EXECUTIVE SUMMARY

1.1 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, Uttrakhand, 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 Meravarana Sand, Bajri & Boulder Mining Project in the applied mining lease area measuring 6.727Ha. The proposed project falls under Category “B1” as per EIA Notification2006 its amendment 2009, 2011, 2012& 2018 of the Ministry of Environment and Forests, New Delhi and NGT order dated 13.09.2018 & OM dated 12th December 2018 by MOEF & CC.

1.2 IDENTIFICATION OF PROJECT & PROJECTPROPONENT

The proposed project of Shri Rajesh Sharma for Mervarana Sand,Bajri&Boulder Mining Project which covers an area of 6.727 Located a Khasra No-38 &41, Village- Meravarana ,Tehsil-Sitarganj, District- Udham singh Nagar, State-Uttarakhand. LOI has been granted in favour of Shri Rajesh Sharma S/O Shri Ram Gopal being The highest bidder was issued letter of intent

(LOI) by state government vide letter no. 2457/VII-1/18/02(89)/2018 dated 20.12.2018 and after fresh demarcation revised letter of intent issued vide letter no. 1164/VII-A-1/2021/2(89)/18 dated 25th August 2021 attached as Annexure II.

The RBM will be used for making buildings, bridges, infrastructure etc. The RBM of lease area is soft, medium to coarse grained yellowish in color. RBM is an essential minor mineral used extensively across the country for construction purposes.

Minor Minerals are mainly consumed by infrastructure & housing industries & development. Virtually there is no construction or infrastructure building work is possible without these minor minerals, hence the same can be assumed as backbone of the infrastructural growth of India. The production per year will be **242352 tonnes** which shall be achieved by the end of 5th year

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

Proponent & Address

Shri Rajesh Sharma

S/O Shri Ram Gopal

R/O-2-450/1,Tulsinagar,Polisheet,

Haldwani, Dist.-Nainital (U.K)

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

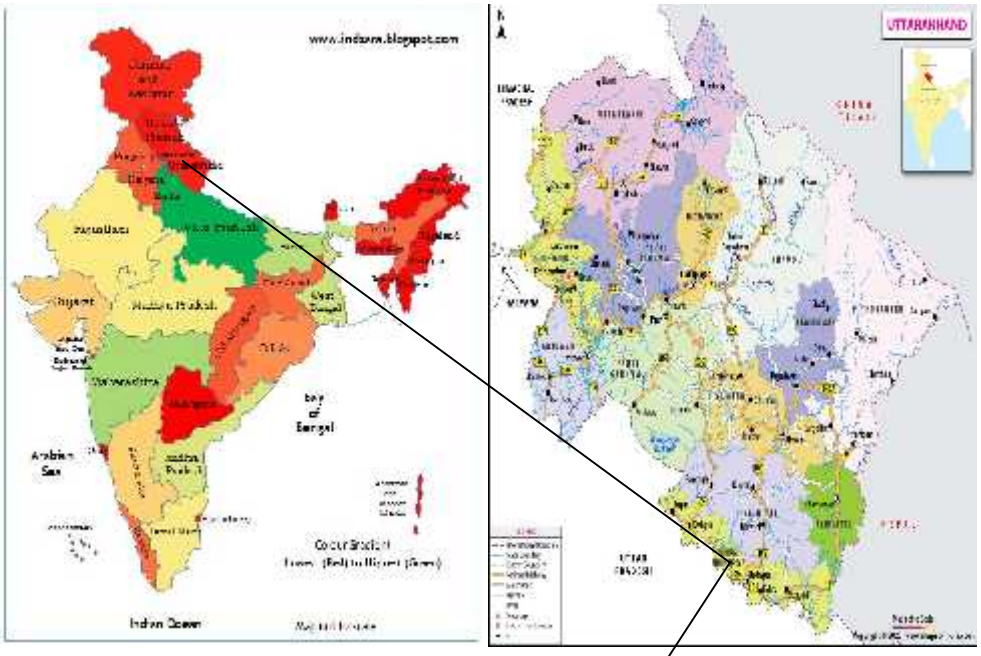
Brief details of the project are described in the Table No. 1.1 given below:

