the drilling & crusher machines
- Personal Protective Equipment (PPE) like earmuffs/earplugs, dust masks, helmets, safety boots will be provided to all operators and employees working near mining machineries or at higher noise zone.
- Plantation of wide leaf trees, creepers, tall grasses around quarry sites, waste dumps, road and other surrounding barren zones.
- Proper and regular maintenance of vehicles, compressors and jack hammers.
- Care should be taken that noise produced during vehicles movement for carrying soapstone and boulder is within the permissible noise level.
- Provision of Green Belt (thick foliage) along the lease boundary and road.
- Strict observance of the provisions of Acts, Rules and Regulations in respect of safety both by management and the workers.
- Proper planning and designing of work in order to reduce the risk of hazards.
- Specific instructions and supervisions of working where danger due to fall of side (overhanging, undercutting of bench, fall of objects from higher benches/places is apprehended).

- Training of work persons and the officials.
- Since the haul road will be of considerable length, due importance will be given in the construction of road. The width of road will be maintained more than thrice the width of the vehicle. A code of traffic rules will be implemented.
- A code of practices for tipping in stock piles/dumping of overburden at dump yard and loading point will be implemented.
- In respect of contract work, safety code for contractors and workers will be implemented.
- They will be allowed to work under strict supervision of statutory person/officials only after they will impart training at vocational training centers. All personal protective equipment will be supplied to them.
- Competent persons like fitters, mechanics will be imparted with special attention to project impact.
- Provision of pit safety committee meeting to discuss the safety of the mines and the persons employed.
- Celebration of annual mines safety week and environmental week in order to develop safety awareness amongst employees.
- Pre joining medical checkup shall be done and regular health check-up in 6 monthly intervals is planned for the employees.
- Care will be taken that no cooking, or burning of woods will be allowed in the adjoining area.
- If some causality or injury to animal occurs, it should be informed to forest department and proper treatment should be given.
- Corridor movement of wild mammals (If exists) should be avoided.
- Provision of rest shelters for mine workers with amenities like drinking water etc.
- Periodical Medical Examination (PME) of all workers by a medical Officer
- First Aid facility is provided at the mine site.
- Close surveillance of the factors in working environment and work practices which may affect environment and worker's health.

- Working of mine as per approved mining plan and environmental plans.

10.14 ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

Environmental Management Plan serves no purpose if it is not implemented with true spirit. Some loopholes in the EMP can also be detected afterwards when it is implanted and monitored. Thus, an implementation and monitoring programme has to be prepared.

The major attributes of environment are not confined to the mining site alone. Implementation of proposed control measures and monitoring programme has an implication on the surrounding area as well as for the region. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented within the mining area relating to the following specific areas:

- a Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
- b Collection of soil samples at strategic locations once in every year and analysis thereof with regard to deleterious constituents, if any.
- c The effectiveness of drainage system depends upon proper cleaning of all drains provided in the surrounding of mine area. Any blockage due to siltation or loose material will be checked at least once in a month.
- d Measurement of water level fluctuations in the nearby water bodies.
- e Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done in every quarter of the year.
- f Plantation/afforestation as should be done as per program. Regular watering of plant and fencing to protect them from cattle/goats has to be provided. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

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 State- Uttarakhand
 Area: 3.784 Ha

Mine management will be in regular touch with local surrounding villages to update the various developmental schemes made by them. They will also consider any immediate requirement, which could be taken care of in near future.

Mine management will be in regular touch with State Pollution Control Board and Indian Bureau of Mines and send them annual progress report. Any new regulations considered by State/Central Pollution Control Board for the industry will be taken care of.

Table 10.7: Budget allotted for Environmental Management Plan

EMP BREAK UP			
Environment Management Plan (EMP)		Capital Costs in (Rs.)	Recurring Cost
A	Haulage Road Repair & Maintenance Filling, Leveling and widening of the road up to width of 5m. Setting & Fixing of Cut Stone on the leveled road.	Annual 500 m (L) x 5 m (W)=2500m ²	1,00,000
B	Water Sprinkling on Haulage Road for Dust Suppression	Assuming Rs.2000/day for 240 days of working Tanker Cost: Rs. 1000/Tanker Tanker Capacity: 5000 liter, No. of Tankers required: 2	2,40,000
C	Environmental Monitoring & Compliances.	Half Yearly Monitoring of Environmental Parameters viz. Air, water, Noise & Soil. Half Yearly Submission of Compliances.	1,00,000
D	Plantation along the road side & post plantation care	3,80,000 Plantation@200/sapling (1900 sapling) .	1,50,000
E	Corporate Social Responsibility	3,30,000	

F	Biogas Plant (Construction and maintenance)	2,00,000/- (Construction cost)	50,000 (waste collection, transportation, fodder for mules)
Total		9,10,000 Lakh	Rs.6,40,000 (Lakhs)

10.15 MONITORING SCHEDULE AND PARAMETERS

Table 10.8: Monitoring Schedule and Parameters

S.No.	Description of Parameters	Schedule of Monitoring
1	Air Quality	24 hourly samples twice a week in each season except monsoon
2	Water Quality (Surface & Groundwater)	Twice a year
3	Soil Quality	Once in a year in project area
4	Noise Level	Twice a year for first two years & then once a year
5	Socio-economic Condition	Once in 3 years
6	Plantation monitoring	Once in a season

10.16 BENEFIT OF MINING

➤ PHYSICAL BENIFITS

Improvement in the Physical Infrastructure

The opening of the proposed project will enhance the following physical infrastructure facilities in the adjoining areas.

- Road Transport:** There will be improved road communication due to the proposed project and maintenance will also be done time to time.
- Market:** Generating useful economic resource for construction. Excavated mineral will provide a good market opportunity.

- c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the Lease boundary or along the road sides or near the civic amenities.
- a. **Creation of community assets** (infrastructure) like provision for drinking water, construction of school buildings, village roads/ linked roads, dispensary & health center, community center, market place etc, as a part of corporate social responsibility.

The impact on the civic amenities will be substantial after the commencement of mining activities. The basic requirement of the community needs will be strengthened by extending health care, educational facilities developed in the township to the community, providing drinking water to the villages, building/strengthening of existing roads in the area. The proponent will initiate the above amenities either by providing or by improving the facilities in the area, which will help in uplifting the living standards of local communities. 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.

➤ **SOCIAL BENEFITS**

- 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.
 - There will be significant change in the socio-economic scenario of the area.
 - The proposed project will enhance the prospects of employment. Recruitment for the unskilled and semiskilled workers for the proposed project will be from the nearby villages.
 - The development of the basic amenities viz. roads, transportation, electricity, drinking water, proper sanitation, educational institutions, medical facilities, entertainment, etc. will be developed as far as possible.
 - Overall, the proposed project will change living standards of the people and improve the socio-economic conditions of the area.
- a) **Increase in Employment** Potential due to the project activity. Employment opportunities will increase both directly as well indirectly.

- b) **Contribution to the Exchequer** as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.
- c) **Increased Health related activities:** Healthcare promotional activities will be undertaken. Pre-placement & and Periodic medical check-up will be done, which will lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp sports will be arranged.
- d) **Educational attainments:** educational activities will be promoted by the lessee. Awareness program will be arranged covering basic issues related to primary level education, environment, health and hygiene etc.
- e) **Strengthening of existing community** facilities through the Community Development Programme.

ENVIRONMENTAL BENEFITS

➤ Enhancement Of Green Cover

Plantation/afforestation will be done as per program 1900 plants will be planted along the approach road and area demarcated by Gram Panchayat/Local Administrative body with consultation & permission of concerned authority within 5km from lease boundary along with provision for maintenance for 5 years. Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people will also be involved. The management will provide free saplings of fruit and other trees, etc. to local during rain for plantation. This will increase the consciousness in workers and near-by villagers for greenery. Fruit trees can contribute towards their financial gains.

10.17 CORPORATE SOCIAL RESPONSIBILITY

Table 10.8 Budget allotted for Corporate Environmental Responsibility

S no.	Activity	Quantification	Capital cost
1	Provide drinking water facility in surrounding villages and schools by	-	1,00,000

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 State- Uttarakhand
 Area: 3.784 Ha

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	hand pump installation.		
2	Solar lamp distribution& Solar street light installation	-	1,00,000
3	Free distribution of medicines, health check-up camps nearby village	-	80,000
	Distribution of school bags & Books in nearby Primary Schools		50,000
Total			3,30,000

10.18 CONCLUSIONS

- 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
- 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.



Cognizance Research India Pvt Ltd
 NABET-QCI Accredited Consultant



Vijesh Lohani

CHAPTER – 11

DISCLOSURE OF CONSULTANT

Project: Garuwa Sirmoli Soapstone Mining Project
Proponent: M/s Dhaulinaag Mines & Minerals
Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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DISCLOSURE OF CONSULTANTS

ENGAGED

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Vijish Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
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Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
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Vaishali Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
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Village: Garuwa Sirmoli
Tehsil- Kanda & District-Bageshwar,
State- Uttarakhand
Area: 3.784 Ha

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CONSULTANTS ENGAGED

The consultant engaged for the preparation of the EIA/EMP of the project is M/s Cognizance Research India Private Ltd. The information about the company with address is as follows:

Basic Information about the Consultant Engaged is as follows stated below:

Name of the Consultant	Cognizance Research India Private Ltd.
Address	Suite- B 02 H-61Sector –63, Noida, U.P
Credentials	Accredited by QCI/NABET

Personnel involved in the preparation of EIA/EMP report are stated below:

Sr. No.	Name	EC/FAE	Details
01	Mr. Ankur Sharma	EC	EIA Coordinator (Mining of minerals opencast).
02	Mr. Nimish Singhvi	FAE	AP, SHW & GEOLOGY
03	Mr. Bhavesh Jha	FAE	SE
04	Ms. Rahul Kumar	FAE	AQ
05	Mr. Ankur Sharma	FAE	WP
05	Ms. Pooja Mamgain	FAE	EB
06	Mr. P M Jain	FAE	RH, NV
07	Abhishek Kumar Singh	FAE	LU
08	Vidhya Bhushan Trivedi	FAE	HG
09	Anjali Haribhau Chachane	FAE	SC

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Jaishankar Lohani

Project: Garuwa Sirmoli Soapstone Mining Project
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Accreditation Certificate of the Consultant Engaged:

 **QUALITY COUNCIL OF INDIA**
Creating an Ecosystem for Quality

 **National Accreditation Board for Education and Training** 

Certificate of Accreditation


Cognizance Research India Private Limited
B-02, H-61, Sec 63, Noida, Uttar Pradesh

The organization is accredited as Category-A under the QCI-NABET Scheme for Accreditation of EIA Consultant Organization, Version 3: for preparing EIA-EMP reports in the following Sectors –

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals including opencast/ underground mining	1	1 (a) (i)	A
2	River Valley projects	3	1 (c)	B
3	Mineral beneficiation	7	2 (b)	A
4	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	21	5 (f)	B
5	Building and construction projects	38	8 (a)	B
6	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in SAAC minutes dated December 2, 2022 and Supplementary Assessment dated Dec 23, 2022 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/23/2644 dated Jan 18, 2023. The accreditation needs to be renewed before the expiry date by Cognizance Research India Private Limited following due process of assessment.


Sr. Director, NABET
Dated: January 18, 2023

Certificate No.
NABET/EIA/1922/SA 0186

Valid up to
September 10, 2023

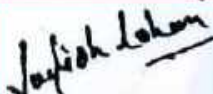
For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

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Area: 3.784 Ha

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Cognizance Research India Pvt Ltd
NABET-QCI Accredited Consultant



Vijish Lohani

ANNEXURE I

TOR

राज्य स्तर पर्यावरण समाघात निर्धारण
प्राधिकरण, उत्तराखण्ड, "गौरादेवी पर्यावरण
भवन, तृतीय तल, 46-बी, आई.टी.
पार्क, सहस्त्रधारा रोड, देहरादून"
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय,
भारत सरकार, नई दिल्ली द्वारा गठित)
दूरभाष: 0135-2976159
ईमेल: seiaa.seac.uk@gmail.com



State Level Environment Impact
Assessment Authority, "Gauradevi
Paryavaran Bhawan, Third Floor, 46-B
I.T. Park, Sahasradhara Road,
Dehradun"
(Constituted by Ministry of
Environment, Forests and Climate
Change Government of India.)
Phone No-0135-2976159
Email- seiaa.seac.uk@gmail.com

Letter No. 219/SEIAA

Dated- 22 February, 2023

To,

M/s Dhaulinaag Mines and Mineral by Shri Jagdish Chandra Lohani (Partner),
Village- Garuwa Sirmoli, Tehsil- Kanda, District-Bageshwar.

Sub- Regarding Terms of Reference (ToR) for Extraction of Soapstone at Village- Garuwa Sirmoli, Tehsil- Kanda, District-Bageshwar. (3.784 Ha.)

Kindly take reference of your submitted vide proposal no SIA/UK/MIN/78030/2022 on dated 9th June, 2022 regarding above proposal. The SEAC in its 3rd meeting held on dated 16th February, 2023 examined the proposal. The SEIAA in its 3rd meeting held on dated 21st February, 2023 after thorough discussion and deliberation conveyed that SEIAA desires EIA report of this proposal after due public consultation conducted by Uttarakhand Pollution Control Board. The terms of reference (TOR) for the EIA report is being out lined below:-

1(a): STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR NON-COAL MINING PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

- 1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
- 2) A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
- 3) All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee. The above reports should also match with the latest District Survey Report (DSR) notification dated 25th July, 2018. **Data obtained from this DSR should be incorporated in the EIA Report for Impact Identification, Interpretation, Prediction, Carrying Capacity and Mitigation.**
- 4) All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/ toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
- 5) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
- 6) Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
- 7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.
- 8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.
- 9) The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.
- 10) Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features

should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

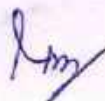
- 11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.
- 12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.
- 13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.
- 14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.
- 15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
- 16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.
- 17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.
- 18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled- I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.
- 19) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).
- 20) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.
- 21) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data with geo tagged photographs of sampling location on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM₁₀, particularly for free silica, should be given.
- 22) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. **Monitoring should be at four places minimum.** The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
- 23) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.
- 24) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.



- 25) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.
- 26) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.
- 27) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.
- 28) Details of any stream, seasonal or otherwise, passing through the lease area and modification/diversion proposed, if any, and the impact of the same on the hydrology should be brought out.
- 29) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.
- 30) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.
- 31) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.
- 32) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.
- 33) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.
- 34) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.
- 35) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
- 36) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
- 37) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
- 38) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.
- 39) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.
- 40) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.
- 41) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.
- 42) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

43) Besides the above, the below mentioned general points are also to be followed:-

- a) Executive Summary of the EIA/EMP Report
- b) All documents to be properly referenced with index and continuous page numbering.
- c) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.
- d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.
- e) Where the documents provided are in a language other than English, an English translation should be provided.

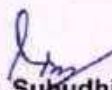


- f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.
- g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.
- h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.
- i) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.
- j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.
- k) All pages of technical documents/EIA/EMP should be signed by the consultant and project proponent both.
- l) The lease area, its address and production per annum should match with as mentioned in DSR and LOI. In case there is any difference classification/amendment letter from competent authorities shall be submitted.
- m) Plan for using the mine void for productive use in consultation with local administration and gram panchayat.
- n) In case project proponent intends to temporarily mine out materials outside the mine lease area than NOC from competent authority for doing so should be submitted and details of such area and associated environmental impacts should be included in EIA EMP report this should be clearly mentioned during public hearing.
- o) Road network to be used by the project should be clearly shown on survey of India top sheet in 1:20,000 scale. In case road network involves forest road, permission should be obtained from forest department and a copy of the same should be submitted at the time of appraisal of EIA-EMP report.
- p) Project proponent should submit action plan for carrying out plantation at least 1000 plants/ha of lease area. In this case PP, should prepare a plan duly approved either by Forest department of Horticulture department for planting either on government land or community land within periphery of 5 Kms from the boundary of lease area along with provision for maintenance for 5 years. Survival of plants below Uttarakhand Forest Departments survival rate will be treated as violation of EC condition.
- q) In view of the agricultural land proposed under the mining lease area, the project proponent needs to submit the cost benefit analysis composing the current agricultural production and annual turnover vis-à-vis the mineral cost and beneficiaries.

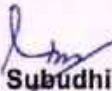
Note: 1) The study area shall comprise of radial distance of 10 KM from the project site and the study period is three months. The impact on each of the above parameter as a result of mining shall be assessed through appropriate modelling and prediction methods considering base line data.

2) District Survey Report should be submitted as per the latest notification issued by MoEF&CC.

Hence you are kindly requested to kindly submit EIA report for further necessary action.


(S.P. Subudhi)
Secretary,
SEIAA, Uttarakhand

Copy to:- Member Secretary, Uttarakhand Pollution Control Board, Gaura Devi Paryavaran Bhavan, 46-B, IT Park, Sahasthradara Road, Dehradun for necessary action.


