# FINAL ENVIRONMENTAL IMPACT ASSESSMENT

# AND

# ENVIRONMENTAL MANAGEMENT PLAN

# OF

## Minor Minerals (RBM) Mining Project
## In Ferozpora Nallah Block -06,
## Kunzar Bridge to Bani Bridge, Downstream,
## District Baramulla, Jammu and Kashmir

| | |
|---|---|
| **PROPOSAL NO** | **SIA/JK/MIS/63730/2021** |
| **BLOCK NO** | **06** |
| **AREA** | **9.62 Ha** |
| **PRODUCTION** | **1,92,400 MTPA** |
| **LOCATION** | **Village- Kunzar, Tehsil: Tangmarg,**<br>**District: Baramulla, (Jammu & Kashmir)** |

## APPLICANT


**Mr. Ritamber Singh**

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## 1.0 PURPOSE OF THE REPORT

Environment Impact Assessment (EIA) is a process used to identify the environmental, social & economic impacts of a project prior to decision making. It aims to predict environmental impacts at an early stage of project planning & design, find ways & means to reduce adverse impacts. By using EIA, we can decide the suitable mitigation measures for implementation to maintain healthy working environment and contain pollution within permissible limits.

River plays an important role in the lives of the people. The river systems provide irrigation, potable water, transportation, electricity, and the livelihoods for a large number of people all over the country and to rural areas. Apart from this, river is also a good source of construction grade material as sand & gravel.

As transportation and construction infrastructure expanded since last few decades, the demand for construction grade sand also increased exponentially. The market demand of river sand is high throughout the nation. Sand is extracted directly from the river channel and it doesn't require processing other than size grading. But it is now well understood that continued and indiscriminate sand mining can cause serious environmental impacts, particularly if the river being mined is eroded.

Environmental Impact Assessment is one of the proven management tools for integrating environmental concerns in development process and for improved decision making as there is a need to harmonize the developmental activities with the environmental concerns into the larger interest of the society. The growing awareness, over the years, on environmental protection and sustainable development, has given further emphasis to the implementation of sound environmental management practices for mitigating adverse impacts from developmental activities. EIA study plays a vital role in sustainable development of a country. Recognizing its importance, the Ministry of Environment and Forest, Government of India had formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concern in project development.

The proposed project is of Minor Minerals (RBM) at Block No. 06, Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora over an area of 9.62 ha at Village- Kunzar, Tehsil- Tangmarg, District- Baramulla, UT Jammu & Kashmir. The project has been proposed by Mr. Ritamber Singh. Proposed project has been allotted to the proponent by State Government vide order no. 620/MCC/DGM/EAB/20/829-35 Dated: 12/06/2020 and is further extended vide Govt. Order no. 26-MNG of 2020 dated 31.08.2021. Mining plan has been approved vide letter no. 04-MPA/DGM/Bla/3313-17 dated 17.05.2021.The Project falling under category "B1".

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Jammu & Kashmir under EIA notification of the MoEF & CC dated 14th September, 2006 and its subsequent amendment there-off and also the EIA Guidance Manual for Mining of Minerals of MoEF & CC, Govt. of India, for seeking environmental clearance for mining of Sand in the applied mining lease area.

## 1.1 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The project is proposed to sand mining in an area of 9.62 hectares. The Mining sites are situated at Block No - 06 at Village- Kunzar, Tehsil- Tangmarg, District: Baramulla (Jammu & Kashmir).

**Identification of Project proponent**

Mr. Ritamber Singh

S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil

Ramgarh, District Samba, UT- Jammu and Kashmir

| Location | Area (Ha) | Production | Letter of Intent |
|---|---|---|---|
| Village- Kunzar, Tehsil- Tangmarg, District: Baramulla (Jammu & Kashmir) | 9.62 | 1,92,400 MTPA | 620/MCC/DGM/EAB/20/829-35 Dated: 12/06/2020 and is extended vide Govt. Order no. 26-MNG of 2020 dated 31.08.2021. |

**1. Block No. 06**

Mr. Ritamber Singh

S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil

Ramgarh, District Samba, UT- Jammu and Kashmir

The above Block have an area of 9.62 ha, ToR was issued by JKEIAA vide letter no. JKEIAA/2021/587/4512-16 Dated 26.11.2021.