Table No.1.1:- Details of the Project

S.No.	Information	Details
1.	Project name	Meravarana Sand,Bajri & Boulder Mining Project
2.	Mining Lease Area	6.727 Ha.
3.	lease period	5 years
4.	Mining Plan period	5 Years
5.	Lease Details	The highest bidder was issued letter of intent (LOI) by state government vide letter no. 2457/VII-1/18/02(89)/2018 dated 20.12.2018 and after fresh demarcation revised letter of intent issued vide letter no. 1164/VII-A-1/2021/2(89)/18 dated 25th August 2021.

<table>
<tr><td>6.</td><td colspan="2">Location of mine</td></tr>
<tr><td></td><td>Village</td><td>Meravaran</td></tr>
<tr><td></td><td>Tehsil</td><td>Sitarganj</td></tr>
<tr><td></td><td>District :</td><td>Udham Singh Nagar</td></tr>
<tr><td></td><td>State :</td><td>Uttarakhand</td></tr>
<tr><td></td><td>Site Coordinates:</td><td>
<table>
<tr><th>Pillar Name</th><th>N</th><th>E</th></tr>
<tr><td>A</td><td>29^0 2’ 57.926”</td><td>79^0 41’ 25.139”</td></tr>
<tr><td>B</td><td>29^0 2’ 50.333”</td><td>79^0 41’ 28.170”</td></tr>
<tr><td>C</td><td>29^0 2’ 53.399”</td><td>79^0 41’ 36.603”</td></tr>
<tr><td>D</td><td>29^0 2’ 51.396”</td><td>79^0 41’ 36.902”</td></tr>
<tr><td>E</td><td>29^0 2’ 56.066”</td><td>79^0 41’ 37.565”</td></tr>
<tr><td>F</td><td>29^0 2’ 59.667”</td><td>79^0 41’ 35.229</td></tr>
</table>
</td></tr>
<tr><td>6.</td><td>Land Type</td><td>Government waste land</td></tr>
<tr><td>7.</td><td>Minerals of mine</td><td>River Bed Mineral</td></tr>
<tr><td>8.</td><td>Proposed Production</td><td>Maximum Production 242353 tonnes at the end of 5^{th} year.</td></tr>
<tr><td>9.</td><td>Bulk Density</td><td>2.2 Tones per m^3</td></tr>
<tr><td>10.</td><td>Method of mining</td><td>Opencast, Semi mechanized Method</td></tr>
<tr><td>11.</td><td>Drilling or Blasting</td><td>Not Required</td></tr>
<tr><td>12.</td><td>No of working days</td><td>240 days</td></tr>
<tr><td></td><td>Water demand</td><td>Drinking Water :0.1.44 KLD</td></tr>
<tr><td></td><td></td><td>Dust Suppression: 7.5 KLD</td></tr>
<tr><td></td><td></td><td>Plantation: 12 KLD</td></tr>
<tr><td></td><td></td><td>Other(if any): 1KLD</td></tr>
<tr><td></td><td></td><td>Total Water Requirement:21.94 KLD</td></tr>
<tr><td>13.</td><td>Man Power</td><td>96 Person</td></tr>
<tr><td>14.</td><td>Nearest railway station</td><td>Lal kuan Junction 17.1 km in W direction</td></tr>
<tr><td>15.</td><td>Nearest state highway/national</td><td>Sidcul road, 0.65 km in W</td></tr>
</table>

	highway	NH-74 about 15.67km in S SH-37 about 17.09 km in W
16.	Nearest air port	Pantnagar Airport 21.72 km in W Direction .
17.	Nearest Town, City, District Head Quarters along with distance in Kms	Nearest Town/District: Sitarganj 13.86 km in in S direction
18.	Ecological sensitive areas (Wild life Sanctuaries, National Parks, Biosphere Reserves, etc.)	Nandhaur Wildlife Sanctuary approx 9.0km towards North.
19.	Historical Places	None
20.	Financial & Social benefit	This Project will provide employment to local people directly and indirectly, which will improve their socioeconomic status.
21.	Proposed Project Cost	Rs. 1.41415 Crore
22.	Proposed CER Cost	Rs. 7.07 Lkahs
24.	EMP Expenditure	Rs. 20.625 lakhs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Arabian Sea
Bay of Bengal
Indian Ocean