S.P. Subudhi)
Secretary,
SEIAA, Uttarakhand

ANNEXURE II

Letter of intent (LOI)

J.D.(M)
दी 10/10/2021

SR
C. J. Singh



उत्तराखण्ड शासन
औद्योगिक विकास (खनन) अनुभाग-1
संख्या: 1449 / VII-A-1 / 2021 / 1(34) / 21
देहरादून, दिनांक: 01 अक्टूबर, 2021

कार्यालय ज्ञाप
आशय पत्र (Letter of Intent)

जनपद बागेश्वर, तहसील काण्डा के ग्राम गणुवासिरमोली के क्षेत्रान्तर्गत कुल 8.136 है० भूमि में खनिज सोपस्टोन का खनन पट्टा चाहने हेतु मै० धौलीनाग माइंस एण्ड मिनरल, नयना विहार, दमुवाडुंगा, कैनाल रोड, कॉल टैक्स, काठगोदाम, हल्द्वानी, जिला नैनीताल भागीदार श्री माया प्रसाद जोशी पुत्र श्री हरीश चन्द्र जोशी, निवासी ग्राम तुनेरा (कोटगांव), पो० धिंधारतोला, तहसील व जनपद बागेश्वर के आवेदन पत्र दिनांक 26.08.2019 द्वारा उपलब्ध कराये गये प्रस्ताव के क्रम में इस आशय पत्र (Letter of Intent) के माध्यम से राज्य सरकार मै० धौलीनाग माइंस एण्ड मिनरल, नयना विहार, दमुवाडुंगा, कैनाल रोड, कॉल टैक्स, काठगोदाम, हल्द्वानी, जिला नैनीताल भागीदार 1. श्री माया प्रसाद जोशी पुत्र श्री हरीश चन्द्र जोशी, निवासी ग्राम तुनेरा (कोटगांव), पो० धिंधारतोला, तहसील व जनपद बागेश्वर 2. श्री जगदीश चन्द्र लोहनी पुत्र श्री हरीश चन्द्र लोहनी, निवासी ग्राम गाडगांव, तहसील व जनपद बागेश्वर 3. श्री दीप चन्द्र पन्त पुत्र श्री पूरण चन्द्र पन्त, ग्राम गणुवा सिरमोली, पो० डपटी, तहसील काण्डा, जनपद बागेश्वर हाल निवासी नयना विहार, कैनाल रोड, कॉल टैक्स, काठगोदाम, तहसील हल्द्वानी, जनपद नैनीताल एवं 4. श्री नवीन कुमार पुत्र श्री जीत सिंह, ग्राम जलमानी, पो० स्याँकोट, तहसील व जनपद बागेश्वर के पक्ष में जनपद बागेश्वर, तहसील काण्डा के ग्राम गणुवासिरमोली के क्षेत्रान्तर्गत कुल 3.937 है० भूमि में उत्तराखण्ड गौण खनिज नीति, 2015 (समय-समय पर यथासंशोधित) के प्रावधानानुसार खनिज सोपस्टोन का 25 वर्ष की अवधि हेतु खनन पट्टा स्वीकृत करने की मंशा रखती है। आवेदक यदि उक्त खनन पट्टा लेने हेतु सहमत हों तो निम्नलिखित शर्तों का अनुपालन पत्र प्राप्ति के छः माह में प्रस्तुत करें, जिससे खनन पट्टे की औपचारिक स्वीकृति जारी की जा सके :-

1. आवेदकगण द्वारा उत्तराखण्ड गौण खनिज नीति, 2015 (समय-समय पर यथासंशोधित) के नियमों/प्रतिबन्धों पर लिखित सहमति पत्र।
2. (i) राजस्व विभाग की आख्यानसार खनन पट्टा हेतु प्रस्तावित 3.937 है० में से श्रेणी 1 (क) संक्रमणीय भूमिधर की 3.337 है०, श्रेणी 4(क) संक्रमणीय पट्टेदार की 0.036 है०, सार्वजनिक उपयोग की श्रेणी 10(1) गूल की 0.006 है०, नौला की 0.001 है०, सैली की 0.118 है०, श्रेणी 10(2) रास्ता की 0.072 है० कुल 0.197 है०, राज्य सरकार की श्रेणी 7 (क) सरकारी पट्टेदार की भूमि 0.015 है०, श्रेणी 9(3) ड बंजर काविल आवाद की 0.352 है० कुल 0.367 है० है। सार्वजनिक उपयोग उपयोग की कुल 0.197 है० भूमि में खनन कार्य निषिद्ध किया जायेगा तथा राज्य सरकार की भूमि श्रेणी 0.367 है०, भूमि में पट्टाधारक को खनन कार्य करने की अनुमति प्रदान की जाती है तो लीज रेंट का निर्धारण किया जायेगा।
- (ii) प्रभागीय वनाधिकारी के पत्र संख्या-1537/9-2, दिनांक 14.11.2019, पत्र संख्या 172/9-2, दिनांक 08.07.2021 के अनुसार प्रश्नगत खनन क्षेत्र में चीड़ के 04 वृक्ष, बाँज के 09 वृक्ष, फल्गु के 06 वृक्ष, मेहल के 03 वृक्ष, कुकाट के 03 वृक्ष कुल 25 वृक्षों को कोई क्षति न पहुँचाने का उल्लेख किया गया है। उक्त वृक्षों की सुरक्षा हेतु सीमांकन के समय उचित दूरी चिह्नकित की जानी होगी।
- (iii) Features संबंधी खसरा मानचित्र संलग्न नहीं है, जिसे सीमांकन के समय चिह्नकित किया जाना होगा।

प्रस्तावित क्षेत्र का सीमाबन्धन भूतत्व एवं खनिकर्म इकाई के अधिकारियों द्वारा राजस्व विभाग तथा प्रभागीय वनाधिकारी, बागेश्वर वन प्रभाग के प्रतिनिधि के द्वारा संयुक्त रूप से किया जायेगा। सीमाबन्धन के समय यदि क्षेत्र का कोई भाग आसन्न जनिक प्रांगण का हिस्सा हो तो उसे छोड़ दिया जायेगा।

SANDEEP KUMAR
RQ/UKGMU/No.013/Year-2019

SR



3. उत्तराखण्ड गौण खनिज नीति, 2015 के प्रस्तर 3(दो)(5) के अनुसार आवेदक द्वारा खनन सौजन्य संबंधित खान अधिकारी/उप निदेशक(खनन) के समक्ष ₹ 20,000/- का धनराशि निर्धारित लेखाशीर्षक में ट्रेजरी चालान के माध्यम से जमा कराने के उपरान्त चालान की प्रती के साथ प्रस्तुत की जायेगी।
4. आवेदकगण द्वारा उत्तराखण्ड गौण खनिज नीति, 2015 (समय-समय पर यथासंशोधित) के प्रस्तर 3 (ग्यारह) के द्वारा किये गये संशोधन के अनुसार बैंक गारंटी ₹ 1.00 लाख मैन्युअल माईनिंग एवं ₹ 2.00 लाख मशीनीकृत माईनिंग हेतु निदेशक के पक्ष में प्रस्तुत करनी होगी।
5. उत्तराखण्ड गौण खनिज नीति, 2015 के प्रस्तर-7 के अनुसार आवेदक को खनन पट्टे में पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार की अधिसूचना का0आ0 2601 (अ) दिनांक 07 अक्टूबर 2014 के क्रम में जारी शासनादेश संख्या-1621/VII-1/212-ख/2014, दिनांक 17 दिसम्बर 2014 के अनुसार पर्यावरणीय अनुमति प्राप्त किया जाना आवश्यक होगा।
6. प्रस्तावित स्थल से सोपस्टोन के अतिरिक्त अन्य खनिजों के निकलने की दशा में बिना सक्षम स्तर से अनुमति प्राप्त किये अन्य खनिजों का दोहन/निकासी न किये जाने की व्यवस्था की गयी है, का उल्लेख किया गया है। निदेशक, भूतत्व एवं खनिकर्म इकाई, उत्तराखण्ड के पत्र संख्या-1917/मु0ख0/खनन/141/भू0खनि0ई0/2020-21, दिनांक 07 नवम्बर 2020 के द्वारा खनिज सोपस्टोन के आवेदित क्षेत्रों में उपलब्ध मैग्नेसाइट, लाईम स्टोन की उपलब्धता के संबंध में Limit का निर्धारण किये जाने हेतु कन्ट्रोलर जनरल, खान मंत्रालय, भारतीय खान ब्यूरो, नागपुर से मार्ग-दर्शन प्राप्त किये जाने हेतु पत्र प्रेषित किया गया है, जिसके संबंध में मार्ग-दर्शन अपेक्षित है। आवेदक के पक्ष खनन पट्टा स्वीकृति के उपरान्त खनन कार्य के दौरान निकलने वाले अन्य खनिज यथा मुख्य खनिज को एकत्रित कर रखेगा, जिसका निस्तारण भारतीय खान ब्यूरो, नागपुर से प्राप्त होने वाले दिशा-निर्देशानुसार के अनुसार निस्तारण किया जाना होगा।
आवेदित क्षेत्रान्तर्गत खनिज सोपस्टोन की गुणवत्ता के निर्धारण नहीं हुआ है जिसके निर्धारण के लिये 01 एक्सप्लोरेटरी होल प्रतिवर्ष के मानक के अनुसार करते हुये गुणवत्ता का निर्धारण किया जाना आवश्यक होगा।
7. आवेदित क्षेत्र मोटर मार्ग से 150 मीटर की दूरी पर स्थित होने का उल्लेख किया गया है, जिसे खसरा मानचित्र पर दर्शाया जाना आवश्यक होगा।
8. आवेदित क्षेत्रान्तर्गत वाहनों के आवागमन हेतु पहुंच मार्ग के संबंध में उल्लिखित नहीं किया गया है, जिसके संबंध में जिलाधिकारी, बागेश्वर द्वारा आख्या उपलब्ध करायी जायेगी।
9. आवेदक को उत्तराखण्ड पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण बोर्ड, उत्तराखण्ड से CTE प्राप्त करना आवश्यक होगा।
10. उत्तराखण्ड गौण खनिज नीति, 2015 के प्रस्तर-8 के अनुसार आवेदक को प्रतिभूति धनराशि ₹ 10,000/- निदेशक, भूतत्व एवं खनिकर्म इकाई के पक्ष में बन्धक करना होगा।
11. मै0 धौलीनाग माइंस एण्ड मिनरल फर्म का जी0एस0टी0न0 प्रस्तुत किया जाना होगा।
12. आवेदक को खनन एवं राजकीय ढकाया न होने के संबंध में फर्म एवं फर्म के भागीदारों के संबंध में जिलाधिकारी द्वारा निर्धारित प्रपत्र में अद्यतन अदेयता प्रमाण-पत्र तथा वरिष्ठ प्रमाण-पत्र प्रस्तुत करना होगा।
13. आवेदक फर्म एवं फर्म के भागीदारों का आयकर/आयकर विवरणों जमा करा दिये जाने के सम्बन्ध में आयकर अधिकारी का अद्यतन प्रमाण-पत्र प्रस्तुत करना होगा। यदि आयकर देय नहीं हो तो इस आशय का शपथ-पत्र प्रस्तुत करना होगा।
14. आवेदक खनन कार्य के दौरान स्थल में उपलब्ध सार्वजनिक सम्पत्ति, आवासीय भवन, सार्वजनिक स्थल, खाल, गूल एवं धारा आदि को हानि नहीं पहुंचायेगा। हानि पहुंचाने की स्थिति में पट्टाधारक स्वयं जिम्मेदार होगा।
15. आवेदकगण द्वारा सक्षम अधिकारी द्वारा प्रदत्त निवास प्रमाण-पत्र प्रस्तुत करना होगा।

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SANDEEP KUMAR
RGP/CMU/No.013/Year-2019



संख्या: 1444 (1)/VII-A-1/2021 तददिनांकित।

प्रतिनिधि: निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित :-

1. निदेशक, भूतत्व एवं खनिकर्म इकाई, उत्तराखण्ड, देहरादून को-उगके उपर्युक्त पत्र के सन्दर्भ में सूचनार्थ एवं निम्न निर्देशों के साथ कि उत्तराखण्ड गौण खनिज नीति, 2015 (समय-समय पर यथासंशोधित) के प्रावधानानुसार खनन पट्टा हेतु प्रस्ताव शासन को उपलब्ध कराने का कष्ट करें :-
(क) इस आदेश द्वारा स्वीकृत क्षेत्र का सीमाबन्धन प्रत्येक दशा में इस आदेश की दिनांक से 60 दिवस में करा लिया जाय ताकि समयान्तर्गत पट्टाधारक द्वारा पट्टाविलेख का निष्पादन कराया जा सके।
(ख) खनन पट्टा क्षेत्र के सीमाबन्धन की सूचना मय सीमाबन्धन रिपोर्ट, मानचित्र आदि के सीमाबन्धन पूर्ण किये जाने की दिनांक से 10 दिवस में शासन को प्रेषित कर दी जाये।
(ग) सीमाबन्धन रिपोर्ट में यह प्रमाण पत्र अवश्य दिया जाये कि खनन पट्टे पर स्वीकृत क्षेत्र में सम्मिलित वन भूमि के अलावा कोई अन्य वन भूमि खनन पट्टा हेतु सीमाबन्धित क्षेत्र में सम्मिलित नहीं की गई है तथा सीमाबन्धित क्षेत्र की परिधि से कम से कम 100 मीटर की दूरी पर है।
2. जिलाधिकारी, बागेश्वर।
3. मै० धौलीनाग माइंस एण्ड मिनरल, नयना विहार, दमुवाडुंगा, कैनाल रोड, कॉल टैक्स काठगोदाम, हल्द्वानी, जिला नैनीताल भागीदार 1. श्री माया प्रसाद जोशी पुत्र श्री हरीश चन्द्र जोशी, निवासी ग्राम तुनेरा (कोटगांव), पो० घिघारतोला, तहसील व जनपद बागेश्वर 2. श्री जगदीश चन्द्र लोहनी पुत्र श्री हरीश चन्द्र लोहनी, निवासी ग्राम गांडगांव, तहसील व जनपद बागेश्वर, 3. श्री दीप चन्द्र पन्त पुत्र श्री पूरन चन्द्र पन्त, ग्राम गणुवा सिरमोली, पो० ढपटी, तहसील काण्डा, जनपद बागेश्वर हाल निवासी नयना विहार, कैनाल रोड कॉल टैक्स, काठगोदाम, तहसील हल्द्वानी, जनपद नैनीताल एवं 4. श्री नवीन कुमार पुत्र श्री जीत सिंह, ग्राम जलमानी, पो० स्याँकोट, तहसील व जनपद बागेश्वर।
4. गार्ड फाईल।

आज्ञा से

(दिनेश सिंह भण्डारी)

अनु सचिव

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019

ANNEXURE III

Approved Mining Plan

MINING PLAN

WITH

PROGRESSIVE MINE CLOSURE PLAN

(Submitted under Rule 34(4) of Uttarakhand Minor Mineral Rules 2001)

APPROVED

अनुमोदित

SOAPSTONE MINING PROJECT

VILLAGE- GARUWA SIRMOLI, TEHSIL- KANDA

DISTRICT- BAGESHWAR (UTTARAKHAND)

(TOTAL AREA: 3.784 HA.)

PLAN PERIOD: 5 YEAR

APPLICANT

M/s Dhaulinaag Mines and Mineral

Address: Nayna Vihar, Damuwdhunga

Khatgodam, District- Nainital

(Uttarakhand-263139)



2/6/2022
निदेशक
भूतत्व एवं खनिकर्म विभाग
उत्तराखण्ड, देहरादून

PREPARED BY

GEO MINING & ENVIRO SERVICES

SANDEEP CHOUDHARY (RQP)

REGISTRATION NO: RQP/UKGMU/NO.013/YEAR-2019

VALID UPTO-15.07.2024

Mo. No. 8126253120

APPROVED
अनुमोदित

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KOP

Sanjeev Kumar

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SANDEEP KUMAR
RQP/UnionMU/No.013/Year-2019

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अनुमोदित

Garuwa Sirmoli Soapstone Mine Project,
Village- Garuwa Sirmoli , Tehsil- Kanda District- Bageshwar

INTRODUCTION



S. No.	Particulars	Details देहरादून
1	Lease execution & Lease period	State Government give Letter of Intent, Village-Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar, vide L.O.I. No. 1449/VII-A-1/2021/1(34)/21 dated 01.10.2021., for a period of 25 years. In LOI mining lease area has been given 3.937 ha. But in demarcation lease area reduce to 3.784 ha. Copy of L.O.I is enclosed as Annexure No.1.
2	Transfer details and date of transfer	Not Applicable
3	Present document its lapse period & proposed period.	Five Year
4	Last approved documents & its validity	Not Applicable
5	Status of Environmental clearance	Lessee shall be obtain Environmental Clearance after approval of Mining Plan.

VILLAGE	DISTRICT	STATE	AREA (HA.)	MINERAL
GARUWA SIRMOLI	BAGESHWAR	UTTARAKHAND	3.784 HA.	SOAPSTONE

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1.0 GENERAL

Garuwa Sirmoli Soapstone Mine Project
Village- Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar

CHAPTER-1



1.1	Name of the applicant	M/s Dhaulnag Mines And Mineral Partners: 1. Shri Maya Prasad Joshi S/o Shri Harish Chandra Joshi 2. Shri Jagdish Chandra Joshi S/o Shri Harish Chandra Joshi 3. Shri Deep Chandra Pant S/o Shri Puran Chandra Pant 4. Shri Naveen Kumar S/o Shri Jeet Singh
	Address	Nayna Vihar, Damuwdhunga Khatgodam
	District	Nainital
	State	Uttarakhand
	Pin Code	263640
	Phone	-
1.2	Status of the applicant	Private Individual
1.3	Mineral (s) which is/are included in the prospecting license (For fresh grant)	Soapstone
1.4	Mineral (s) which is/are included in the letter of intent/ lease deed	Soapstone
1.5	Mineral (s) which is the applicant/lessee intends to mine	Soapstone
1.5	Name of the RQP preparing the mining plan	Sandeep Kumar
	Address	H.no. 500/14, Skauntalam Awas Vikas Colony, Circular Road Muzaffar Nagar (UP)
	Phone	8126253120
	Email:-	sjayla733@gmail.com
	Fax	-
	Registration No.	RQP/UKGMU/NO013/Year2019
	Valid up to	16/07/2019 & 15/07/2024
1.6	Name of the prospecting agency	The baseline data is collected from various reports, proponent, as well as detailed prospecting of the area is carried by the RQP.