**Status of the Block**

The above Block have an area in 9.62 ha, and lies in the River Bed of Nallah Ferozpora.

**Table- 1.1, TOR detail**

| S.no | Block No | Vide Letter No | TOR date |
|---|---|---|---|
| 1 | **Block No. 06** | JKEIAA/2021/587/4512-16 | 26.11.2021 |

## 1.2 BRIEF DESCRIPTION OF PROJECT

The proposed project is open cast semi-mechanized mining/OTFM of sand (mineral mineral) with a proposed production of 1,92,400 MT per annum.

Plot wise area & production details are given below:

**Table- 1.2, Area & production details**

| S.no | Lessee | Area (ha) | Proposed Capacity (TPA) |
|---|---|---|---|
| 1 | **Block No. 06**<br>Mr. Ritamber Singh<br>S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil - Ramgarh, District Samba, UT- Jammu and Kashmir | 9.62 | 1,92,400 MTPA |

As per the EIA notification of the MoEF dated 14th September, 2006 as amended on 1st December 2009, 4th April, 2011, 13th December 2012, 13th March 2013, 9th September 2013, 28th February 2014 and 25th June 2014, the proposed mining project is categorized as category 'B1' project. The EIA-EMP report is prepared as per the ToR granted under the EIA Notification 2006 & its amendments thereof. Further to assess the impact on environment due to proposed mine, it is necessary to ascertain present status of environment prevailing at the project site and proposed operation including identification and Assessment of impact on the environment.

**Table: 1.3, Project cost**

| S No. | Cost Head | Cost (In Lakhs ) |
|---|---|---|
| 1 | Bidding cost | 72.0 |
| 2 | Environment Clearance processing cost | 0.40 |
| 3 | Public Hearing fees | 3.50 |
| 4 | Consultancy Fees | 4.00 |
| 5 | Labor And Machinery Cost | 81.0 |
| 6 | Infrastructure Cost (Rooms, shelter etc.) | 5.0 |
| 7 | Pollution Consent Fees | 0.4 |
| 8 | EMP Capital cost | 22.0 |
| 9 | EMP recurring cost | 38.0 |
| 10 | CER cost | 3.4 |
| **Total** | | **229.7 Lakhs** |

The mine lease co-ordinates and connectivity details are listed below:

**Table 1.3 (a): CER Cost for Block no. 06**

| S. No | Project activities | Activities | Annual Budget Proposed by Proponent (in lacs) | Remarks |
|---|---|---|---|---|
| **1** | Health | Free Distribution of medicines, health check-up Installation of hand pumps/ Distribution of sanitizer's, gloves & N95 masks to nearby village | 2.00 | |
| **2** | Drinking water facility | Drinking water facility in nearby village/ Installation of hand pumps panchayat/ Installation of hand pumps | 0.00 | |
| **3** | Electrification | Solar Lamp distribution & Solar street light installation | 0.00 | |
| **4** | Sanitation | Construction of ladies' toilets in the village. | 1.40 | |
| **5** | Education | Distribution of school bags & books in nearby Primary School Education Grants to | 0.00 | |

| | | | | |
|---|---|---|---|---|
| | | girl child to check drop outs in schools. | | |
| **TOTAL** | | | **3.40** | |

**Table 1.3 (b), Budget of EMP for Block No.06**

| S. No | Proposed actions | EMP budget (in lacs) | |
|---|---|---|---|
| | | Capital | Recurring |
| 1 | Green belt development | 6.00 | 4.00 |
| 2 | Haulage route maintenance | 4.00 | 3.00 |
| 3 | Env. Awareness programme | 1.0 | 1.0 |
| 4 | Pollution monitoring | 2.00 | 2.00 |
| 5 | Dust suppression | 2.00 | 2.00 |
| 6 | Occupational Health & Safety of mine workers | 1.00 | 2.00 |
| 7 | Installation of Hume pipes | 6.00 | 5.00 |
| | **Total** | **22.0** | **19.0** |