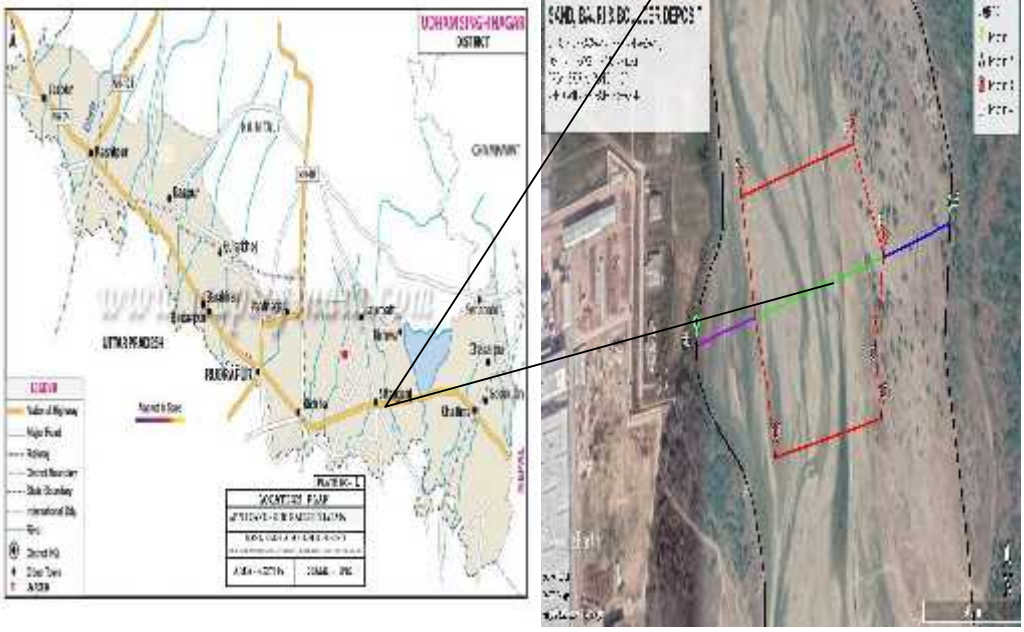
UDHAM SINGH NAGAR DISTRICT
LOCATION MAP

Figure-1.1 –Project Location

Figure -1.3 10 Km Buffer map of Study area

1.4 STATUS OF REGULATORY CLEARANCES OF THEPROJECT

Nandhaur Wildlife Sanctuary approx 9.0km towards North lies in 10km buffer zone.

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

1.5SCOPE OF THE STUDY

The application for prior Environmental Clearance (Form-1, PFR) for the proposed project was submitted. The SEIAA-SEAC-Uttrakhand prescribed the TOR. The Committee has issued Terms of Reference (ToR) for preparation of the DEIA report and Environmental Management Plan.

1.6 MINE DEVELOPMENT AND PRODUCTION

Proposed Method of Mining:

It shall be opencast semi-mechanized mine. Mining depth should be restricted upto 3.0m. The height of benches shall be kept 3.0mwith face slope 18deg & over all pit slope shall be maintained less than 16°. Mining shall be carried out without adoption of drilling & blasting.The working period for mining will be restricted to 240days (Eight months) & during three months of rainy season, no mining shall be undertaken.