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Garuwa Sirmoli Soapstone Mine Project
Village-Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar



CHAPTER-2

2.1) LIST OF ANNEXURE

S.No.	TITLE	Annexure No.
1	Copy of Letter of Intent (LoI)	1
2	Demarcations Letters	2
3	Demarcation Report-District Task Force	3
4	Mine Plan Approval Fee as <i>Chalan copy</i> , Rs. 20,000	4
5	Demarcation chalan	5
6	Farm Certificate	6
7	Partnership deed	7
8	NOC From Land Owners	8
9	Copy of ID Proof	9
10	Copy of Khasra Map	10
11	Copy of Khasra Details	11
12	Copy of RQP Certificate	12
13	Certificate by RQP	13
14	Authorization letter by the applicant	14

2.2) LIST OF PLATES

S.No.	NAME OF PLATES	Plate No.	Scale
1.0	Location Plan	1	Not in scale
2.0	Key Plan	2	Not in scale
3.0	Surface/ Geological Plan	3	1:1500
4.0	Geological Section	4	1:1000
5.0	Pit Position at the end of 1 st Year	5	1:1500
6.0	Pit Position at the end of 2 nd Year	6	1:1500
7.0	Pit Position at the end of 3 rd Year	7	1:1500
8.0	Pit Position at the end of 4 th Year	8	1:1500
9.0	Pit Position at the end of 5 th Year	9	1:1500
10.0	Mine Closure Plan	10	1:1500

KSP

Sanjeev Kumar

SANDEEP KUMAR
RQP/UK/MU/No.013/Year-2019

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Garuwa Sirmoli Soapstone Mine Project
Village- Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar

CHAPTER-3



3.0 LOCATION AND ACCESSIBILITY

3.1 Lease Details (Fresh Application)

(a)	Name of the Mine	Garuwa Sirmoli Soapstone Mining Project
	Lat/Long of the boundary points	29°50'52.08"N 79°55'36.76"E (Pillar No. 1, details about other pillars given below column)
	Date of grant of lease	Fresh Application
	Period/Expiry date	25 years
	Name of the lease holder/applicant	M/S Dhaulinaag Mines And Mineral
	Postal Address	Village- Nayna Vihar, Damuwdhunga Khatgodam, District-Nainital, Uttarakhand
(b)	Details of applied/Area	Location Map is attached as Plate No. 1 Non-Forest Agriculture land
	Total lease area/applied area	3.784 Ha.
	District and State	Bageshwar, Uttarakhand
	Tehsil	Kanda
	Village	Garuwa Sirmoli
	Felling Series etc.	None
	Area (hectares)	3.784 Ha. (Khasra Map & Khasra details, attached as Annexure-7 & Annexure -8)
	Whether the area is in forest (please specify whether protected, reserved etc.)	No, area does not fall under forest area.

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Garuwa Sirmoli Soapstone Mine Project
Village- Garuwa Sirmoli . Tehsil- Kanda District- Bageshwar

Ownership/Occupancy		Private Individual	
GEOGRAPHICAL COORDINATES	Pillar No.	Latitude	Longitude
	1	29°50'52.08"N	79°55'26.76"E
	2	29°50'51.80"N	79°55'33.20"E
	3	29°50'57.80"N	79°55'31.10"E
	4	29°50'55.58"N	79°55'28.44"E
	5	29°50'56.50"N	79°55'27.60"E
	6	29°51'3.14"N	79°55'28.51"E
	7	29°51'3.46"N	79°55'29.43"E
	8	29°51'0.69"N	79°55'32.34"E
	9	29°50'59.77"N	79°55'31.22"E
	10	29°50'59.27"N	79°55'31.86"E
	11	29°50'59.96"N	79°55'33.30"E
	12	29°50'58.54"N	79°55'34.79"E
	13	29°50'55.88"N	79°55'34.19"E
(c)	Location Map	Location Map is attached as Plate No. 1	

3.2 GENERAL

(a)	Mineral being worked	Soapstone
(b)	Period of mining Lease	State Govt. willing to grant mining lease for twenty five (25) Years to applicant
(c)	Category of land use	Agricultural land (Non forest land)
(d)	Elevation Range From Highest to Lowest	1492.45 m to 1401.85 m

APPROVED
अनुमोदित

Garuwa Sirmoli Soapstone Mining Project
Village- Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar



3.3 ACCESSIBILITY

The area can also be approached from Bageshwar via Bageshwar- Pithoragarh road is about 20 km from Bageshwar and lease area further connected by metalled road about 4 km from the Bageshwar- Pithoragarh road

Soapstone from applied area shall be transported through mules as well as manually and stacked at road site. Soapstone from road site is transported to Haldwani. Haldwani is 180 km. from Bageshwar. The location plan is shown in **Plate No.1** and key plan showing 5km buffer zone is shown in **Plate No. 2**.

APPROVED
अनुमोदित

Garuwa Sirmoli Soapstone Mine Project
Village- Garuwa Sirmoli, Tehsil- Kanda, District- Bageshwar

CHAPTER-4

4.0 DETAILS OF APPROVED MINING PLAN/SCHEME OF MINING (If any)

Date and reference of earlier approved Mining Plan/Scheme of Mining

It is fresh grant case of mining lease & Mining Plan is yet to be approved.

Details of last modifications if any (for the previous approved period) of approved MP/SOM, indicating date of approval, reason for modification

Not applicable.

Give review of earlier approved proposal (if any) in respect of exploration, excavation reclamation etc.

Not applicable.

Give status of compliance of violations pointed out by IBM/District Magistrate/Deptt Geology and mining office or other specific person appointed by Government or Director Geology & Mining.

Not applicable.

Indicate and give details of any suspension/closure/prohibitory order issued by any Government agency under any rule or court of law

Not applicable.

In case the Mining Plan/SOM is submitted for approval of modification, specify reason and justification for modification

Not applicable.

CHAPTER-5



5.0 GEOLOGY & RESERVES:

5.1 Physiography: - (The aspects to be looked into are topography of terrain, drainage pattern, and vegetation, climate, and rainfall data of the area applied/mining lease area)

The lease area comprises of terraced agricultural fields showing undulating topography. The slope of area is gentle (9 to 15°) is towards south to north direction. The higher levels are found towards the eastern side of the area near boundary pillar 1 whereas the lowest horizons within the area are found near boundary pillar 6. The highest & lowest levels found in the area are of 1492.45 mRL to 1401.85 mRL respectively. The slopes in hill area vary from moderate to gentle. The drainage pattern of the area is dendrites in pattern & in first & second order. The area is infertile in nature.

The physiography of the area shows on Surface/Geological Plan of the area, surface and geological plan enclosed as Plate No-3.

Climate Condition: -

Climatically the area falls in temperate zones with pleasant summer & extreme cold winters. The area receives moderate snowfalls during winters between January & February. The maximum temperature goes up to 35° . While the average minimum temperature goes up to 2° to 4° in the months of January & February.

Temperature, Relative Humidity and Wind: -

January is the coldest month with mean maximum temperature of 10°C , the mean minimum temperature being about 2°C . Temperature drops down to 6°C during January and February in the northern part of the district. June is the warmest month with the mean maximum and the mean minimum temperatures of 25°C and 15°C respectively. The maximum temperature recorded in the district was 43°C (May 2003) Whereas the minimum temperature recorded was 4°C (January 2003).

The relative Humidity increase rapidly with the onset of monsoon and reaches at about 80% during July to September. The driest part of the year is the pre-monsoon period, when the humidity is as low as 30% in the afternoons. Skies are heavily clouded during the monsoon months and for short spells when the district is affected by Western Disturbances. Two broad wind pattern are observed in the district viz north easterly to easterly (May to September) and south easterly to westerly (October and March).



Rainfall: -

Month the rainfall, about 75% of the annual value, occurs during monsoon months of June to September. July is the rainiest followed by August. In September, depressions from Bay of Bengal occasionally reach Uttarakhand and affect the weather of Bageshwar District also. The phenomenon may cause heavy rains. With the withdrawal of monsoon in September, the intensity of rainfall rapidly decreases. The decrease continues till November, which is a practically rainless month. Winter precipitation is associated with the passage of the western Disturbances and is in the form of snowfall over higher elevations. The monthly and annual average rainfall data of District Bageshwar in year 2012, 2014, 2015, 2016 is 1697mm, 1157.38mm, 1241.52mm and 1346.34mm respectively. Maximum rainfall occurred in July 2016 is 1684.05mm.

5.2 GEOLOGY:

(Surface geological map with contour interval maximum of 10 meter on a scale of 1:2000/1:1000 may be examined for features detailed below)

Regional Geology:-

District Bageshwar is mainly represented by the rocks of Lesser Himalaya and Central Himalaya. The geological set up is very complex due to the repeated tectonic disturbances caused by different orogenic cycles. Valdiya (1980) carried out extensive geological and structural mapping in this area.

The rock units exposed in various parts of Bageshwar district comprise current-bedded quartzite with associated volcanics, mica-talc schist, limestone, conglomerate, slate, quartzite, granodiorite, augen gneiss, and migmatite and granite gneiss. Many areas in the northern part of the district are yet to be mapped by conventional field methods due to inaccessibility and permanent snow cover. However a group of regionally metamorphosed rocks known as the Central Crystallines are exposed in this area. The Central Crystallines of the Central Himalayan Zone occur as thrust sheets over the metasedimentary and sedimentary rocks of Lesser Himalayan Zone in varied tectonic settings. Major rock types of Central Crystallines are migmatites, psammitic and mica gneiss, calc gneiss, quartzite, marble, mica schist and amphibolites. Granites of different ages ranging from Paleoproterozoic to Mesozoic-Tertiary intrude the Central Crystallines. Major parts of Bageshwar district falls under the geotectonic zone known as the Lesser Himalaya. Rock types in the Lesser Himalayan Zone include sedimentaries, metasedimentaries and plutonic igneous



rocks. The various rock units have suffered multiple phases of deformation and metamorphism in major parts of the district.

Geological framework of Almora-Bageshwar regions is so wide where that region is divided in different litho-tectonic units. The geology of the area consists of three Stratigraphic and tectonic units, namely (a) The Central Crystalline, (b) The Baijnath Crystalline and (c) The Garhwal Group. In the north the meta-sedimentary rocks of the Garhwal group have been thrust over by the Central Crystalline and the contact is known as the Main Central thrust. In the south the Kausani thrust separates the Garhwal group from the physically overlying Baijnath Crystalline. In the central part of the Bageshwar region there are rocks of Garhwal group is found to expose.

On the basis of previous works by Heim and Gansser (1939) and Gansser (1964) gave an account of different lithological units and structural trends, with regional interpretations in the Kumaun Himalaya. Rocks of the central part of the Bageshwar region is remarked as a part of "The Calc zone of Tejam". The first geological map of the area was published by Misra and Banerjee (1968). Subsequently it was revised by Misra and Bhattacharya (1972), after that work has been carried out by A. Ahmad (GSI, 1975), A.R. Bhattacharya (1979) and besides those workers K.S. Valdiya (1980) and A.K. Sinha (1981) also gave their contribution in the account of the Geology of the region.

The area belongs to a part of Calc Zone of Tejam. The Stratigraphic sequence of the region as per monumental work (Geology of Lesser Himalaya, 1980) of Prof. K.S. Valdia, given as below-
Soil

Berinag Quartzite

-----Unconformity-----

Gangolihat Dolomite

Dolomite and Dolomitic limestone with Algal structures, Magnesite with minor talc/Talcosse phyllite and dolomitic intercalations.

-----Unconformity-----

Sor Slates

Shales, Slates and Phyllites

The above Stratigraphic sequence as observed in this region is considered to be an inverted one. Soapstone pockets/lenses occurs within carbonates of Gangolihat Dolomite.



(I) Disposition of all lithological units with clear nomenclature and their descriptions

Local Geology:-

Locally the area only shows the part of carbonates of Gangolihat Dolomite sequence. The local stratigraphy shows that the mineralized zone lies between upper & lower carbonates as below-

Upper Carbonates: Magnesite sporadic dolomite

Middle Talcose phyllite: Talc in pockets

Lower Carbonates: Dolomite & dolomitic intercalations

As per UNFC, the deposit is lenticular of all dimensions. UNFC category IV

Alluvial Cover:

A thin layer of brownish color of soil exists in the whole area. The thickness of soil varied between 1.10 to 1.30m.

Soapstone bearing with Magnesite:

The soapstone mineral in Kumaon Himalaya is an alteration products magnesium bearing minerals. soapstone occurs as pocket type massive and sometimes confined to the upper part of the magnesium bearing zones. The mineral body occurs in irregular shape & size. The foliation plane of soapstone trending about 330°N to 340°N. amount of dip varies 30 degree to 35 degree. direction varies 50°N to 55°N.

(II) Contact of Litho Units/rock types traced inferred:-

The lease area is terrace hill agriculture land with soil cover. No contacts of litho units/rock types been observed on the ground level.

(III) Attitudes like strike and dip available in adequate numbers:-

Applied area is mostly covered with the soil cover.

(IV) Structural features such as joints, folds, faults and their attitudes:-

No structural features observed within the lease area.

(V) Delineation of mineralized/ore zones with definite demarcation of observed and inferred:-

Mineralization zone delineate with the help of pits and existing mining surrounding the area.

5.3 Details of prospecting/exploration already carried out:-

The area was explored with help of three exploratory pits up to depth of 4m to 9m and soapstone was encountered in all trial pits. The exploration was carried out in scattered manner as per the consent of land owners. Therefore, exploration was not carried out in grid pattern and in proper spacing. The details of exploration already undertaken within the area are given below:-

Exploratory Pit Points	Length (M)	Width (M)	Thickness	Lithology	Status	Location
EP-1	22	11	0-1.20m 1.20-9m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1070 to N-1081 and E-1213 to E-1068
EP-2	24	10	0-1.20 1.20-9.5m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1208 to N-1218 and E-1175 to E-1199
EP-3	25	12	0-1.20 1.20-8.6m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1260 to N-1272 and E-1074 to E-1099
EP-4	24	12	0-1.20 1.20-8m	-Soil Cover -Soapstone bearing with low grade magnesite	Backfilled	Between the Local coordinate N-1362 to N-1374 and E-1088 to E-1112

5.4 Exploration proposed to be carried out (in case adequate total reserves is not established for the tenure of lease)

During next five years, the unexplored area shall be explored with three trial pits having dimension 5m x 5m x 5m to ascertain the continuity and grade of soapstone. The year wise exploration program is given below:-

Year	No. of trial pits	Location
Five Year	PT1	In between the local coordinates N 1090 to N 1095 & E 1230 to E 1235
	PT2	In between the local coordinates N 1230 to N 1235 & E 1178 to E 1182
	PT3	In between the local coordinates N 1300 to N 1305 & E 1082 to E 1087



5.5 Reserve/Resource Estimation:

The geological reserves have been estimated as per UNFC in all the three axis is as below

Economic Axis (E-1):

- 1- Due to mining in surrounding area, the mineral is good grade & having no problem in selling in the market. Mineral shall be transported manually up to road side & loaded in to trucks. NOC from individual land owners have been obtained. Extraction & sale has been confirmed or there are reasonable expectations that all such approvals will be obtained within a reasonable time frame. Economic viability is not affected by short term adverse market conditions provided that longer term forecasts remain positive.
On this basis economic viability of the deposit has been established & mineral is economically viable. Therefore economic axis has been considered as E-1.

- 2- General exploration laterally as well as in depth by way of pitting.
- 3- Prospecting report has been prepared under rule 16 of MCR1960.
- 4- Specific end use grade of reserve established. The reserves of soapstone with in lease area are cosmetic, paper & detergent grade.
- 5- The land use data of nearby area is available. The applied lease area is totally agriculture land & after mining it shall be backfilled, leveled & ready use for agriculture.

Prefeasibility axis (F-2):

This is small semi mechanized mine. The prefeasibility study has been carried out for this area & is considered to be prefeasibility status. Therefore prefeasibility axis under UNFC for the deposit is F=2

1.Geology: Local Geology, mineralogy & geometry of soapstone deposit with in lease area established during prospecting operations. The identification of ore body carried out & only soapstone was formed occur within the lease area.

2.Mining: the mining will be worked out by semi-mechanized method. The production & development plan prepared & appended. The estimation of manpower has been carried out.

3.Environment: Base line data on environment & land use data etc has been generated.

4. Processing: No processing is proposed.

5.Infrastructure & Services: Site services such as rest shelter, first aid room, drinking water facilities etc will be provided in compliance of Mine Act-1952 & Mine Rules 1955. Construction activities are proposed, to be commenced very soon.

6.Costing: Capital cost & operating cost has been evaluated based on comparable mining operations as appended in prefeasibility.



7. Marketing: the soapstone of the area is proposed the supply to various industries like ceramic, paper, cosmetics etc.

8. Economic viability: the mineral is economically viable.

9. Other Factors: statutory provisions relating to land has been complied while layout, mining & taxation etc would be comply during the course of mining.

Geological Axis:

- G-1 1. Mapping on the scale of 1:1500 on GI proved category has been marked.
2. Geo chemical survey: Sampling from out crops carried out.