**Table: 1.3 (c) Budget for Surveillance**

| S no. | Particulars | Capital Cost (In Lakhs) | Recurring Cost (In Lakhs) | Remarks |
|---|---|---|---|---|
| **1.** | Transport Permit | 2.0 | - | - |
| **2.** | CCTV Camera | 1.0 | 0.10 | |
| **3.** | Weight Bridge | 10.00 | 1.00 | |
| **4.** | Personal Computer with power backup | 0.50 | 0.05 | |
| **5.** | Mobile Application Barcode scanner | 0.50 | 0.05 | |
| **6.** | Radio Frequency Identification Tag(RFID) and GPS | 1.00 | 0.10 | |
| **7.** | Annual Audit of lease | - | 0.70 | |
| **8.** | Security Guard | - | 0.80 | |
| **Total** | | **15.00** | **2.80** | |

**Table: 1.4, Mine lease Pillar Co-ordinates for mines/site surrounding**

| | | | | |
|---|---|---|---|---|
| Coordinates | **Block No.** | **Points** | **Latitude(N)** | **Longitude(E)** |
| | Block No. 06 | A | 34°05'17.18" | 74°30'40.14" |
| | | B | 34°05'28.20" | 74°30'50.82" |
| | | C | 34°05'33.58" | 74°30'58.91" |
| | | D | 34°05'43.75" | 74°31'06.64" |
| | | E | 34°05'45.85" | 74°31'04.31" |
| | | F | 34°05'27.65" | 74°30'46.84" |
| | | G | 34°05'19.35" | 74°31'37.84" |
| Nearest Railway Station | Pattan Railway Station about 8.80 km NE from the lease area. | | | |
| Nearest Airport | Sheikh Ul Alam International Airport Srinagar at a distance of about 25.00 km ESE from the lease area. | | | |
| Nearest Highway | National Highway 1-A which is approx. 14.50km from the mine site in NE direction. | | | |
| State, National boundaries. | No Interstate Boundary exists near the lease area. | | | |