The mining operations in the lease area would be confined day light hours from 7 a.m to 5 p.m. Due to scarcity of workers it is proposed that 30% of total RBM production shall be achieved manually while balance 70% of RBM production shall b achieved by machinery. It is proposed that light excavators will be used for digging & loading of mineral in tippers. Ultimate depth of pit shall be kept 3.0mfrom the surface.

Proposed Method of Mining:

The salient points of proposed methods of mining are as below.

1. Mining activity will be carried out by open cast semi-mechanized method.
2. Light weight excavators will be used for digging & loading of mineral in tippers.
3. No OB/Waste material will be produced.
4. Roads will be properly made and sprayed by water for suppression of dust.
5. Roads in the lease area for the movement of loaded trippers/trucks will not have slopes more than 1 in 20.
6. Extraction activities will start in the block from the upstream side to downstream side. This will not obstruct the movement of water, it any, during monsoon period in the river course.
7. Removal of material upto bed level is essential to control river flow in its central part to check the bank cutting.
8. Sustainable mining is extremely important to promote environment protection, hydrological & social effects. This should be carried out in following:

- To ensure adequate quantity of aggregation.
- To ensure there is no obstruction of river flow.
- To maintained the river equilibrium with the application of transport & quantity to be extracted.
- To avoid pollution of river water leading to water quality deterioration.

- The sustainable sand mining management guidelines (SSMMG)-2016 shall be strictly adhered.

Summary of geological reserves is as below:

Area of Minor Mineral Block (in hactares)	**Area of Minor Mineral Block (in Sq/m)**	**Area of buffer zone in minor mineral block (in Sq/m)**	**Total Quantity (MT)=Area x Depth x Bulk density (UNFC code 111) A**	**Quantity Block in buffer zone (UNFC code 211) B**	**Total Mineral Potential in the block A-B (UNFC code 111) (100%)**	**Mineable Mineral Potential in metric (tonnes) (60% of total mineral potential)in the block (UNFC code 111) (60%)**
6.727	67270	6070	443982	40062	403920	242352

Production Details

Production per year will be **242352 tonnes** which shall be achieved by the end of the 5 year.

Table-1.2-Year wise production detail

Year	**Production Rate (Tones)**	**Required Production %**
1st	242352	60
2nd	242352	60
3rd	242352	60
4th	242352	60
5th	242352	60

1.7LAND USE PATTERN

The area is Barren land (nonagricultural land). The existing land use of area is given below:

Sr. No.	Land use	Agriculture land (ha)	Forest Land (ha)	Waste land (ha)	Grazing Land (ha)
1	Mining pits Quarry	-	-	-	-
2	Approach Road	-	-	-	-
3	Dumps	-	-	-	-
4	Office, Resht Shelter etc.	-	-	-	-
5	Balance undisturbed land	-	-	6.727	-
	Total	**-**	**-**	**6.727**	**-**

1.8BASE LINE DATA

This section contains the description of baseline studies of the 10 km radius of the area surrounding proposed by Shr Rajesh Sharma for Meravarana Sand, Bajri & Boulder Mining Project located at khasra No-38&41,Village-Meravarana, Tehsil-Sitarganj,District: Udham Singh Nagar, State-Uttarakhand. Lease Area: 6.727Ha.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