1- Geological Survey:

- 1- Mapping in the scale of 1:1500 & bench marks carried out & shown in surface geological plan. Extensive pitting has been done & nature of deposition of soapstone has been shown on geological plan & section.
 - 2- Linking of map with cadastral map carried out & latitude & longitude of corner pillar taken.
 - 3- Assessment of lithology carried out based on the exposures in the pit of soapstone. structure & surface mineralization study & mapped during prospecting period.
- 2- Geochemical survey: Detailed sampling from pits.
- 3- Geophysical survey: Geophysical survey was carried on the basis of exposure and outcrops. The mineralization zone delineated.
- 4- Technological: Extensive pitting carried throughout the lease area. Depth of pits varies 4m to 9m.

5.6 Estimation Mineral Reserve:

The UNFC consists of a three dimensional system i.e. three axes: Geological Assessment, Feasibility Assessment and Economic viability. The process of geological assessment is generally conducted in stages of increasing details. The typical successive stages of geological investigation i.e. reconnaissance, prospecting, general exploration and detailed exploration, generate resource data with a clearly defined degrees of geological assurance. These four stages are therefore used as geological assessment categories in the classification. Feasibility assessment studies form an essential part of the process of assessing a mining project. The typical successive stages of feasibility assessment i.e. geological study as initial stage followed by prefeasibility study and feasibility study/mining report are well defined. The degree of economic viability (economic or sub economic) is assessed in the course of prefeasibility and feasibility studies. Prefeasibility study provides a preliminary assessment with a lower level of accuracy



than that of a feasibility study, by which economic viability is assessed in detail. It is a three digit code based system, the economic viability axis representing the first digit, the feasibility axis the second digit and the geologic axis the third digit. The three categories of economic viability have codes 1, 2 and 3 in decreasing order, similarly the three categories of feasibility study have also codes 1, 2 and 3 while the four stages of geological assessment are represented by 4 codes i.e. 1 (detailed exploration), 2 (general exploration), 3 (prospecting) and 4 (reconnaissance). Thus the highest category of resources under UNFC system will have the code (111) and lowest category the code (334). The various terms used in this classification and their definitions are as follows:

1. Total Mineral Resource

- A concentration (or occurrence) of material of intrinsic economic interest.
 - Reasonable prospects for eventual economic extraction.
 - Location, grade, quantity, geological characteristic known, estimated or interpreted from specific geological evidence and knowledge.
- (i) Measured Mineral Resource (331)
–That part of mineral resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence i.e. based on detailed exploration.
- (ii) Indicated Mineral Resource (332)
–Tonnage, densities, shape, physical characteristic, grade and mineral content can be estimated with reasonable level of confidence based on exploration, sampling and testing information, location of borehole, pits etc. too widely spaced.
- (iii) Inferred Mineral Resource (333)
–Tonnage, grade and mineral content can be estimated with low level of confidence. Inferred from geological evidence.

2. Mineral Reserve

–Economically mineable part of measured and/or indicated mineral resource.

- (i) Proved Mineral Reserves (111)
–Economically mineable part of Measured Mineral Resource.
- (ii) Probable Mineral Reserves (121 & 122)



-Economically mineable part of indicated or in some cases a measured mineral resource.

3. Reconnaissance Mineral Resource (334)

-Estimates based on regional geological studies and mapping, airborne and indirect Methods, preliminary field inspections as well as geological inference and extrapolation.

4. Prefeasibility Mineral Resource (221 and 222)

-That part of an indicated and in some circumstances measured mineral resource that has been shown by prefeasibility study to be not economically mineable.

-Possibly economically viable subject to changes in technological, economic, environmental and/or other relevant condition.

5. Feasibility Mineral Resource (211)

-That part of measured mineral resource, which after feasibility study has been found to be economically not mineable.

-Possibly economically viable subject to changes in technological, economic, environmental and/or other relevant condition.

5.7 Parameters of Estimation:

- 1- The cross section area of each section line has been calculated for each category of reserves. The cross sectional area is multiplied by the strike influence to get the volume. The volume is multiplied by the bulk density to get the tonnage in each section line. Geological cross section is enclosed as Plate No.-5.
- 2- In order to calculate the mineable reserve the geological map on the 1:1500 scale was prepared and main litho units were marked on the plan to know the surface spread of each unit.
- 3- Bulk density of soapstone has been assumed 2.6 in view of our past experience in and around the area.
- 4- All the quantities of soapstone up to 200m horizontal extension from exploratory pit & depth 9m from surface have been considered under 111.
- 5- All the quantities of soapstone occurring 3m vertically below the proved mineral reserve has been considered as 121.



- 6- All the quantities of mineral up to depth of 9m from surface with in restricted zone have been considered as 211.
- 7- All quantities of mineral below 3m from 211 have been considered as 222.
- 8- Bulk density of interburden (Magnesite) has been assumed as 2.6 g/cm³ (our past experience in the area).
- 9- The occurrence of soapstone has been taken as 40% of the total excavation as per past experience in the area.
- 10- Recovery of interburden (Magnesite) has been taken as 60% of the total excavation as per past experience in this region.
- 11- Based on exploration within this area & mining activities in surrounding regions, it has been revealed that occurrence of soapstone varies 35% to 45%. Therefore on an average occurrence of soapstone has been considered 40% of total excavation.
- 12- Generally small quantities of magnesite interlocked with soapstone that is inseparable so 5% of total recoverable soapstone has been considered as mining losses.
- 13- Besides above assumed parameters in this Mine Plan for First Five year it is assessed during the exploration of this project area by RQP that the soapstone deposit is in tremendous quantity and somewhere wide spread in nature/thick manner without overburden/soil profile.

BENCH PARAMETERS

Height of the Bench- 3m
Width of the Bench-3m
Slope of the Bench- 70°
Overall pit Slope - 45°

RESERVE ESTIMATION

PROVED MINERAL RESOURCES (111)				
Section Line	Area m.sq. (111)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			111	111
1-1'	630	60	37800	37346
2-2'	1332	70	93240	92121
3-3'	1278	70	89460	88386
4-4'	630	65	40950	40458
Total	3870		2,61,450	2,58,311

PROBABLE MINERAL RESOURCES (121)				
Section Line	Area m.sq. (121)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			121	121
1-1'	160	60	9600	8985
2-2'	414	70	28980	28632
3-3'	402	70	28140	27802
4-4'	192	65	12480	12330
Total	1168		79,200	77,749

FEASIBILITY MINERAL RESOURCES (211)				
Section Line	Area m.sq. (211)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			211	211
1-1'	80	60	4800	4742
2-2'	86	70	6020	5947
3-3'	78	70	5460	5394
4-4'	80	65	5200	5137
Total	324		21,480	21,220

PREFEASIBILITY MINERAL RESOURCES (222)				
Section Line	Area m.sq. (222)	Strike Influence (m)	Volume (cum)	Recoverable Reserves (Tonnes)
			222	222
1-1'	72	60	4320	4268

2-2'	66	70	4620	4564
3-3'	69	70	4830	4772
4-4'	68	65	4420	4366
Total	275		18,190	17,970



GEOLOGICAL RESERVES:

Mineral Reserve	UNFC Code	Quantity in million Tons	Grade
A. Total Mineral Reserve			
Proved Mineral Reserve	111	2,58,311	Cosmetic paper
Probable Mineral Reserve	121	77,749	Cosmetic paper
B. Total Remaining Resources			
Feasibility mineral Resources	211	21,220	Cosmetic paper
Prefeasibility mineral Resources	222	17,970	Cosmetic paper
Measured mineral Resources	331	-	-
Indicated mineral Resources	332	-	-
Inferred mineral Resources	333	-	-
Reconnaissance mineral Resources	334	-	-
Total (A+B)	-	3,75,250	-

GEOLOGY OF TALC/SOAPSTONE-

Talc is a hydrous magnesium silicate and is commonly known with trade name Soapstone. It has chemical composition $3\text{Mg}_3\text{Si}_2\text{O}_{10} \cdot \text{H}_2\text{O}$ containing theoretically, 63.36 % - SiO_2 , 31.89 % - MgO and 4.75 % - H_2O as pure mineral. Though, in nature chemically pure talc is very rare and usually associated with numerous other mineral like Serpentine, Chlorite, Tremolite, Anthophyllite, Diophyllite, Diopside, Quartz, Calcite, Dolomite and Magnesite.

It is very soft mineral with hardness 1 on mohs' scale having greasy or soapy feel. Usually foliated, finely granular, fibrous, compact and blocky in nature, talc occurs in cryptocrystalline form. The colour of the talc is almost milky white and sometimes grayish, bluish to greenish white. The specific gravity of talc ranges from 2.5 to 2.8.

The physical and chemical properties of Talc such as its smoothness, good luster and shine, high slip and lubricating properties, low moisture content, high oil absorption, chemical inertness, high dielectric strength, good retention for filler purposes, high specific heat, whiteness, low shrinkage etc. make it extremely versatile important industrial mineral. It is mostly used in the pulverized form in the industries like: soap, paper, paint, ceramic, cosmetic, pharmaceutical, insecticide,

pesticide, plastic, roofing, rubber, leather, textile, refractory, insulator, tile, addition in animal food stuff, petroleum etc. Other use for commercial tale include cereal (Rice, Maize and Barley) polishing, bleaching agents, floor wax, water filtration, joint fillers and grouts, shoe polish, welding rod coatings, printing inks toilet preparation, odour absorption from food, foundry, source of magnesium in plant food, lens polishing etc. Along with these uses, it is a primary ingredient in talcum powder and other cosmetics.

Talc deposits always result from the transformation of existing rocks under hydrothermal activity. Through this process, the components (MgO , SiO_2 , H_2O) required for forming the parent rock in to talc are brought by the hydrothermal water. The size and geometry of the final deposit depend up on the size and nature of the parent rock, and the intensity and scale of the phenomenon. The geological context required for such a transformation to occur is known as a low to medium temperature and pressure metamorphism.

Talc is one of the abundant and economically proven mineral resources of Uttarakhand. Occurrences of talc bands, lenses, veins and pockets are known in magnesite, dolomite and chloritic talc schist in different parts of district Bageswar, Pithoragarh, Chamoli and adjoining localities.

CHAPTER-6

6.0 MINING



6.1 OPEN CAST MINING:

- (i) **Existing Method of Mining:** It is fresh application for mining lease & mining operations yet to be commenced.
- (ii) **Proposed Method of Mining:** It will be opencast Mechanized mine. The overburden & interburden shall be removed by means of excavator. The soapstone shall be extracted with the help of excavator as well as manually with the help of hand tools like crow bar, chisels, pickaxe, hammers, and spade. Different grade of soapstone will be stacked separately near the mining faces. Drilling & blasting shall not be required/proposed during the mining operations. The soapstone shall be dressed manually & stacked separately. No further beneficiation shall be undertaken during first five years. The different grade of soapstone will be filled into 50 kg plastic bags & transported the road side by mules.

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

- Mining shall be carried out in two pits.
- It will be opencast mechanized method.
- Average thickness of soil has been considered as 1.20 m. & it shall be stacked separately.
- Top soil, overburden & interburden shall be removed by means of excavators.
- Height & width of benches shall be kept 3m and 3m.
- Face slope of benches shall be 70° with 45° overall pit slope.
- Backfilling will be undertaken after winning the soapstone up to full economical depth. The interburden and top soil will be temporarily dump separately towards the slope of working pit and shall be used for backfilling from third year onwards. Interburden shall be filled into mined out pit and later on thin soil shall be carped over it to restore maximum original topography of the area.
- Generally small quantities of magnesite interlocked with soapstone that is inseparable in nature so 5% of total recoverable soapstone has been considered as mining losses.



(iii) **Last five year production target & achievement:**

It is fresh application case of mining lease & mining operations yet to be commenced.

(iv) **PROPOSED 5 YEARS PRODUCTION TARGET:-**

FIRST YEAR

PIT-I

The Production will be achieved through the opening and advancement of benches 1427m RL to 1424mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FIRST YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1430-1427	1483	3	5649	1780	3389	5581
1427-1424	854	3	2562	432	1537	2531
TOTAL			8211	2212	4926	8112

PIT-II

The Production will be achieved through the opening and advancement of benches 1448 m RL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FIRST YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1451-1448	811	3	2433	974	1459	2403
TOTAL			2433	974	1459	2403



SECOND YEAR

PIT-I

The Production will be achieved through the opening and advancement of benches 1427m RL to 1421m RL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

SECOND YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1427-1424	1428	3	4284	972	2570	4232
1424-1421	1440	3	4320	-	2592	4268
TOTAL			8604	972	5162	8500

PIT-II

The Production will be achieved through the opening and advancement of benches 1448m RL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

SECOND YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1448-1445	1550	3	4650	1210	2790	4594
TOTAL			4650	1210	2790	4594



THIRD YEAR

PIT-I

The Production will be achieved through the opening and advancement of benches 1421m RL to 1418mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

THIRD YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1424-1421	1185	3	3555	950	2133	3512
1421-1418	1380	3	4140	120	2484	4140
TOTAL			7695	1070	4617	7652

PIT-II

The Production will be achieved through the opening and advancement of benches 1442mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

THIRD YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1445-1442	1963	3	5889	614	3533	5818
TOTAL			5889	614	3533	5818



FOURTH YEAR

PIT-I

The Production will be achieved through the opening and advancement of benches 1418m RL to 1415mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FOURTH YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1421-1418	1159	3	3477	615	2086	3435
1418-1415	1720	3	5160	205	3096	5098
TOTAL			8637	820	5182	8533

PIT-II

The Production will be achieved through the opening and advancement of benches 1442m RL to 1439mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FOURTH YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1445-1442	810	3	2430	1080	1458	2400
1442-1439	1240	3	3720	-	2232	3675
TOTAL			6150	1080	3690	6075



FIFTH YEAR

PIT-I

The Production will be achieved through the opening and advancement of benches 1415mRL to 1409mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FIFTH YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top Soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1418-1415	430	3	1290	454	774	1274
1415-1412	1491	3	4473	483	2683	4419
1412-1409	740	3	2220	-	1332	2193
TOTAL			7983	937	4789	7886

PIT-II

The Production will be achieved through the opening and advancement of benches 1439mRL to 1436 mRL.

The bench-wise demonstrated reserves, excavation of soapstone, saleable quantities of soapstone and balance demonstrated reserve at the end of the year is given below:-

FIFTH YEAR						
Bench level (mRL)	Bench Area (m2)	Bench height	Volume (cum)	Top soil (cum)	Interburden (cum)	Soapstone (Tonnes)
1442-1439	1520	3	4560	492	2736	4505
1439-1436	1024	3	3072	-	1843	3035
TOTAL			7632	492	4579	7540

YEAR WISE PROPOSED PRODUCTION DETAILS

YEAR	PIT-I	PIT-II	TOTAL PRODUCTION SOAPSTONE (TONNES)
Ist	8112	2403	10,515
IInd	8500	4594	13,094
IIIrd	7652	5818	13,470
IVth	8533	6075	14,608
Vth	7886	7540	15,426
TOTAL	40,683	26,430	67,113

6.2 PLANS AND SECTIONS:-

Year wise plans and pit sections are shown in PLATE NO. 5 TO 9.

6.3 Drilling & Blasting:-

Soapstone is soft mineral, its hardness has been estimated as 1 as per as Moh's hardness scale, which can be mined easily therefore, there is no need of drilling and blasting for soapstone mining.

6.4 Mine Drainage:-

- Minimum and Maximum depth of water table based on observations from nearby wells and water bodies-** There are no water springs near about the lease area so there are no chances to encounter the water table during the mining throughout the year. Practically no fluctuation of water table within applied area throughout the year.
- Indicate maximum and minimum depth of working-** The proposed bottom level of working pit is expected in pit I up to 1409mRL & water table will not be intersected by mining operations as spring about 500m away from the proposed working area. No seasonal or perennial drainage exists within the proposed side of mine working, therefore chances to encounter the water within the working pit shall be nil during plan period. Before the commencement of rainy season, all the quantities of waste shall be filled back in the mined out pit so chances of accumulation of rainy water in the mining pit shall be nil during next five years.
- Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged.**



Mine working will not go beyond pit I up to 1409mRL & depth of pit during next five years shall be 9m, thus there is no chance to encounter the water table.

- d) Describe regional and local drainage pattern. Also indicate annual rain fall, catchment area, and likely quantity of rain water to flow through the lease area, arrangement for arresting solid wash off etc.

No seasonal or perennial drainage exists within the proposed side of mine working, therefore chances to encounter the water within the working pit shall be least during first five years. Before the commencement of rainy season, all the mined out pit shall be prematurely backfilled so chances of accumulation of rainy water in the mining pit shall be nil during next five years.

6.5 Disposal of waste:-

The top soil from the working benches will be removed by means of an excavator and stacked separately and used for backfilling from second year onwards. The interburden is low grade magnesite and shall be removed manual means and to be dumped separately and used for backfilling from third year onwards. The top soil and interburden material will be dumped separately on mineralized land, but these dumps are temporary in nature and it will be used in reclamation purpose. The yearly generation of soil and inter burden is given below:-

Year	Pit I	
	Top Soil (cum)	Interburden (cum)
1 ST YEAR	2212	4926
2 ND YEAR	972	5162
3 RD YEAR	1070	4617
4 TH YEAR	820	5182
5 TH YEAR	937	4789
Total	6011	24676



Year	Pit II	
	Top Soil (cum)	Interburden (cum)
1 ST YEAR	974	1459
2 ND YEAR	1210	2790
3 RD YEAR	614	3533
4 TH YEAR	1080	3690
5 TH YEAR	492	4579
Total	4370	16051

6.6 Storage and Preservation of top soil:-

The top soil shall be scraped & preserved for short period towards the slope side along the working pits. Dumping shall be carried out in single terrace & slope of dump shall be kept 35° to 40°. All the quantities shall be used in backfilling before the commencement monsoon period. Therefore no proposal has been envisaged for its separate dumping at mine side. Before the commencement of monsoon all the pits shall be backfilled.