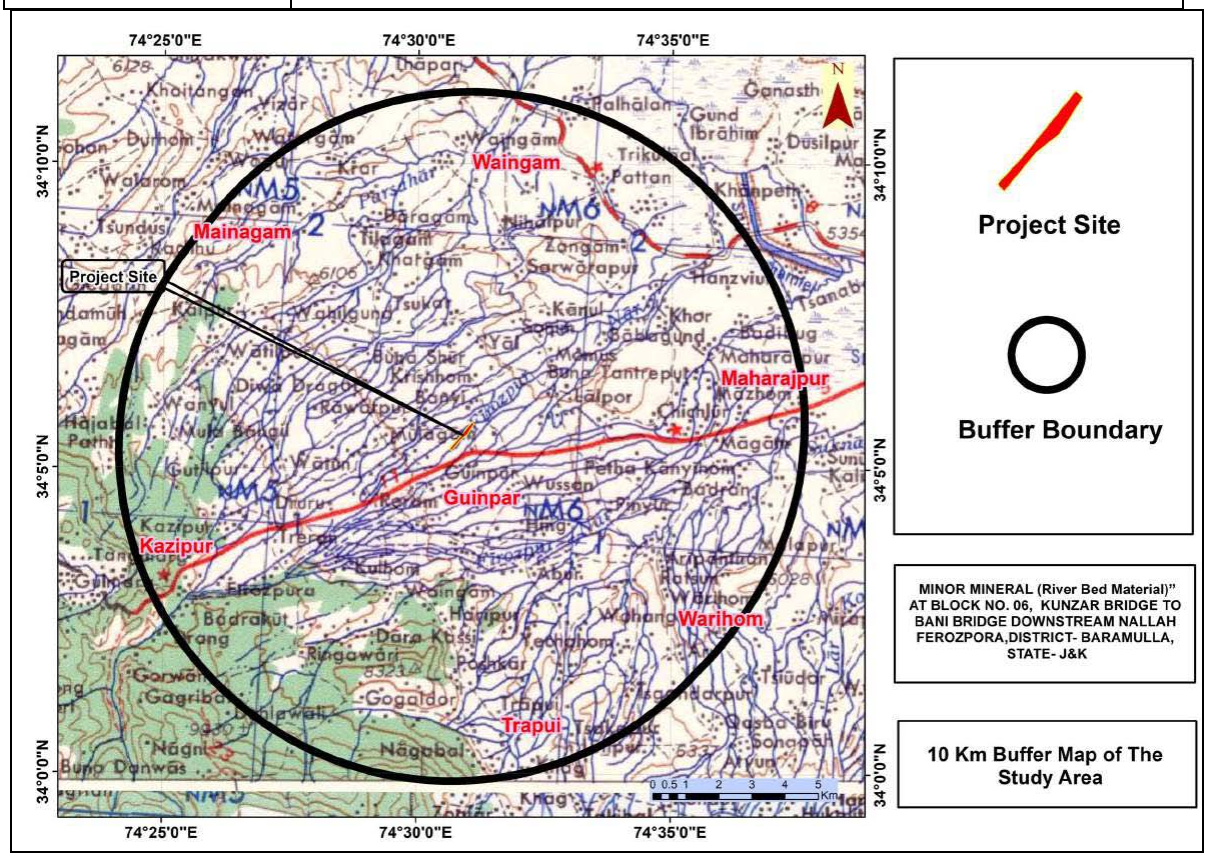


**Figure 1.1, 10 km composite buffer map**

**Table: 1.5, Details of environmental settings**

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Elevation</td><td><table><tr><th>S.N</th><th>Block No</th><th>Elevation</th></tr><tr><td>1</td><td>Block No. 06</td><td>1720 m to 1760 m</td></tr></table></td></tr>
<tr><td>2</td><td>Ecological Sensitive Areas (National Park, Wildlife Sanctuaries)</td><td>None</td></tr>
<tr><td>3</td><td>Nearest water body</td><td>The mine site lies on the downstream river bed of Nallah Ferozpora District Baramulla</td></tr>
<tr><td>4</td><td>Seismic Zone</td><td>Area is susceptible to Earthquake. Project area falls in Zone-IV High Damage Risk Zone.</td></tr>
</table>

The EIA-EMP report is prepared as per the TOR granted under the EIA Notification. In order to assess the impact on environment due to proposed mine, it is necessary to ascertain present status of environment prevailing at the project site and identification and assessment of impacts on the environment of the proposed operation.

### 1.2.1 Project's importance to the country and the region

Sands are ubiquitous material; available everywhere and is being used from the time immemorial for wide applications in our daily life; infrastructures, building construction, highways, roads, townships, multiplexes, foundations of buildings and industrial units etc. and is an integral part of development. Life without sand is unthinkable. Over the millennia, the weathering effect, the flow of water at high velocities in rivers and the pressure of water from the high mountainous reservoirs converted and pushed the hard ground underneath into sand, etc. which travelled as sediments with the flow. This sand got deposited along the river course wherever conditions were favorable. In the deep past this settled sand was not extracted in a quantity in which it deposited; since due to less population the requirements was not enough. As a result of continuous deposit of sand , the rivers went on changing their course, widening by itself, eroding the fields and expanding, resulting in flooding, inundation and breaking their banks, causing devastation

of property and loss of life. There has been a severe impact on every aspect of the environment. The rivers thus, needed channelization and therefore, extraction of these minor minerals through mining was expedient. The haphazard mining of sands being practiced now for long, through unregulated, uncontrolled and illegal way added almost an irreversible damage to the environment, which became a cause of serious concern to everyone. Though sands are very important mineral source for development, its mining through scientific methods has also become equally imperative.