Table 1.3BASELINE ENVIRONMENTAL STATUS

Attribute	Baseline status

Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of PM_{10} for all the 5 AQ monitoring stations were found to be 68.4µg/m^3 at AQ1 and 92.6µg/m^3 at AQ4, respectively. As far as the gaseous pollutants SO_2 and NO_2 are concerned, the prescribed CPCB limit of 80µg/m^3 for residential and rural areas has never surpassed at any station. The maximum & minimum concentrations of SO_2 were found to be 7.9µg/m^3 at AQ4 & AQ5 & 4.0 µg/m^3 at AQ1, respectively. The maximum & minimum concentrations of NO_2 were found to be 17.0µg/m^3 at AQ4 & 5.9µg/m^3 at AQ3 respectively.
Noise Levels	Noise monitoring reveals that the maximum & minimum noise levels at day time were recorded as 54.6 dB (A) at NQ2 & 50.3 dB (A) at NQ4, respectively. The maximum & minimum noise levels at night time were found to be 43.2 dB (A) at NQ2 Village & 39.4 dB (A) at NQ4.
Water Quality	**Ground Water** Analysis results of ground water reveal the following: - - pH varies from 7.48to 7.78 - Total hardness varies from 284 mg/l to 332mg/l - Total dissolved solids vary from 391 mg/l to 505 mg/l **Surface Water** The analysis results indicate that the pH ranges between 7.18 and 7.79. Dissolved Oxygen (DO) was observed in the range of 7.2 to 7.7 mg/l. BOD values were observed to be in the range of 3. The chlorides and Sulphates were found to be in the range of 20-32.0 mg/l and 6-8 mg/l respectively.
Soil Quality	Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 8.09 to 8.37, which shows that the soil is alkaline in nature. Potassium is found to be from 0.20

	meq/100 to 0.33 meq/100. The water holding capacity is found in between 22.67% to 26.86%.
Ecology and Biodiversity	No species was reported from the project area (Core Zone) which is listed under Schedule I of Wildlife Protection Act, 1972. However, there are many species which are reported to be present in the buffer zone. The project is not likely to affect the terrestrial species as it does not fall into habitat of above mentioned species. However, for species dependent on aquatic life, mine run-off might be an issue. Trees plantation will be proposed in subsequent chapters (under Environment Management Plan), which will eventually mitigate any adverse impact from run-off

1.9BIOLOGICAL ENVIRONMENT

Methodology for Floral & Faunal study:

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. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine, but also contributes in improvement of essential environmental attributes like air, water, soil, etc.

Udham Singh Nagar is Tarai region of Kumaon division. It was separated by district nainital on basis of its physiographical condition. The geographical area of the district is 3055km^2. The district lies between latitudes 28º53' and 29º23' N and longitudes 78º45' and 80º08' E

Drainage of the area is mainly controlled by Kailash River, Gola River, Dabka River, kosi, sharda River etc. and their tributaries (locally called Nadi, Gad or Gadhera).project site falls on River Kailash.

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 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).

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.

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 : Around the project site in 10 km radius

Core zone : At the project site

Buffer zone : Around the project site in 10 km radius.

General vegetation & Forest Type of the study area:

Area supports moderately healthy vegetation, the main forest species are scattered all over the hills, riparian vegetation found along the Kailash River and upper reaches of hills covered with pine forest.

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. 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 (*Mangiferaindica*), Jamun (*Syzygiumcumini*), Bail (*Aeglemarmelos*), Dakain (*Meliaazedarach*), Neem (*Azadirachtaindica*), Peepal (*Ficusreligiosa*), 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 from the rest of the areas. The common species grown near villages are mostly edible or useful plants such as *Mangiferaindica, Azadirachtaindica, Albizialebbeck, Delonixregia, Ficusreligiosa*, etc.

Fauna of the study area:

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 (*Naemorhedus 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 (*Corvussplendens*), Common Myna (*Acridotherestristis*)), Red-rumped Swallow (*Cecropisdaurica*), Hoopoe (*Upupaepopsceylonensis*) Warblers and Tits are of common occurrence.

Reptiles: The reptilians species commonly reported are Agama (*Laudakiatuberculata*) in settlement area, Garden lizard (*Calotesversicolor*) and *Eutropismacularia* 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 *Bufomelanostictus* (common Indian toad), *Euphlyctiscyanophlyctis* (Indian skipper frog),) etc.

1.10LAND ENVIRONMENT

Various components of land environment have been identified for study ofimpact of the mine operations. Details of the same are given below:

1.10.1 Solid waste generation and management

No solid waste generation is expected from the mining procedure. 96 persons including the works man and the administrative staff are supposed to produce negligible waste like gutka pouches, smoking litter,and newspapers etc. belonging to biodegradable category waste.Waste generated will be collected on regular basis and will be disposed as per the Municipal Solid WasteManagement (Management & Handling) Rule 2000 and its subsequent amendments.