6.7 Proposal for reclamation of land affected by mining activities:-

The quantities of interburden & soil to be generated, space available for backfilling, quantities of interburden & soil to be filled back and balance quantity of interburden & soil during next five years is given below:-

PIT-I

Year	Quantities of Interburden + Soil	Dimension of backfilling pit			Backfilling space (cum)	Quantities of backfilling (cum)	Balance quantities of Soil & IB to be dumped (cum)
		L	W	D			
1 st	7,138	-	-	-	-	-	7,138
2 nd	6,134	-	-	-	-	-	6,134
3 rd	5,687	109	21	6	13734	13,272	5,687
4 th	6,002	114	18	6	12,312	11,689	Nil
5 th	5,726	87	17	4	5,916	5,726	Nil
Total	30,687				31,962	30,687	18,959

PIT-II

Year	Quantities of Interburden + Soil	Dimension of backfilling pit			Backfilling space (cum)	Quantities of backfilling (cum)	Balance quantities of Soil & IB to be dumped (cum)
		L	W	D			
1 st	2433	-	-	-	-	-	2433
2 nd	4000	-	-	-	-	-	4000
3 rd	4147	82	14	6	6888	6433	4147
4 th	4770	90	17	6	9180	8917	Nil
5 th	5071	87	10	6	5220	5071	Nil
Total	20,421				21288	20421	10580

The Mine Closure plan is shown in Plate No. 10.

6.8 Measures for dust suppression:-

The existing kachha foot track shall be converted into cemented foot track. Apart from this water sprinkling on haul roads shall be undertaken during dry spell of months to suppress dust. The soil and interburden to be generated a temporarily in nature and all quantities shall be used in premature backfilling before commencement of monsoon as direction by district administration. After over the monsoon the backfilled material shall be rehandled by means of an excavator and dump over existing dump yard secure with toe walls.

6.9 Measures to minimize vibration due to blasting and check noise pollution:-

As the proposed method of mining is semi-mechanized open cast without drilling and blasting, the impact on this aspect is negligible. The noise pollution in the area is due to movement of machines and operations, which will be minimize by proper maintenance of machines, using mufflers for machines and workmen, developing green belt surrounding the mining area and pits.

6.10 Tailing Dam:-

No tailing dam is proposed in the soapstone mine.

6.11 Guidelines for scrutiny with respect to mineral beneficiation:-

No beneficiation/ mineral processing is required for soapstone mineral. Sorting sizing dressing & breaking shall be carried out manually. The soil coating within soapstone shall be dressed with brush & stacked separately. If any kind of impurities shall be observed with in soapstone lumps, it shall be broken with hammer and dressed manually and stacked separately.

6.12 How many time penalties imposed upon lessee against illegal Mining:-

Not applicable/fresh case.



6.13 Employment Potential / Mine Management Plan

Depending upon the General shifts working, following will be the proposed manpower

Employment Break-up

S. No.	Category (Full Time)	Numbers
1.	Geologist/Consultant Geologist	1
2.	Part time medical officer (1)	-
3.	Part time Environment Consultant (1)	-
4.	Mining Engineer/Mine Manager	1
5.	Supervisor/Skilled workers	2
6.	Unskilled	34
	Total	38

Total 38 full time employees/workers will be engaged/ proposed. Geologist/Geological Consultant & Mine Manager/Mining Engineer will work as per **Mineral Conservation & Development Rule- 2017** (MCDR 2017). Time to time geological observations/assessment of the lease area will be carried out & reported to State DGM as when required.

The total production proposed in first five years is 67,113 tonnes (First Five Years). It implies that 55.92 tonnes production per day considering 240 working days in a calendar year. Considering the OMS about 1.7 tonnes, this implies that 38 workers shall be enough to achieve the proposed production.

6.14 GEOTECHNICAL & GEOLOGICAL MEASURES/SAFETY MEASURES

Time to time provision of Geological & Geotechnical assessment is proposed for the projects

No		
1	ACCESS & HAUL ROADS	As per yearly or time to time assessment the Engineering Geologist may be better advice regarding relocation and safety measures for construction roads.
2	OPEN PIT MINE	As per yearly or time to time assessment the Engineering Geologist may be better advice regarding mineral body extension and safety

		measures for mineral extraction
3	LEASE BOUNDARY	As per yearly assessment or time to time the Engineering Geologist may be better advice regarding feasible landslide stabilization measures.
4	OTHER PARTS OF THE LEASE AREA	As per yearly or time to time assessment the Engineering Geologist may be better advice regarding all instability and Disaster management related problems within the project.

6.14 ENVIRONMENT MANAGEMENT PLAN

- a. Attach a note on the status of baseline information with regards to the following-
Existing Environment:

Physiography of the area: - The lease area comprises of terraced agricultural fields showing undulating topography. The slope of area is gentle: (9 to 15°) is towards south to north direction. The higher levels are found towards the eastern side of the area near boundary pillar 1 whereas the lowest horizons within the area are found near boundary pillar 6. The highest & lowest levels found in the area are of 1492.45 mRL and 1401.85 mRL respectively. The slopes in hill area vary from moderate to gentle. The drainage pattern of the area is dendrites in pattern & in first & second order. The area is infertile in nature.

The physiography of the area shows on Surface/Geological Plan of the area, surface and geological plan enclosed as **Plate No-3**.

Land Use- The Existing land use pattern is agricultural land. The gentle slope of area (9 to 15°) is towards south to north direction. The Existing land use pattern indicating the area already degraded due to quarrying/pitting dumping, roads, processing plants, workshop, township etc in a tabular form is as below:-

Name of land use	Forest land ha.	Agricultural Land (Ha.)	Waste Land (Ha.)	Grazing Land (Ha.)	Total (Ha.)
Pits and quarries	-	0.427	-	-	0.427
Waste Dump	-	-	-	-	-
Habitation	-	-	-	-	-
Foot track/PWD road	-	0.060	-	-	0.060
Drainage	-	-	-	-	-

Remaining undisturbed area	-	3.297	-	-	3.297
TOTAL	-	3.784 HA.	-	-	3.784 HA.

Water Regime:

The seasonal drainage exists outside of lease area & flows from east to west direction. The surrounding area is characterized by moderate slope, narrow ridges & forms the mountainous topography & rain water flows through the slope & meets the drainages & finally meets the main river. The water catchment of buffer zone is divided into one water shed.

Biological Environment:

Flora:

The area is basically agricultural. It is therefore deficient in trees. Fruits tree exits surrounding of habitation. The mining activities will be concentrated on cultivated fields. Therefore no flora shall be disturbed due to mining & allied activities.

Shrubs- Ghingaru with a few Jhitalu, Kilmora and Hisalu etc. occurs in the depressions.

Grasses: Kumaria, Doob, Shishoona, Gria and Bhawaria.

Fauna: No particular type of fauna finds except snakes, Jackals, wild cat, wild hen etc. are found in and around the area.

Quality of air, ambient noise level and water: The proposed site is located in the remote area having a clean atmosphere. Therefore the quality of ambient air will be as good, SPM, SO₂, NOX will be either below permissible limits or close to threshold limits. Similarity ambient noise level is as low as of any standard place. The water for drinking purpose comes from springs or nala. Water quality of nala will not deteriorate as mine working is proposed for away from nala. The backfilling and retaining wall at hoe edge the of reclaim pits will also remote the chances of fine particles to be mix with the nala water.

Climatic Condition:

Temperature:

Climatically the area falls in temperate zone with pleasant summer & extreme cold in winter. The area receives moderate snowfalls during winters between Decembers to February. The maximum temperature goes up to 40°C whereas the average temperature ranges in between 20°C to 30°C in months of January and February.

Relative Humidity: -

The relative Humidity rises from June to February with highest value recorded in the month of January & decreases during month of April and May. On the basis of past experience reveals that



the maximum average humidity in the month of January is about 96.33% while the minimum average humidity is about 31.43% during the month of April.

Rainfall: -

The area receives 70% on an average rainfall in between June end to mid September. The annual rainfall is 1280mm, the maximum rainfall receives during July to September while minimum rainfall receives during the month of January to February.

Human settlements:

Human settlements are distributed on fringes of buffer zone. The percentage of population of male is higher than females.

Public buildings, places of worship and monuments

No public building, places of workshop & any kind of Historical monuments exists within the lease area.

Indicate any sanctuary is located in the vicinity of leasehold

Lease area does not fall under notified area under water (Prevention & control of Pollution), Act 1974. Further there is not any National park/ Sanctuary within 10km radius of lease area.

b) Impact Assessment: Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation on environment on the following:

i) **Land Use-** Land use indicating the area likely to be degraded due to quarrying, dumping, roads, workshop, processing plant, tailing pond/dam, township etc.

The impact on land form or physiography will be land use on the hilly terrain will undergo radical changes due to the open cast mining.

During the first five years mining, land will be degraded due to mining & allied activities. The breakup of the land to be affected during the first five years due to mining operation is given as below-

ACTIVITIES	AT PRESENT (HA.)	AT END OF PLAN PERIOD (HA.)
Pits and quarries	0.427	1.127
Waste Dump	-	-
Habitation	-	-
Foot track/PWD road	0.060	0.080
Drainage	-	-
Remaining undisturbed area	3.297	2.577

TOTAL	3.784 HA.	3.784 HA.
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ii) Air pollution Control:

There are varies sources of fugitive dust emission during mining. The environment management for air pollution control includes.

Haul roads are always major sources of fugitive dust emission in mining activity. Following measures will be taken to reduce dust from haul roads.

- The main haul road leading to mine is already metalled.
- The un-metalled haul roads will be adequately compacted before being put into use.
- Periodically, water will be sprinkled on these roads to wet the surface.
- Over loading of tippers will be strictly avoided to prevent spillage.
- The road will be properly maintained.

Once the top soil dump has reached the designed size, grasses will be immediately planted on the dump.

Regular checking and maintenance of vehicles will be conducted and pollution under control certificate will be obtained. Mineral shall be filled into 50 kg plastic bags & manually transported to road side. No air quality shall be deteriorated due to mining activities.

iii) Water quality:

The impact on water quality will be confined to increased suspended solids during rain. The seasonal drainage flows in the surrounding of lease area. The dumps to be generated will be temporary in nature & used for the purpose of backfilling before the commencement. Mining shall be carried out far away from drainages therefore no adverse impact shall arise in water quality. Retaining walls and check dams will helps for the arresting of solid waste and it will reduce to contaminate the water during operation and in the rainy season.

iv) Noise Control:

The proposed mining method is through mechanized methods without adoption of drilling and blasting. Transportation from mine site road head will be done by manually or by mules. Hence, noise level due to transportation is negligible. To control the noise level following measures will be implemented.

- Noise level will be maintained below 90 db (A) in workplace (For 8 hour's exposure).
- All machineries will be maintained as per maintenance schedule to prevent undesirable noise.
- Proper maintenance of machineries and transport vehicles will be done to reduce the noise and keep the same within reasonable limit.

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v) **Vibration levels (due to blasting):**

As proposed mining method is opencast semi mechanized without drilling and blasting, hence, impact on this aspect will be insignificant.

vi) **Water regime:**

Surface Water:

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 toe walls along the soil and interburden dumps.

Ground Water:

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

Plantation along the Public road:

It is proposed that apt plantation is taken upon both side the road. The tree species will be selected from those already thriving will in the area as aforementioned. The spacing will be kept at about 5m. However, it will vary depending on species. The species with larger canopies will have higher than 5m.

Measure for protecting historical Monuments and for rehabilitation of human settlement likely to be disturbed due to mining activity:

No such feature exists within the mining would be confined to the agricultural land which is far away from the villages. Due to non mechanization, drilling and blasting there is no adverse effect on this account.

Socioeconomic beneficieate out of mining:

Overall the project will have positive and long term impact on environment. The project will also bring positive changes in terms of socio economic development by way of generating direct and indirect employment opportunities to the people of vicinity & the project will bring economic benefit to the state in terms of revenue generation.



CHAPTER-8

PROGRESSIVE MINE CLOSURE PLAN

1.0 Introduction:-

The State Govt. willing to grant Mining Lease over an area of 3.784 Ha. to **M/s Dhaolindag Mines And Mineral**, Nayna Vihar, Damuwdhunga Khatgodam, District-Nainital, Uttarakhand vide G.O./letter of intent NO. 1449/VII-A-1/2021/1(34)/21 dated 01.10.2021, for a period of twenty five (25) years (Attached Ann.1).

Location of Mine:-

The area can also be approached from Bageshwar via Bageshwar- Pithoragarh road is about 20 km from Bageshwar and lease area further connected by metalled road about 4 km from the Bageshwar- Pithoragarh road.

The location plan is shown in **Plate No. 1**. The Key Plan showing 5 km buffer zone is shown in **Plate No.2**.

Extent of Applied Area: - 3.784 Ha.

Type of lease area:-

S.No.	Type of land use	Area (Ha.)	Ownership/Occupancy	Village, Tehsil, District, State
1	Agricultural land	3.784	Private Individual	Garuwa Sirmoli, Kanda, Bageshwar, Uttarakhand
2	Gazing land	-		
3	Waste land	-		
4	Others	-		
	TOTAL	3.784		

1.1 Reasons for Closure:

At present there is no foreseeable reason regarding closure of mine.

The progressive mine closure plan is being submitted, under provisions of Uttarakhand Minor Mineral Concession Rule, 200

1.2 Statutory Obligations:

As per the provisions of Uttarakhand Minor Mineral Concession Rule, 2001 a progressive mine closure plan is required to be submitted. The progressive mine closure plan is being in accordance with the guidelines issued by DGM, Dehradun under Uttarakhand Notification No.

844/VII-1/2015/68-Kha/2015 Dated 31/07/2015 and Notification No. 1580/VII-1/2015/68-Kha/2015 Dated 07/10/2015.

Name & Address of the Applicant:-

M/s Dhaolinaag Mines And Mineral

Nayna Vihar, Damuwdhunga Khatgodam, District-Nainital, Uttarakhand



Name & Address of the Recognized Person:-

SHRI SANDEEP KUMAR

House No. 500/14

Skakuntalam Awas Vikas Colony

Circular Road,

Muzaffar Nagar (UP) 251001

2.0 Mine Description:-

2.1 Geology

Regional Geology:-

The area belongs to a part of Calc Zone of Tejam. The Stratigraphic sequence of the region as per monumental work (Geology of Lesser Himalaya, 1980) of Prof. K.S. Valdia, given as below-

Soil

Berinag Quartzite

-----Unconformity-----

Gangolihat Dolomite

Dolomite and Dolomitic limestone with Algal structures, Magnesite with minor talc/Talcoose phyllite and dolomitic intercalations.

-----Unconformity-----

Slates

Shales, Slates and Phyllites

The above Stratigraphic sequence as observed in this region is considered to be an inverted one. Soapstone pockets/lenses occurs within carbonates of Gangolihat Dolomite.

(I) The lithological succession within lease area is given as below-

Local Geology:-

Locally the area only shows the part of carbonates of Gangolihat Dolomite sequence. The local stratigraphy shows that the mineralized zone lies between upper & lower carbonates as below-

Upper Carbonates: Magnesite sporadic dolomite

Middle Talcose phyllite: Talc in pockets



Lower Carbonates: Dolomite & dolomitic intercalations

As per UNFC, the deposit is lenticular of all dimensions. UNFC category IV

Alluvial Cover:

A thin cover of top soil/alluvium is noticed all over the area. The color of the soil is yellowish-brown & thickness varies from 1.10m to 1.30m.

Soapstone bearing with Magnesite:

Soap stone occurred as lenses, pocket and stringers deposit with the low grade magnesite band.

Contact of Litho Units/rock types traced inferred:-

The lease area is terrace hill agriculture land with soil cover. No contacts of litho units/rock types been observed on the ground level.

Attitudes like strike and dip available in adequate numbers:-

Applied area is mostly covered with the soil cover

Structural features such as joints, folds, faults and their attitudes:-

No structural features observed within the lease area.

Delineation of mineralized/ore zones with definite demarcation of observed and inferred:-

Mineralization zone delineate with the help of pits and existing mining surrounding the area.

2.2 Reserves:-

Geological Reserves:

The summarized category-wise geological reserve estimated by is:-

Mineral Reserve	UNFC Code	Quantity in Tonnes	Grade
A. Total Mineral Reserve			
Proved Mineral Reserve	111	2,58,311	Cosmetic paper
Probable Mineral Reserve	121	77,749	Cosmetic paper
B. Total Remaining Resources			
Feasibility mineral Resources	211	21,220	Cosmetic paper
Prefeasibility mineral Resources	222	17,970	Cosmetic paper
Measured mineral Resources	331	-	-
Indicated mineral Resources	332	-	-
Inferred mineral Resources	333	-	-
Reconnaissance mineral	334	-	-

Resources		
Total (A+B)		3,75,150



2.3 Mining method:

(i) Existing Method of Mining:

It is fresh grant case of mining lease & mining operations yet to be commenced.

(ii) **Proposed Method of Mining:** - It will be opencast Mechanized mine. The overburden & interburden shall be removed by means of excavator. The soapstone shall be extracted with the help of excavator as well as manually with the help of hand tools like crow bar, chisels, pickaxe, hammers, spade. Different grade of soapstone will be stacked separately near the mining faces. No drilling & blasting shall be required during the operation because soapstone is a soft mineral. The soapstone shall be dressed manually & stacked separately. No further beneficiation shall be undertaken during first five years. The different grade of soapstone will be filled into 50 kg plastic bags & transported the road side by mules.