It is for this purpose that 'mining plan' is being drawn so that all its aspects are taken care of justifiably, according to law, protecting the environment, removing all adverse impacts and creating a direct and indirect employment opportunities, improving socio-economic conditions of the local inhabitants and all-around status of life, achieving thereby a sustainable development.

Besides the above, the process of mining of minor minerals (Sand) is a constant source of revenue generation to the State Government through Royalty.

## 1.3 SCOPE OF THE STUDY

The project proposal was submitted to State Level Environment Impact Assessment Authority-J & K for its appraisal. Based on which, presentation was held for Terms of Reference (TOR). Based on the data provided and presentation made, the SEIAA- J &K has issued the Terms of Reference.

Followings are the point wise compliance of the ToR provided by the SEIAA- J &K.

**Table: 1.6, Point wise compliance for TOR (For Block No. 06)**

| S. No | TOR | Compliance | Reference in the Report |
|---|---|---|---|
| 1 | Year-wise production details should be given, clearly stating the highest production achieved in any one year. | This is fresh LOI, Mine is yet to be opened. It will open only after getting environmental clearance. | -- |

| | | | |
|---|---|---|---|
| 2 | A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given. | State Govt. has given consent for mining vide letter no. 620/MCC/DGM/EAB/20/829-35 Dated: 12/06/2020 and is further extended vide Govt. Order no. 26-MNG of 2020 dated 31.08.2021 on the name of Mr. Ritamber Singh for block 6. | **Annexure II, LOI** |
| 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 and mining technology and should be in the name of the lessee. | The documents including mine plan and EIA report submitted are compatible with one another w.r.t. to following information:<br>Mining Lease Area- 9.62 Hectare.<br>Lessee:<br>Project proponent- Mr. Ritamber Singh<br>Proposed Production- 1,92,400 MTPA<br>Waste generation-No waste will be generated.<br>Mining Method-Opencast semi-mechanized method<br><br>Public hearing has been conducted dated 17-03-2022 at Town Hall Municipal Committee, Kunzer Tanmarg, District- Baramulla. J & K. | **Annexure- III**<br>Mine plan<br>All details has been complied in chapter-2<br><br>**Annexure-XII**<br>Public hearing minutes |
| 4 | All corner coordinates of the | All Corner Coordinates of | Refer Chapter 2 |

| | | | |
|---|---|---|---|
| | 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). | mining lease area superimposed on Toposheet Map has been incorporated in EIA/EMP Report | Fig: 2.1, 2.2 Corner Coordinates map |
| 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. | The land use map showing salient features of the area is given in the report.<br>The geological map of the mine lease area is also given in the report showing geomorphology | Land-use of the study area Figure 3.1. |
| 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 Lease area is dry part of River bed/nalla. This is a barren land.<br>The mining process will be done by land use policy of the State & no land diversion has been proposed. | Chapter II & III |
| 7 | It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by | Yes, the proponent Company has a well laid down Environment Policy. The hierarchical system or | Chapter VIII Section 8.1 Corporate Environment |

| | | | |
|---|---|---|---|
| | its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating processes /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 insuring compliances 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. | administrative order of the company has been given in the EIA report. | Policy |
| 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. | This is an opencast sand mining project & face slope of the area is 40º. Mining will be done by opencast semi mechanized method without adoption of drilling & blasting.<br><br>Safety measures to be taken during mining has been detailed in the EIA report. | |
| 9 | The study area will comprise of | The 10 km zone from | Chapter I |

| | | | |
|---|---|---|---|
| | l0 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 mine/lease period. | periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report.<br>All the details in the EIA report are for the life of the mine period.<br>The details of mining & production have been given in the report. | Figure 1.1 |
| 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. | Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated with the report. The study area lies in Nallah Ferozpora.<br>There is no wildlife sanctuary or national park within the study area. | Land-use of the study area Figure 3.1 , Table 3.1<br><br>10 km buffer map enclosed in Chapter I of EIA Report. |
| 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. | The proposed project lies on Nallah Ferozpora and as such there is no over burden. No top-soil will be produced as waste material.<br>There is no requirement of | |