1.10.2 Impact on land use & reclamation of mined out areas

The area likely to be degraded due to quarrying, pitting & roads:

The impact on the land form or Physiography will be limited to the modification of the slope.

i) Mine working will remain confined to river bed lot only & in no case disturbing any surface area outside which may affect topography or drainage.

ii) Mining pit will impact river bed topography by formation of excavation voids. This will be temporary & in first monsoon itself.

The impact on land use will also be limited. The various modifications due to mining allied & activities during plan period are given below:

Activity	**Area Occupied (Ha.)** **During next five years**	**At the end of conceptual period (ha)**
Mining and Existing pits	6.12	Nil
Waste dumps	0	Nil
Road	0	Nil
Area Replenished	6.12	Nil

Afforestation (outside the area)	2.0	Nil

Mitigation Measures:

- Unwanted material including mineral or spillage (if any) will not be stacked on the bank side as it will hinder the flow of water in monsoon season.
- The mining from river bed will not have any impact on natural drainage of surrounding area as the excavated sand from river bed is filled with first heavy flow in river during monsoon season.

1.11AIR ENVIRONMENT

Anticipated impacts and mitigation measures

It has already been explained that mining will be in a very small scale. One of the most crucial elements for air pollution is vehicular transport. Due limited movement tippers/tractor trolley air quality will not undergo any significant change.

However the only cause of concern in future will be SPM content. The daily average SPM will be less than 220 microgrammes per meter cube. Considering the Semi-mechanized operation for next five years, if safely believed that SPM content will seldom exceed 250 microgrammes per meter cube. However, if required, water sprinkling on dry month may be undertaken on the haul road where the maximum traffic will be observed.

- To control the emissions regular preventive maintenance of equipment will be carried out on contractual basis.
- Proper mitigation measures like water sprinkling will be adopted to control dust emissions.
- Plantation will be carried out on approach roads & nearby vicinity of river bank.
- It is being ensured that all transportation vehicles will carry a valid PUC certificate

1.12 WATER ENVIRONMENT

Mining causes lowering of riverbed level as well as river bed water level resulting in lowering of groundwater table due to excessive extraction and draining out of groundwater from the

adjacent areas, if general ground water table is higher than riverbed level. In case the general ground water level is lower than riverbed water level, then it will have positive impact as ground water table will be recharged vertically as well as laterally. The former case may cause shortage of water for the vegetation and human settlement in the vicinity, but in later case it will help improve situation.

River is recharging the ground water, excessive mining will reduce the thickness of the natural filter materials (sediments), infiltration through which the ground water is recharged, so restriction in depth becomes necessity.

Mitigation measures:

Mining in the area will be done well above the water table as well as river bed water level therefore; much impact on water regime is not anticipated. The water table is at 3-6 m below river bed level while the workings in the area are proposed up to a max. depth of 3.0mmining is proposed through the formation of two benches, so that water level is not touched. No waste water will be generated from the mining activity of minor minerals as the project only involves lifting of sand, Bajri& boulders from river bed.

1.13NOISE ENVIRONMENT

It has been explained earlier that proposed mining is of open cast semi mechanized with deployment of light excavator. Therefore noise level too will not show any significant increase.

The exposures to excessive noise levels can lead to:

a. Prevention of sleep, insomnia and fatigue.

b. Decrease in speech reception, communication, distraction and diminished concentration thus adversely affecting job performance efficiency.

c. Chronic psychological disturbance including impaired hearing.

d. Irreparable cardiovascular, respiratory and neuralgic damages in certain extreme cases.

The area is general represents calm surroundings. There is no heavy traffic, industry or noisy habitation in the area except the existing mine. The other major industry like minerals grinding and crusher plants is far away. With the increase in scale of mining operations, deployment of machinery and vehicles operation and men and noise levels are expected to increase.