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

- Mining shall be carried out in two pits.
- It will be open cast Mechanized method.
- Average thickness of soil has been considered as 1.20 m & it shall be stacked separately.
- All the top soil, overburden & interburden shall be removed by means of excavators.
- Both height & width of benches shall be kept 3m and 3m.
- Face slope of benches shall be 70° with 45° overall pit slope.
- Backfilling will be undertaken after mining the soapstone up to full economical depth. The interburden and top soil will be temporarily dump separately towards the slope of working pit and shall be used for backfilling from second year onwards. Interburden shall be filled into mined out pit and later on thin soil shall be carped over it to restore maximum original topography of the area.
- Generally small quantities of magnesite interlocked with soapstone that is inseparable in nature so 5% of total recoverable soapstone has been considered as mining losses.
- Besides above assumed parameters in this Mine Plan for First Five year it is assessed during the exploration of this project area by RQP that the soapstone deposit is in tremendous quantity and somewhere wide spread in nature/thick manner without overburden/soil profile.



2.4 Mineral Beneficiation:

No mineral beneficiation will be under taken in five years. The soapstone will be dressed manually and different grade of soapstone stacked separately, which will be filled in to the bags and dispatched to various clients in Haldwani.

3.0 Review of implementation of mining plan/scheme of mining including five years progressive closure plan up to the final closure of mine:

Not applicable

4.0 Closure Plan

4.1 Mined out land:-

The mining will commenced from upper to lower level, pits are backfilled and formed it agriculture land when the pit reached the maximum economical depth. Before the commencement of monsoon period all the working pits shall be backfilled and reclaimed. The soil & interburden to be generated space available for backfilling, quantities of soil & interburden to be backfilled & balance quantities to be dumped is given below:

PIT-I

Year	Quantities of soil + interburden to be generated & dumped (cum)	Space available for backfilling (cum)	Dimension of backfilled pit (m)			Quantities of soil+ interburden to be used in backfilling (cum)	Balance quantities to be dumped (cum)
			l	w	d		
Ist	7,138	-	-	-	-	-	7,138
IIInd	6,134	-	-	-	-	-	6,134
IIIrd	5,687	109	21	6	13734	13,272	5,687
IVth	6,002	114	18	6	12,312	11,689	Nil
Vth	5,726	87	17	4	5,916	5,726	Nil
TOTAL	30,687				31,962	30,687	18,959

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RQP/UK/MO/No.014/Year-2010

PIT-II

Year	Quantities of soil + interburden to be generated & dumped (cum)	Space available for backfilling (cum)	Dimension of backfilled pit (m)			Quantities of soil interburden to be used in backfilling (cum)	Balance quantities to be dumped (cum)
			l	w	d		
Ist	2433	-	-	-	-	-	2433
IIInd	4000	-	-	-	-	-	4000
IIIrd	4147	82	14	6	6888	6433	4147
IVth	4770	90	17	6	9180	8917	Nil
Vth	5071	87	10	6	5220	5071	Nil
TOTAL	20,421				21288	20421	10580

The area already degraded due to mining & likely to be used during next five years, as below:

ACTIVITIES	AREA ALREADY USED (HA.)	AREA LIKELY TO BE USED IN MINING DURING NEXT FIVE YEARS (HA.)
Pits & Quarries	0.427	1.127
Foot track/approach road	0.060	0.080
TOTAL	0.487	1.207

(A) Mining:

Sl. No.	Activities	Area (Ha.)
1-	Area already broken up	0.427
2-	Area already backfilled/reclaimed	0.427


SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



Sl. No.	Activities
1-	Additional Area proposed to be broken up next year
2-	Additional Area proposed to be backfilled/reclaimed

(B) Dump:

Sl. No.	Activities	Area (Ha.)
1-	Area already covered by dump	-
2-	Additional Area to be covered by soil stack	0.072
3-	Additional area to be covered by interburden dump	0.230
4-	Dump area to be covered by protective measures	0.015

(C) Plantation:

Plantation will be done along the road side/outside the applied area.

Sl. No.	Activities	Area (Ha.)
1-	Area already covered under plantation	-
2-	Area proposed to be cover under plantation & protection work	0.40
	Total	0.40

4.2 Water Quality Management:

The impact on water quality will be confined to increased suspended solids during rain. The seasonal drainage flows in the surrounding of lease area. The dumps to be generated will be temporary in nature & used for the purpose of backfilling before the commencement. Mining shall be carried out far away from drainages therefore no adverse impact shall arise in water quality. Retaining walls and check dams will help for the arresting of solid waste and it will reduce to contaminate the water during operation and in the rainy season.

4.3 Air Quality Management:

There are various sources of fugitive dust emission during mining. The environment management for air pollution control includes.

Haul roads are always major sources of fugitive dust emission in mining activity. Following measures will be taken to reduce dust from haul roads.

- The main haul road leading to mine is already metalled.
- The un-metalled haul roads will be adequately compacted before being put into use.
- Periodically, water will be sprinkled on these roads to wet the surface.
- Over loading of tippers will be strictly avoided to prevent spillage.
- The road will be properly maintained.



Once the top soil dump has reached the designed size, grasses will be immediately planted on the dump.

Regular checking and maintenance of vehicles will be conducted and pollution under control certificate will be obtained. Mineral shall be filled into 50 kg plastic bags & manually transported to road side. No air quality shall be deteriorated due to mining activities.

4.4 Waste Management:

The waste generated during soapstone mining is top soil & interburden (Low grade magnesite boulders), all the waste includes top soil & interburden generated from each pits will be stacked temporarily towards the slope side of working pits. Dumping shall be carried out in single terrace & slope of dump shall be kept 35° to 40° . All the quantities shall be used in backfilling before the commencement monsoon period.

PIT-I

YEAR	INTERBURDEN (CUM)
Ist	4926
IInd	5162
IIIRD	4617
IVth	5182
Vth	4789
TOTAL	24,676

PIT-II

YEAR	INTERBURDEN (CUM)
Ist	1459
IInd	2790
IIIRD	3533
IVth	3690
Vth	4579
TOTAL	16,051

4.5 Top Soil Management:

The top soil shall be scraped & preserved for short period towards the slope side along the working pits. Dumping shall be carried out in single terrace & slope of dump shall be kept 35° to 40° . All the quantities shall be used in backfilling before the commencement monsoon period.



Therefore no proposal has been envisaged for its separate dumping at mine side. Before the commencement of monsoon all the pits shall be backfilled.

PIT-I

YEAR	TOP SOIL (CUM)
Ist	2212
IInd	972
IIIRD	1070
IVth	820
Vth	937
TOTAL	6011

PIT-II

YEAR	TOP SOIL (CUM)
Ist	974
IInd	1210
IIIRD	614
IVth	1080
Vth	492
TOTAL	4370

4.6 Tailing Dam Management:

No tailing dam is proposed in the soapstone mine.

4.7 Infrastructure:

No infrastructure facilities are present within the lease area. Only a foot track passed within the lease area & applicant shall maintain the foot track during PMCP period.

4.8 Disposal of Mining Machinery:

Mining shall be carried out open cast semi-mechanized without adoption of drilling & blasting. For the removal of overburden, the excavator shall be deployed during working hour on regular basis. Mining activity shall be abandoned during every year in the month of 15th June to 15th September.

4.9 Safety and Security:

Each worker shall be provided with helmets & safety shoes.

2. Safety belt shall be provided to workers a working the top benches.

3. Hanging of loose boulders shall be removed from mine faces.



4. The mining area shall be properly fenced to avoid any inadvertent entry in the mining pit.
5. Warning boards & working hours shall be displayed at conspicuous places.
6. Mining shall be carried out thought the formation of benches & slope of faces shall not exceed 70°.
7. There will be only one opening entry of mine which will have a manual gate & barricade under supervision of one Chowkidar.
8. Mining shall be carried out through the formation of benches of each 3.0m height. Mining pit shall reach maximum economical depth backfilling shall be carried out to restore maximum original topography of the area. The soil & interburden shall be backfilled, leveled it & used for agriculture purpose.

4.10 Disaster Management and Risk Management:

The mining is proposed in a gentler agricultural field. The mining will go up to the economical depth of 12m and thereafter backfilling will commence to restore the topography of the area. The mining faces shall be dressed properly because any hanging boulders/loose material may create fatal accidents to the laborers while working in the pit.

The area lays seismic zone IV, therefore precautionary measures shall be adopted. Tin shaded wooden houses shall be constructed in place of cemented houses in and around the area & lessee shall provide the sufficient amount of funds for these activities. In the landslide prone zone, fast growing soil binding species shall be planted & cemented bunds shall be made at the lower side so that minimum the effect of hazard. As per Disaster Management Act 2005, all measures issues to all Mine Establishments by the state government will be followed.

4.11 Care & maintenance during temporary discontinuance:

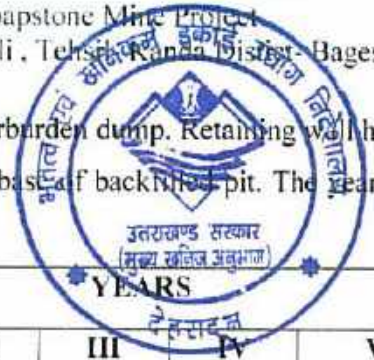
During monsoon period (i.e. from June to September) every year mining operations shall be temporarily discontinued and all the quantities soil & interburden shall be temporarily backfilled into mining pits leveled it & make it use for agriculture purpose. The backfilled mining pits shall properly fence to avoid any accident. Local person shall be employed to supervise the area & broken walls, broken check dams, etc shall be repaired immediately

5.0 Economic repercussions of closure of mine and Manpower Retrenchments:

All the workers would be hired on contractor labors.

7 Time scheduling for abandonment:

It is proposed that mining will open from upper levels and subsequently advance towards lower elevations so that concurrent reclamation will be under taken to restore the topography of area. The backfilled area will be again use for agricultural purpose. Toe walls having width & height



1.0 m will be made at the slope base of top soil stack & interburden dump. Retaining wall having width & height 1.0 m respectively will be made along the base of backfilled pit. The year wise schedule of completion of quantities is given below:-

ACTIVITIES	YEARS				
	I	II	III	IV	V
Toe wall at the base of soil stack (m)	40	45	50	-	-
Retaining wall along backfilled pit	-	-	250	310	200
Backfilling (Cum)	-	-	19705	20606	10797
Plantation (No. of sapling, outside the area)	70	70	70	70	70
Toe wall at the base of interburden dump	60	120	70	-	-

Geotechnical investigations/geological observations would be required for slope stabilization measures/for design & shape of retaining wall.

The tentative cost of implementation of activities during first five years is given below:-

Sl. No.	Activities	YEAR					Total amount in Rs.
		I	II	III	IV	V	
1.	Retaining wall at the edge of backfilled pit (Rs. 200/m)	-	-	50000	62000	40000	152000
2.	Plantation (Rs. 100/- sapling outside the area)	7000	7000	7000	7000	7000	35000
3.	Backfilling (Rs. 40/Cum)	-	-	788200	824240	431880	2044320
4.	Toe wall at the base of soil stack @40/m	1600	1800	2000	-	-	5400
5.	Toe wall at the base of interburden dump @40/m	2400	-	4800	-	-	7200
	Total						22,43,920

Geotechnical investigations/geological observations would be required for slope stabilization measures/for design & shape of retaining wall.

7.0 Abandonment Cost:

Sl. No.	Activities	YEAR					Total amount in Rs.
		I	II	III	IV	V	

1.	Retaining wall at the edge of backfilled pit (Rs. 200/m)	-	-	50000	62000	40000	152000
2.	Plantation (Rs. 50/- sapling outside the area)	7000	7000	7000	7000	7000	35000
3.	Backfilling (Rs. 40/Cum)	-	-	788200	824240	431880	2044320
4.	Toe wall at the base of soil stack @40/m	1600	1800	2000	-	-	5400
Total							22,36,720

8.0 FINANCIAL ASSURANCE:

Sl. No	Head	Area put on use at start of Plan (Ha.)	Additional requirement during plan period (Ha.)	Total (Ha.)	Area considered as fully reclaimed & rehabilitated (Ha.)	Net area considered for calculation (Ha.)
1-	Area under Mining	0.427	1.127	1.554	-	1.554
2-	Storage for top soil	-	0.080	0.080	-	0.080
3-	Interburden/dump	-	0.240	0.240	-	0.240
4-	Mineral storage	-	-	-	-	-
5-	Infrastructure (workshop, administrative building etc)	-	-	-	-	-
6-	Roads/Foot tracks	0.060	0.020	0.080	-	0.080
7-	Railways	-	-	-	-	-
8-	Tailing pond	-	-	-	-	-
9-	Effluent Treatment Plant	-	-	-	-	-
10-	Mineral Separation Plant	-	-	-	-	-
11-	Township area	-	-	-	-	-
12-	Others to specify (Retaining wall + toe walls)	-	0.015	0.015	-	0.015
GRAND TOTAL						1.969



Area to be considered for financial assurance 1.969 ha.

Financial assurance at the Rs.25, 000/- per ha.

1.969 Ha. X 25,000 = Rs. 49,225/-

(RUPEES FORTY NINE THOUSAND TWO HUNDRED TWENTY FIVE ONLY)

However, as per provisions of the Uttarakhand Minor Mineral Concession Rule, 2001, the minimum amount for this category mine the financial assurance will be Rs. 2 Lac. Lessee shall submit bank guarantee of 2.0 lac to Director, Geology and Mining Bhopalpani Dehradun.