Mitigation measures:

- Periodical monitoring of noise will be done.
- It is proposed that a light excavator (bucket capacity 0.50cum) shall be deployed for exploitation of RBM & loading the material from stackyard & noise generated by these equipments shall be intermittent and does not cause much adverse impact.
- Proper maintenance of all equipments/ machines will be carried out which help in reducing noise during operations.
- Plantation will be taken up along the approach roads and vicinity of river bank. The plantation minimizes propagation of noise and also arrests dust.

1.14 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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, emissions 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 environmental monitoring will be conducted in the mine operations as follows:

- Air quality;
- Water and wastewater quality;
- Noise levels;
- Soil Quality; and
- Greenbelt Development

1.15ENVIRONMENTAL MONITORING PROGRAMME

Table-1.5 Post Project Monitoring Programme

Attributes	Sampling	Measurement	Test Procedure

	Network	**Frequency**	**Method**	
A. Air Environment				
Pollutants PM 2.5, PM_{10}	5 locations in the project impact area (Minimum 2 Locations in upwind side, 2 sitesin Downwind side / impact zone and 1 in core zone)	Once in a season.	Gravimetric method	-
			Gravimetric method	-
SO_2			EPA Modified West & Geake method	Absorption in Potassium Tetra Chloromercurate followed by colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde (IS: 5182 Part - II).
NO_2			Arsenite modified Jacob Hochheiser	Absorption in dil. NaOH and then estimated calorimetrically with sulphanilamide and N (I-Nepthyle) Ethylene diamineDihydrochlorideand HydrogenPeroxide (CPCB Method).
B. Water Environment				
pH, Turbidity, Colour, Odour, Taste, TDS, Total Hardness, Calcium hardness, Magnesium hardness, Chloride, Fluoride, Sulphate, Nitrates, Alkalinity, Iron, Copper, Manganese, Mercury, Cadmium, Selenium, Arsenic, Cyanide, Lead, Zinc, Chromium, Aluminum, Boron, Phenolic Compounds	Set of grab samples during pre and post-monsoon for ground and surface Water in the vicinity.	Diurnal and Season wise	As per IS 10500	Samples for water quality should be collected and analyzed as per : IS : 2488 (Part 1-5) methods for sampling and testing of Industrial effluents Standard methods for examination of water and wastewater analysis published by American Public Health association.
C. Noise				
Noise levels at	Mine	Quarterly/	As per CPCB	As per CPCB norms

Day & night time - Leq dB (A)	Boundary High noise generating areas within the lease	Half yearly	norms	
D. Soil				
pH, Bulk Density, Soil texture,	3 locations in the project impact area	Yearly/ half yearly	As per USDA Method	As per USDA Method
Nitrogen, Available Phosphorus, Potassium, Calcium, Magnesium, Sodium, Electrical conductivity, Organic Matter, Chloride				
E. Socioeconomic				
Demographic structure Infrastructure resource base Economic resource base Health status: Morbidity pattern Cultural and Aesthetic attributes Education	Socioeconomic survey is based on proportionate, stratified and random sampling method	Minimum for two phases of the project	Primary	Secondary data from census records, statistical hard books, topo sheets, health Records and relevant official records available withGovt. Agencies

1.16BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Corporate Environment Responsibility:

CER (Corporate Environment Responsibility) details for the Project

Budget for Corporate Environmental Responsibility (CER)/Year

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

Rs. 1, 41, 41,500 x 0.05 = Rs. (7.07Lakhs)

Table No – 1.6 Budget allotted for CER

S. No.	Activity	Cost per Unit (Rs)	Quantity	Total (Rs.)
1.	Installation of Hand pump for nearby Villagers	40,000	05	2,00,000
2.	Installation of Solar street light in nearby Villages	14,000	10	1,40,000
3.	Construction of Toilets for Women in nearby villages	65,000	4	2,60,000
4.	Distribute Stationary nearby School			1,07,000
	Total Proposed CER Cost			**7,07000**

Table – 1.7 Estimated project cost along with analysis in terms of economic viability of the project.