KGP

JS

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2010

Very low by sum

Site Photographs



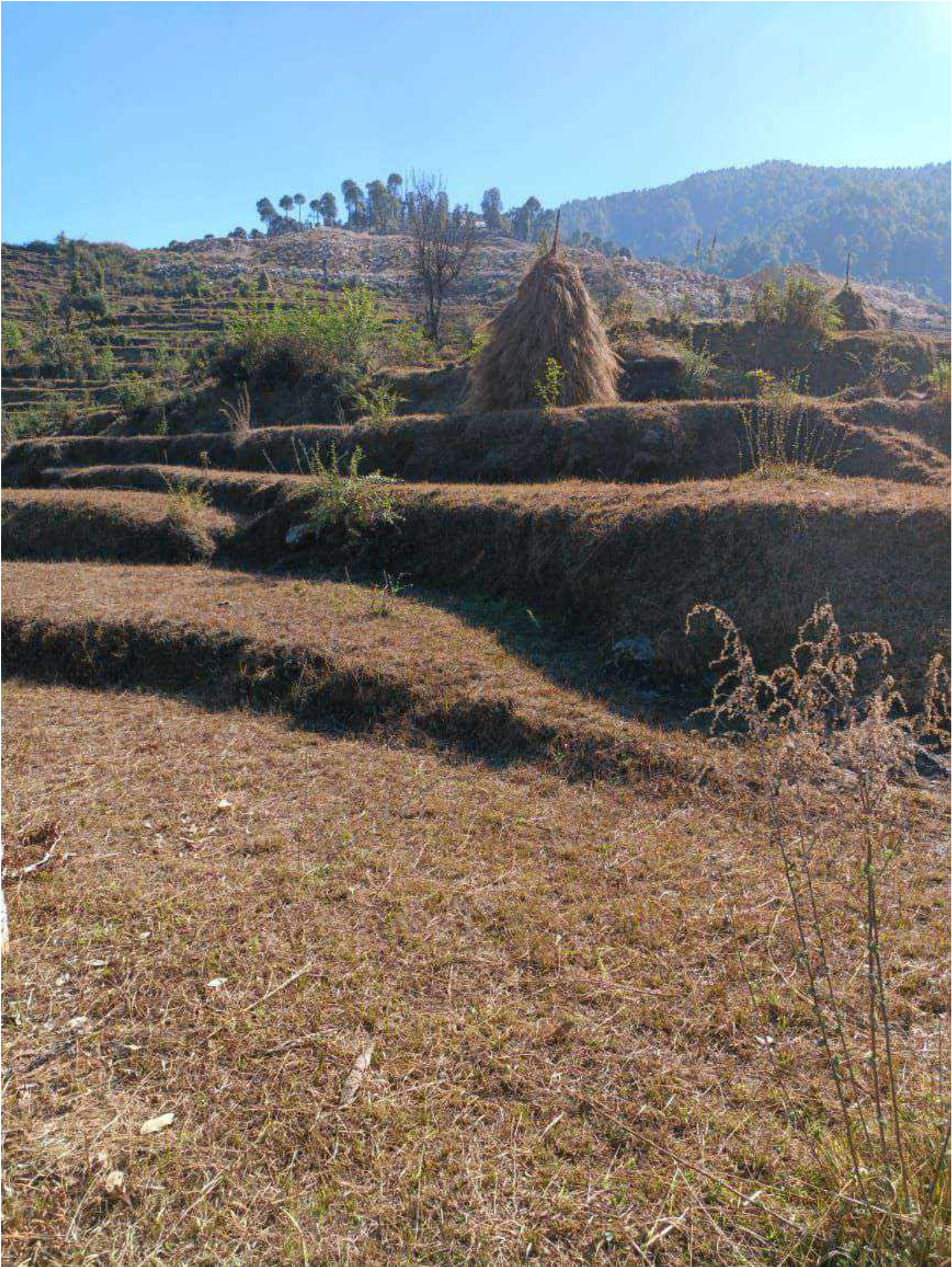


















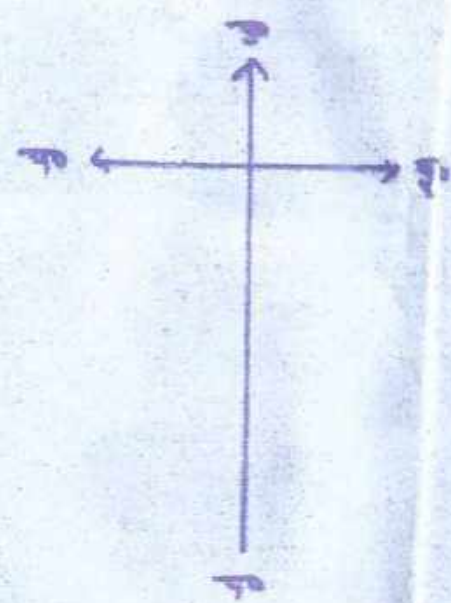
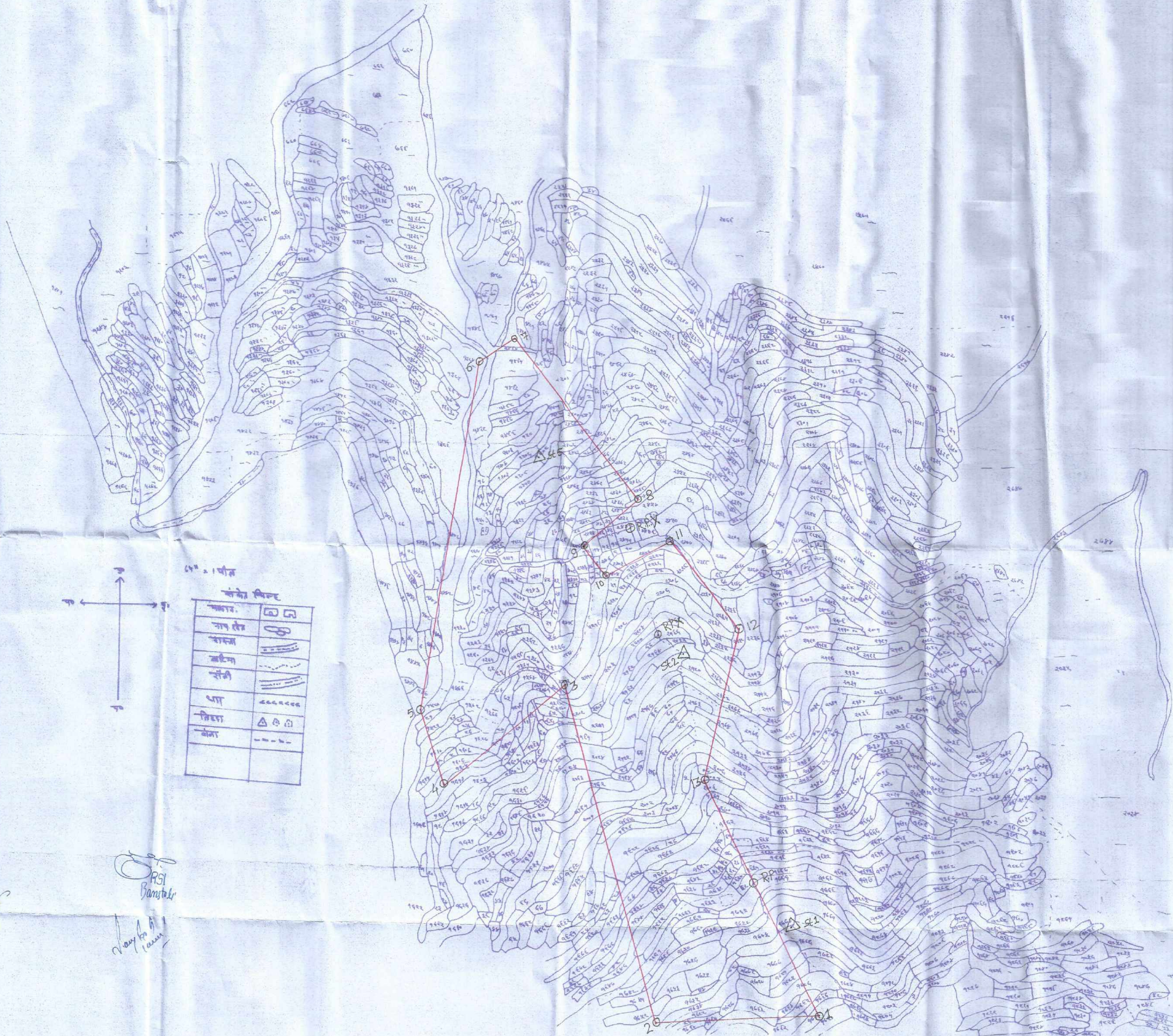








ANNEXURE IV
**Khasra map showing geo-
coordinate**



श्री १ पीठ

चिह्न	विवरण
चौक	चौक
सड़क	सड़क
खेत	खेत
झील	झील
धारा	धारा
बिस्तर	बिस्तर
बोरा	बोरा

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Handwritten signature and text in Hindi.

Handwritten signature and text in Hindi.

शाम - गडुवा शिरमोली
पत्र - जौनमोली
लोक - कांछा / कांछा

जनपद बांगेश्वर तहसील कांछा के ग्राम गडुवा शिरमोली में कार्यालय स्थापना 1449/VII-A-1/2021/364/2021
दिनांक 01 अक्टूबर 2021 के आशय पत्र मैमर्स चोलीनाग माइन खड मिश्र नयनामिहार दभुला दुगा
कालहंस माहगोदाम हठानी जिला मैनीताल (भगीदा) 1- श्री माया प्रसाद जोशी पुत्र श्री हरीश चंद्र जोशी
2- श्री जगदीश चंद्र लोहरी 3- श्री हरीश चंद्र लोहरी 4- श्री दीपचंद्र पंत 5- श्री रमचंद्र पंत 6- श्री विनीत कुमार
5/0 श्री जित सिंह के पक्ष में खेपहोन के खनन पर्यटन हेतु सीमांकित क्षेत्रफल 03.784 हेक्टेयर।
पिनर 1 ले 13 तक।

मुलक एवं खनिज इकाई
चिन्ता 2020 फा 1/2020
कानूनी/आयुक्त

SANDEEP KUMAR
RUPUKUMUNO.013/Year-2019

ANNEXURE V

Demarcation

Report

कार्यालय उपनिदेशक/ भूवैज्ञानिक
भूतत्व एवं खनिकर्म इकाई, उद्योग निदेशालय उत्तराखण्ड
जिला टास्क फोर्स बागेश्वर।



पत्रांक : 154 / जि0टा0फो0 / गौणखनिज / 2022-23

दिनांक : 26-08-2022

सेवा में,

निदेशक,
भूतत्व एवं खनिकर्म इकाई,
उद्योग निदेशालय, उत्तराखण्ड,
देहरादून।

विषय:

जनपद बागेश्वर तहसील काण्डा के ग्राम गणुवासरमोली में 08.136 हे० संशोधित 3.937 हे० भूमि में खनन पट्टा चाहने वालों में 01 धौलीनाग माइन्स एण्ड मिनरल्स, नयना विहार दमुवाढूंगा, कैनाल रोड कालटैक्स काठगोदाम, जिला नैनीताल भागीदार (1-श्री माया प्रसाद जोशी पुत्र श्री हरीश चन्द्र जोशी, निवासी ग्राम तुनेरा कोटगांव हाल निवासी धिंधारतोला तहसील व जिला बागेश्वर, 2-श्री जगदीश चन्द्र लोहनी पुत्र श्री हरीश चन्द्र लोहनी निवासी ग्राम गाडगांव तहसील व जनपद बागेश्वर, 3-श्री दीप चन्द्र पुत्र श्री पूरन चन्द्र पन्त ग्राम गणुवा सरमोली पो० ढट्टी तहसील काण्डा जनपद बागेश्वर, 4- श्री नवीन कुमार पुत्र श्री जीत सिंह, ग्राम जलमानी पो० स्याकोट तहसील व जनपद बागेश्वर के आवेदन पत्र दिनांक 26.08.2019 के क्रम में उत्तराखण्ड शासन औद्योगिक विकास अनुभाग-1 के कार्यालय ज्ञाप संख्या 1449/VII-A-1/2021/1 (34)/2021 दिनांक 01 अक्टूबर, 2021 के द्वारा आशय पत्र पर स्वीकृत क्षेत्र के सीमाबन्धन के सम्बन्ध में।

महोदय,

कृपया उपरोक्त विषयक उत्तराखण्ड शासन औद्योगिक विकास अनुभाग-1 के कार्यालय ज्ञाप संख्या 1449/VII-A-1/2021/1(34)/2021 दिनांक 01 अक्टूबर, 2021 के क्रम में संयुक्त निदेशक, भूतत्व एवं खनिकर्म इकाई, उद्योग निदेशालय, उत्तराखण्ड, देहरादून के पत्र संख्या 2383/मु०ख०/सोपस्टोन/42/भू०खनि०ई०/2019-20(2021-2022) दिनांक 6 अक्टूबर 2021 जो कि महोदय व जिला खान अधिकारी, भूतत्व एवं खनिकर्म इकाई, बागेश्वर को सम्बोधित तथा आवेदक को पृष्ठांकित है, के द्वारा मै० धौलीनाग माइन्स एण्ड मिनरल्स, नयना विहार दमुवाढूंगा, कैनाल रोड कालटैक्स काठगोदाम, जिला नैनीताल भागीदार (1-श्री माया प्रसाद जोशी पुत्र श्री हरीश चन्द्र जोशी, निवासी ग्राम तुनेरा कोटगांव हाल निवासी धिंधारतोला तहसील व जिला बागेश्वर, 2-श्री जगदीश चन्द्र लोहनी पुत्र श्री हरीश चन्द्र लोहनी निवासी ग्राम गाडगांव तहसील व जनपद बागेश्वर, 3-श्री दीप चन्द्र पुत्र श्री पूरन चन्द्र पन्त ग्राम गणुवा सरमोली पो० ढट्टी तहसील काण्डा जनपद बागेश्वर, 4- श्री नवीन कुमार पुत्र श्री जीत सिंह, ग्राम जलमानी पो० स्याकोट तहसील व जनपद बागेश्वर के पक्ष में जनपद व तहसील बागेश्वर के ग्राम गणुवासरमोली में 08.136 हे० संशोधित 3.937 हे०, भूमि में 25 वर्ष की अवधि हेतु खनिज सोपस्टोन का खनन पट्टा हेतु निगंत आशय पत्र के सम्बन्ध में आवेदित क्षेत्र का सीमाबन्धन किये जाने के आदेश दिये गये हैं। उक्त के अनुपालन में भूमि का मौके पर सीमांकन हेतु परीक्षण किया गया तथा सीमांकन कर सीमांकित मानचित्र तथा खसरा विवरण तैयार किया गया, जिसमें भूमिधर के नाम पर दर्ज भूमि सार्वजनिक प्रयोजन की भूमि तथा राज्य सरकार की शेष भूमि को दर्शित किया गया है। परीक्षण के दौरान पाया गया कि कतिपय खसरा नम्बरान (खसरा न० 1333म०, 1385म०, 1403म०, 1471म०, 1472म०, 1480म०, 1481म०, 1488म०, 1611म०, 1766म०, 1767म०, 1774म०, 1920म०, 1924म०, 1977म०, 1982म०, 2189म०, 2237म०, 2399म०, 2501म०, 2505 म०, तथा 2506 म०) जो मानचित्र में सीमांकित क्षेत्र से बाहर हैं, पूर्व में लिपिकीय त्रुटिवश खसरा विवरण में दर्ज हो गये थे। उक्त खसरा नम्बरान को नवीन तैयार खसरा विवरण में हटा दिया गया है, जिसके उपरान्त आशय पत्र में स्वीकृत सीमांकित मानचित्र का कुल संशोधित रकबा भू-अमिलेखानुसार कुल 3.784 हे० आता है।

उक्त के अनुपालन में आवेदित क्षेत्र का सीमाबन्धन आवेदक की उपस्थिति में विभागीय सर्वेक्षक द्वारा राजस्व उपनिरीक्षक व वन दरोगा की सहायता से दिनांक 23.10.2021 को सम्पन्न किया गया। सीमाबन्धित क्षेत्र के अन्तर्गत पड़ने वाली भूमि का विवरण जिलाधिकारी, बागेश्वर के पत्र सं 694/तीस - खनन-सी०ब०/2022 दिनांक 21.05.2022 के द्वारा प्राप्त हो गया है, जिसके अनुसार सीमाबन्धित क्षेत्र के अन्तर्गत पड़ने वाली भूमि का विवरण निम्नवत् है:-

SANDEEP KUMAR
RQP/UKG/JUNO.013/Year-2019



भूमिधरों की निजीनाप भूमि(है०)			राज्यसरकार की भूमि(है०)						सम्पूर्ण योग(है०)		
ज०वि० श्रेणी.1क	गै०ज०वि० श्रेणी.4क	योग	सार्वजनिक प्रयोजन की भूमि				राज्य सरकार की अन्य भूमि				
			गै०ज०वि०श्रेणी.10(1)			गै०ज०वि० श्रेणी.10(2)	योग	गै०ज०वि० श्रेणी.7क	गै०ज०वि० 9(3)ड.	योग	
संकमणीय भूमिधर	संकमणीय पट्टेदार		गूल	नौला	रौली	रास्ता		सरकारी पट्टेदार	बकाआ०		
1	2	3	4	5	6	7	8	9	10	11	12
3.263	0.036	3.299	0.004	0.001	0.105	0.043	0.153	0.006	0.326	0.332	3.784

सीमाबन्धन के दौरान पट्टाधारक श्री माया प्रसाद जोशी व श्री जगदीश चन्द्र लोहनी को सभी सीमास्तम्भों के स्थान दिखा/बता दिये गये थे। राजस्व उपनिरीक्षक की आख्या दिनांक 23.10.2021 (छायाप्रति) संलग्न में स्पष्ट किया गया है कि आवेदक द्वारा बताये गये समस्त सीमास्तम्भों का निर्माण कर लिया गया है। सीमाबंधित क्षेत्र को खसरा मानचित्र में लाल रंग से दर्शाया गया है।

आवेदक द्वारा निर्धारित सीमाबन्धन शुल्क रु० 5,000.00 (पांच हजार) के ट्रेजरी चालान की छायाप्रति इस कार्यालय में प्रस्तुत की गयी है। सीमाबन्धन प्रतिवेदन मय खसरा मानचित्र की सत्यापित प्रति, राजस्व उपनिरीक्षक की आख्या दिनांक 23.10.2021 एवं 23.10.2021 की छायाप्रति, सीमाबंधित क्षेत्रान्तर्गत पडने वाली भूमि के सम्बन्ध में उपजिलाधिकारी बागेश्वर तथा जिला अधिकारी बागेश्वर द्वारा उपलब्ध करायी गयी आख्या की प्रति मय संलग्नकों के इस पत्र के साथ संलग्न कर आपके आवश्यक कार्यवाही हेतु सादर प्रेषित है।

संलग्नक उपरोक्तानुसार

भवदीय

 (लेख राज)
 उपनिदेशक/भूवैज्ञानिक।






SANDEEP KUMAR
 RQP/UK&MU/No 013/Year-2019

कार्यालय उपनिदेशक / भूवैज्ञानिक
भूतत्व एवं खनिकर्म इकाई, उद्योग निदेशालय उत्तराखण्ड, बागेश्वर।



आवेदक का नाम - मै० धौलीनाग माइन्स एण्ड मिनरल्स, नयना बिहार दमुवाढूंगा कैनाल रोड कांल डैक्स काठमोडम, हल्द्वानी जिला नैनीताल भागीदार श्री माया प्रसाद जोशी आदि।
ग्राम का नाम :- गणुवासरमोली, तहसील काण्डा जिला :- बागेश्वर, सीमाबंधित क्षेत्रफल : 03.784 है०
खनिज का नाम :- सोपस्टोन, मानचित्र का प्रकार :- खसरा मानचित्र, सन्दर्भ बिन्दु - खेत न० 1765 का कोना
सर्वेक्षण का दिनांक :- 23.10.2021 ।

स्टेशन से	स्टेशन तक	दिक्मान	दूरी	कार्नेर पिलर	रिमार्क
स्टेशन 1	R.P.	317°-46'	31.00 मी०	-	R.P. खेत न० 1765 का कोना
	पिलर -1	163°-00'	51.00 मी०	पिलर -1	
	पिलर -2	234°-30'	90.00 मी०	पिलर -2	
	पिलर -13	329°-00'	93.00 मी०	पिलर -13	
स्टेशन- 2	RPX	306°-00'	19.00 मी०	RPX	खेत न० 2197 का कोना
	पिलर -3	255°-00'	66.50 मी०	पिलर -3	
	पिलर-10	314°-00'	63.00 मी०	पिलर-10	
	पिलर-11	351°-30'	64.00 मी०	पिलर-11	
	पिलर-12	63°-30'	33.00 मी०	पिलर-12	
	स्टेशन 3	280°-30'	76.00 मी०	स्टेशन 3	
स्टेशन- 4	स्टेशन- 3	90°-30'	21.00 मी०	स्टेशन- 3	
	पिलर -4	203°-00'	92.00 मी०	पिलर -4	
	पिलर -5	228°-00'	66.00 मी०	पिलर -5	
	पिलर -9	34°-30'	62.00 मी०	पिलर -9	
स्टेशन- 5	RPY	126°-30'	65.00 मी०	RPY	मकान का कोना
	पिलर - 6	328°-30'	61.00 मी०	पिलर - 6	
	पिलर - 7	348°-30'	67.00 मी०	पिलर - 7	
	पिलर - 8	111°-30'	61.00 मी०	पिलर - 8	

सर्वेक्षक

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019

कार्यालय उपनिदेशक / भूवैज्ञानिक
भूतत्व एवं खनिकर्म इकाई, उद्योग निदेशालय उत्तराखण्ड, बागेश्वर।
सीमाबन्धित क्षेत्र की चौहद्दी निम्नानुसार है :-



आवेदक का नाम :- मै० धौलीनाग माइन्स एण्ड मिनरल्स, नयना बिहार दमुवाढूंगा कैनाल रोड काल टेक्स कातगोबाम, हज्दानी जिला नैनीताल भागीदार श्री माया प्रसाद जोशी आदि।
ग्राम का नाम :- गणुवासरमोली, तहसील काण्डा जिला :- बागेश्वर, सीमाबन्धित क्षेत्रफल : 03.784 है०
खनिज का नाम :- सोपस्टोन, मानचित्र का प्रकार :- खसरा मानचित्र,
सर्वेक्षण का दिनांक :- 23.10.2021 ।

क्षेत्र के उत्तर में :- पिलर-6 खेत नं० 1384, पिलर-7 खेत नं० 1479,

क्षेत्र के दक्षिण में :- पिलर - 1 खेत नं० 1791, पिलर -2 खेत नं० 1735, ।

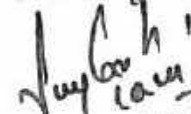
क्षेत्र के पूरब में :- पिलर - 8 खेत नं० 2440, पिलर- 9 खेत नं० 2415, पिलर-10 खेत नं० 2404, पिलर-11 खेत नं० 2401, पिलर-12 खेत नं० 2239, पिलर-13 खेत नं० 2008, ।

क्षेत्र के पश्चिम में :- पिलर -3 खेत नं० 2212, पिलर - 4 खेत नं० 1605, पिलर - 5 खेत नं० 1447, ।


सर्वेक्षक


उपनिदेशक / भूवैज्ञानिक

उपरोक्त सीमाबन्धन से मैं पूर्ण रूप से सहमत हूँ।


पट्टाधारक / प्रतिनिधि






SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2010

संयुक्त सीमांकन रिपोर्ट



आज दिनांक 23/10/2021 को जनपद बागेश्वर, तहसील काण्डा

में श्री मै. घौलीना माइन्स ड्रॉड मिन्दतम

के पक्ष में स्वीकृत न. 437 के क्षेत्र का सीमाबन्धन

क्षेत्रीय राजस्व उपनिरीक्षक द्वारा बताये गये सन्दर्भित बिन्दु के आधार पर पट्टाधारक / प्रतिनिधि श्री साया प्रसाद जोशी

वं श्री जादीवाचंद लोहनी की उपस्थिति में सम्बन्धित विभागों के साथ किया गया। आवेदक/आवेदिका / प्रतिनिधि को सभी

सीमास्तम्भों के स्थान दिखा/बता दिये गये हैं।

R.
Rajendra
क. 52
का/ 657

R.S.J.
Banstoli

र. 52
र. 52
र. 52

जादीवाचंद लोहनी

K. 52

जादीवाचंद लोहनी

SA

SANDEEP KUMAR
RQ/10/2019/No.013/Year-2019



आज दिनांक 23/10/2021 को जनपद बागेश्वर, तहसील काण्डा

के ग्राम ~~सुशुक्ला मिमसीनी~~

में श्री ~~मै० चौलीनाग साइन्स एंड मिनिस्ट्रल्स~~ के पक्ष में स्वीकृत उपउत्तर है० क्षेत्र में

सीमाबन्धन के दौरान बताये गये सीमास्तम्भों का निर्माण आवेदक द्वारा कर लिया गया है।


RSI
Banastuli






SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019

ANNEXURE VI

LAND NOC



सत्यमेव जयते

INDIA NON JUDICIAL Government of Uttarakhand

e-Stamp



NOTARIAL

NOTARIAL

Certificate No. : IN-UK35325381300753R
Completion Date : 12-Sep-2019 10:52 AM
Account No. : NONACC (SV)/uk12504041 KANDA, UK-BGR
Stamp No. : SUBIN-UKUK1250404728615F17C47B03
First Party : MOHAN RAM SO KESAR RAM RO GARJWASARMOLI KANDA BGR
Description of Document : Article 4 Affidavit
Present Value : NA
Consideration (Rs.) : 10
(Ten only)
First Party : MOHAN RAM SO KESAR RAM RO GARJWASARMOLI KANDA BGR
Second Party : NONE
Stamp Description : MOHAN RAM SO KESAR RAM RO GARJWASARMOLI KANDA BGR
Stamp Value (Rs.) : 10
(Ten only)



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अनापत्ति प्रमाण पत्र

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SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



सहमति / अनापत्ति पत्र

श्री / श्रीमती सौ. रमेश चंद्र

पति रमेश चंद्र

गणेशपुरी ग्राम गणेशपुरी/सिमरौली पो. 0...
 /वाली यह सहमति /अनापत्ति पत्र इस आधार पर जारी किया गया है कि आप अपने पति के साथ गणेशपुरी/सिमरौली/अध्याली तहसील का...
 में अपने पति के साथ गणेशपुरी/सिमरौली/अध्याली तहसील का...
 में अपनी भूमि धरी / कब्जे कास्त / खेती की भूमि पर...
 के खनन पट्टे हेतु श्री भारत प्रसाद

द्वारा (कोटवाल) चित्तौड़गढ़ जिला...
श्री श्रीमान गान्धेश चंद्र...
गणेशपुरी/सिमरौली/अध्याली तहसील...
 /सोप स्टोन का पट्टा स्वीकृत मिले जाने से आपकी सहमति पत्र
 /अनापत्ति पत्र दे रहा हूँ। मेरे द्वारा इसके सिवाय पूरा न मिले जाने के बाद
 /अनापत्ति पत्र नहीं दिया गया है और नही भविष्य में किसी अन्य के पत्र
 आपकी नाम भूमि खनन पट्टे हेतु दूंगा / दूंगा

दिनांक 16-9-2019

स्थान गणेशपुरी/सिमरौली/अध्याली

0000

हस्ताक्षर

सहमति / अनापत्ति पत्र

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INDIA NON JUDICIAL
Government of Uttarakhand

e-Stamp



Certificate No.

Certificate Date

Certificate Time

Certificate Reference

Full Name

Document

Document Description

Consent Price (Rs.)

Full Name

Signature

Signature By

Signature Amount (Rs.)

: IN-UK35324881849666R

: 12-Sep-2019 10:52 AM

: NONACC (SV) uk1250404 KANDU UK-EG

: SUBIN-UKUK1250404728633510115259

: GOURA DEVI WO NAR RAM RO GARUWASARMOLI KANDA EGP

: Article 4 Affidavit

: NA

: 10

(Ten only)

: GOURA DEVI WO NAR RAM RO GARUWASARMOLI KANDA EGP

: NONE

: GOURA DEVI WO NAR RAM RO GARUWASARMOLI KANDA EGP

: 10

(Ten only)



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अनापत्ति प्रमाण पत्र

Signature

Signature

Signature



Signature

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



सहमति / अनापत्ति पत्र

२ श्री / श्रीमती

जर राम

मर राध
गणुवासिरमोली पो. ठपती
वाली यह राहगति / अनापति पत्र इस आशय है प्रस्ताव पर देहरादून
गणुवासिरमोली / अगली तहसील कापका जिला कापका का जिला पर
धरी / काबिज कास्तकार हूँ। मैं पूर्ण रूप से अपनी भूमि धरी की
तथा मैं अपनी भूमि धरी / कब्जे कास्त / जिला की भूमि पर जमीन का
को खनन पट्टे हेतु श्री माया प्रसाद जेठवाला

दुनेरा (कोटा) पो. जो. विहार कोटा में रहनेवाले
 धोबीनाग भाइयों स्व. विमल नयन विहार सागेश्वर के पक्ष में
 जेजा, जैनीताल का पट्टा स्वीकृत किया जाने हेतु अपनी साहमति पत्र
 / सोप स्टोन का पट्टा स्वीकृत किया जाने हेतु अपनी साहमति पत्र
 दे रहा हूँ। मेरे द्वारा इसके विपरीत पक्ष में किसी अन्य के पक्ष में
 / अनापत्ति पत्र नहीं दिया गया है और न ही भविष्य में किसी अन्य के पक्ष
 अपनी नाम भूमि खनन पट्टे हेतु पूंगा / पूगी।

15-9-2019

मान जगुवा सिखोली

1050

4516

1941-1942 1943-1944

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2010.

INDIA NON JUDICIAL
Government of Uttara

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1 IN-UK39333019104157R
2 22-Sep-2019 12:57 PM
3 NONACC (SV)/ uk1255304 BAIRESHVAP UK-REG
4 SUBIN-UKUK1255304809698548988 BGR
5 SHEKHAR RAM SO JEET RAM
6 Article 4 Affidavit
7 VIL GARUWASAMOLI BGR
8 0
9 (Zero)
10 SHEKHAR RAM SO JEET RAM
11 NA
12 SHEKHAR RAM SO JEET RAM
13 10
14 Ten only)

TICKET
CANCELLED

NOTARIAL NOTARIAL

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अनापत्ति प्रमाण पत्र



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Handwritten initials

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2010



INDIA NON JUDICIAL
Government of Uttarakhand

e-Stamp



Certificate No. : IN-UK39333286546109R
 Certificate Issue Date : 22-Sep-2019 12:59 PM
 Applicant Name : NONACC (SV)/ uk12553C4/ BAGESHWAR, UK
 Applicant Address : SUBIN-UKUK1255304809687422107937
 Applicant Age : GULAB RAM SO JEET RAM
 Applicant Gender : Article 4 Affidavit
 Applicant Occupation : VILL GARUWASARMOLI FC DH
 Applicant Religion : 0
 Applicant Caste : (Zero)
 Applicant Party : GULAB RAM SO JEET RAM
 Stamp Duty By : NA
 Stamp Duty Amount (Rs.) : GULAB RAM SO JEET RAM
 Stamp Duty Amount (Rs.) : 10
 Stamp Duty Amount (Rs.) : Ten only

~~NOTARY~~
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आदापति उपाग पत्र



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SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019

२३१

हमेश (कोटा) पो. नं. ० दि.
होलीमात्र नॉइस एंड शिन्सल

महाराष्ट्र / सोप स्टोन का पट्टा स्वीकृत किये जाने हेतु अपनी शक्तों पर
आश्रित पत्र दे रहा हूँ । मेरे द्वारा इसके सिवाय मुझे किसी अन्य के पत्र में
आश्रित पत्र नहीं दिया गया है और न ही भविष्य में किसी अन्य के पत्र
में आश्रित नाम भूमि खनन पट्टा हेतु दूंगा / दूगी ।

मान नशुदा सिरभी नी

ମୌଳିକ-୩୦

हरिताक्षः

— *Prüfung* — *Prüfung* — *Prüfung* —

Blagovest, Izrael

109-19

1986

Very truly,
Yours

02

Handwritten signature: *Handwritten signature*

[Signature]

SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



सत्यमेव जयते

INDIA NON JUDICIAL Government of Uttarakhand

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Certificate No.	: IN-UK35528364420845R
Certificate Issued Date	: 12-Sep-2019 07:56 PM
Article Reference	: NONACC (SV) uk1255304/ BAGESHWAR UK-BG
Unique Doc. Reference	: SUBIN-UKUK1255304732816070531741P
Document	: TARA BHAURYAL SO SHER SINGH
Process Description	: Article 4 Affidavit
Certificate Price (Rs.)	: VILL GARUWASARMOLI BGP
First Price	: 0
Stamp Price	: (Zero)
Stamp Duty Paid By	: TARA BHAURYAL SO SHER SINGH
Stamp Duty Amount (Rs.)	: NA
	: TARA BHAURYAL SO SHER SINGH
	: 10
	: (Ten only)



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SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



INDIA NON JUDICIAL
Government of Uttarakhand

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NOTARIAL

Certificate No.	: IN-UK27609230396914R
Certificate Issue Date	: 27-Jul-2019 06:58 PM
Account Field No.	: NONACC (SV)/ uk1217204/ HALDWANI/ UK-NT
Unique Doc. No./evidence	: SUBIN-UKUK121720457330127662323R
Registered	: BRIJESH KUMAR SF HARISH CHANDRA GARUWASARMOL BGR
Description of Document	: Article 4 Affidavit
Previous Description	: NA
Conservation Price (Rs.)	: 0 (Zero)
First Fee	: BRIJESH KUMAR SF HARISH CHANDRA GARUWASARMOL BGR
Second Fee	: NA
Stamp Duty Paid By	: BRIJESH KUMAR SF HARISH CHANDRA GARUWASARMOL BGR
Stamp Duty Paid (Rs.)	: 10 (Ten only)



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SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019



सत्यमेव जयते

INDIA NON JUDICIAL Government of Uttarakhand

e-Stamp



Certificate No.

: IN-UK27609343779217R

Certificate issued Date

: 27-Jul-2019 06:58 PM

Amount Reference

: NONACC (SV) uk1217204/HALOWANI/UK-NT

NOTARIAL

Document Reference

: SUBIN-UKUK1217204573/2019/12/10NBR

Document

: BHAGWATI PRASAD SF HARISH CHANDRA GARUWASARMOLI
BG

Document Type (Document)

: Article 4 Affidavit

Document Description

: NA

Document Price (Rs.)

: 0
(Zero)

Document

: BHAGWATI PRASAD SF HARISH CHANDRA GARUWASARMOLI
BG

Document

: NA

Document

: BHAGWATI PRASAD SF HARISH CHANDRA GARUWASARMOLI
BG

Stamp Duty Amount (Rs.)

: 10
(Ten only)

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अनापत्ति प्रमाण पत्र



SANDEEP KUMAR
RQP/UKGMU/No.013/Year-2019

ANNEXURE VII
Memorandum
of
Understanding

MEMORANDUM OF UNDERSTANDING

To,
The Director,
M/s. Cognizance Research India Private Ltd.
Suite-B02, Block H-61, Sector- 63,
Noida-201301

Date:

Please refer to your quotation for obtaining Environmental Clearance from the concerned authorities in respect of Garuwa Sirmoli Soapstone Mining Project Area 3.784 Ha. for a maximum Proposed Production of 15462 TPA (Vth Year) at Village- Garuwa Sirmoli, Tehsil- Kanda and District-Bageshwar State- Uttarakhand by M/s Dhaulinaag Mines & Minerals and the consultant should be submitted and subsequent discussions on the subject.

The following terms have been mutually agreed:

A. Scope of Work

1. Preparation of Form I PFR for Application of ToR.
2. ToR Presentation.
3. Collecting Various Baseline data of different Environmental Parameters for preparation of Draft EIA.
4. Preparation of Draft EIA/ EMP Report covering ToR including points, typing, drafting etc. as per guidelines of MoEF and State Pollution Control Board.
5. Submission of Application Forms along with Draft EIA/EMP report to SPCB& cc to concerned departments as per the Appendix IV of the EIA Notification 2006.
6. Technical assistance in public hearing as per the appendix IV of the EIA Notification.
7. Submission of Final EIA/ EMP report to SEAC/SEIAA-UP incorporating the concerns raised during public hearing/consultation.
8. Presentation to Concerned committee/Authorities
9. Reply submission if query raised by committee.
10. Obtaining Environmental Clearance

Obligation of the client

The client shall furnish and provide all necessary / requisite documents and NOC's as may be required by the authorities for obtaining EC in order to execute the project in said time frame.

Terms & Condition:-

1. You will commence the work immediately on receipt of this order.
2. If due to any reason whatsoever, the scope of work is reduced or is abandoned, the Consultant shall be paid for the work done as per mutual decision on the basis of payment clause.
3. Copyright of all the drawings and the works executed from you will remain the property of the employer.
4. Documents related to Land, Site Layout Plan, other approvals obtained from authorities and other company documents etc. required by the concerned authorities will be provided by us.
5. The above mention fees doesn't include public hearing fees, public hearing expenses, official fees and any other unofficial expenses.

This letter is being forwarded in two copies. The enclosed copy may please be returned after your endorsement, to this office as a letter for your acceptance of the above details, at the earliest possible.



Signature

ANNEXURE VIII

Corporate Environmental Policy (CEP)

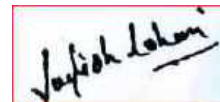
Corporate Environmental Policy

I, **M/s Dhaulinaag Mines & Minerals** mine owner of Soapstone mine at Village- Garuwa Sirmoli, Tehsil- Kanda and District- Bageshwar, Uttarakhand.

I reaffirm my commitment to contributing towards a clean and sustainable environment and continually enhancing our environmental performance as an integral part of our business philosophy and values.

Towards this commitment, I shall:

- Integrate sound environmental management practices in all our activities.
- Conduct our operations in an environmentally responsible manner to comply with applicable legal and other requirements related to its environmental aspects and strive to go beyond.
- Progressively adopt cleaner and energy efficient technologies.
- Increase greenery in and around our working areas and mines.
- Strive for continual improvement in our environmental performance by setting challenging targets, measuring progress, taking corrective action and communicating environmental information to all concerned.
- Enhance environmental awareness amongst employees working for and on behalf of us and the general populace around working areas and mines.
- Encourage our business associates to adopt similar approach for environmental protection.



(M/s Dhaulinaag Mines & Minerals)

Signature