S. No.	Description		Unit	Total (Rs.)
A. Project Operation Cost				
1.	**Manpower Cost:**		(Total Man power 96) Assuming 240days	93,48,000
	Mining Engineer (Part time)	1	Rs. 25,000/ month= 3,00,000	
	Geologist (Part time)	1	Rs. 35,000/ month= 4,20,000	
	Foreman (full time)	1	Rs. 500/ day= 1,20,000 x 1=1.20,000	
	Supervisor	6	Rs. 500/ day= 1,20,000 x 6=7.20,000	
	Office staff	2	Rs. 500/ day= 1,20,000 x 2=2,40,000	
	Un-skilled:			
	Piecerated workers	85	Rs.370 / day= 88800x85=75,48,000	
	Total	**96**		

2.	**Expenditure on Occupational Health:** PPE Kit, First Aid Facility, Mask, Hand wash & Sanitizer Medical checkup and Medicine (Once in a month)	3000/worker (3000 x 96)= 2,88,000 *Doctor's visit*: 10,000/ month (8 working months) =80,000 *Medicines* (Assuming 500/worker) 500 x 85 = 42,500 (Mine operation Month: 8) = 1,44,000	5,54,000
3.	**Equipment's/Tools/Machineries**	240 days Assuming Rs.5000/day	12,00,000
4.	**Drinking and Sanitary Facilities**	➢ Rs. 4000/day for drinking/domestic (240 days) ➢ Rs. 50,000/ Bio-toilets x 2	10,10,000
	Total Project Operation Cost (A)		**Rs. 1,20,79,000 (1.2079 Crore)**
B. Break-up of Expenditure on Environment Protection & Environment Management			
5.	Haulage Road Repair & Maintenance ⁾ Filling, Leveling and widening of the road up to width of 6m and length of 200 m. ⁾ Setting & Fixing of Cut Stone on the leveled road.	Annual 750 m (L) x 5 m (W)=3750m^2	4,00,000
6.	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	4,80,000
7.	Plantation along the road side & post plantation care	Plantation@100/sapling (6000 sapling) Post plantation care @500/day (For 60 Saplings Annually.i.e.365 days). ***Note: Annual cost will increase with increase in no. of sapling.***	6,00,000 1,82,500

8.	Environmental Monitoring & Compliances.	➢ **Half Yearly Monitoring of Environmental Parameters viz. Air, water, Noise & Soil.** ➢ Half Yearly Submission of Compliances.	4,00,000
	Total Environment Protection & Management Cost (B)		**Rs. 20,62,500 (20.625 Lakhs)**
	Total Project Cost (A+B)		**Rs. 1.2079 + 0.20625=1.41415 Crore**

1.17 ADDITIONAL STUDIES

Risk Assessment and Disaster Management Plan

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

Disaster Management Plan

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

1.18 PUBLIC CONSULTATION

Public Hearing

In consonance with the EIA notification dated 14th September 2006, vide section 1 (a) related to Public Hearing, the draft EIA/EMP report shall be submitted to the Uttrakhand Pollution Control Board (UKPCB) for public hearing.

1.19 PROJECT BENEFITS

The impact on the civic amenities will be substantial after the commencement of mining activities. Medical facilities will be provided in the form of first-aid facility at the mine.

These medical facilities will also be available to local people in the surrounding in case of emergencies.

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

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

1.20 CONCLUSION

- The mining operations will meet the compliance requirements of MoEF&CC;
- Community impacts will be beneficial, as the project will generate significant economic benefits for the region;
- Adoption of Best Available Technology and Best Management Practices with more environmental friendly process; and
- With the effective implementation of the Environment Management Plan (EMP) during the mining activities, the proposed project can proceed without any significant negative impact on environment.

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