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| | | R& R Plan as it is a river bed sand mining project. | |
| 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 Committee's. | There is no forest land within the lease area. | --- |
| 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. | No forest land is involved in the lease area, therefore, deposition of net present value (NPV) and compensated Afforestation is not indicated. | |
| 14 | Implementation status of reorganization of forest rights | There is no forest land involved in the leased out | |

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| | under the schedule tribes and other traditional forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated. | area. Hence, this act is not applicable for this project. | |
| 15 | The vegetation in the RF / PF areas in the study area, with necessary details, should be given. | No RF/PF is present within the 10 km radius of the lease area. However, the vegetation details of the study area are incorporated with the report. | Chapter III Section 3.1.6 Biological Environment |
| 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. | The details Impacts & there mitigation measures are given in chapter IV of EIA/EMP Report. | Chapter IV |
| 17 | Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed), if any, within l0 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 | No National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed) are found within 10 km of the study area.<br><br>MAP showing eco sensitive zone is attached in Chapter III (Fig 3.4) | Chapter III Biological Environment |

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| | 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 along with 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. | Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease has been carried out for the project. The same has been incorporated in the report. | Chapter III<br><br>Biological Environment |
| 19 | Proximity to Areas declared as 'Critically Polluted' or the Project areas attracting court | Proposed project does not come under critically polluted area. | |

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| | restrictions for mining operations, should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered. | | |
| 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 | There is no R & R involved in this project. | |

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| | 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 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 | Base line study was carried out for pre monsoon season March to May, 2021 Details are provided in EIA/EMP Report.<br>The locations of the monitoring stations were decided on the basis of prevailing meteorological conditions (Wind direction & wind speed) of the study area.<br>The wind rose has been given in chapter III of EIA/EMP Report. One location has been selected in downwind direction within 500 m from the lease boundary.<br><br>The location of the monitoring sites has been shown in map. | Chapter III |

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| | 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. 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. | Air quality modeling has been given in Chapter 4. | Chapter 4 |
| 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. | The water requirement for the both project is 4.0 KLD for drinking, dust suppression and green belt development.<br>A detailed water balance is being provided in the report. | Chapter –II Section 2.7.4 table 2.10 Water Requirement |
| 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. | Detail has been given in Chapter II |
| 25 | Description of water conservation measures proposed | The project do not consume any process water except for | Chapter –II Section 2.7.4 |

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| | to be adopted in the Project should be given. Details of rainwater harvesting proposed in the project, if any, should be provided. | drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of ground water.<br>No artificial rainwater harvesting is proposed for the present project in lease area, however if any such project proposed by State Government PP will help out for the above. | table 2.8 Water Requirement |
| 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 activity will be done on Dry Bed of River so there is no impact on surface water.<br>Mining will be up to 1 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table. | Detail has been given in Chapter II |
| 27 | Based on actual monitoring 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 | Mining will be up to 1 m below ground level or above the ground water table whichever comes first. This will not intersect the ground water table.<br>Therefore, Hydro geological Report will not be required for this project. | Detail has been given in chapter III. |

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| | 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. | The Mining site is situated at Block No. 06 (Area 9.62 ha.), Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora, District Baramulla, Jammu and Kashmir. No diversion is proposed. | A drainage map has been given in chapter II of the report. |
| 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. | The highest elevation of Block no. 6 is 1760 m mRL and lowest elevation is 1720 m. Mining will be up to 1m below ground level or above the ground water table whichever comes first. | Detail has been given in Chapter II |
| 30 | A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and Quantities coverage, plant species and time frame) and Submitted keeping in mind the same will have to be executed up front on commencement of the | Plantation/afforestation will be done as per program i.e along the road sides and near civic amenities, as per mine plan. Post plantation, the area will be regularly monitored in every season for evaluation of success rate.<br>List of Plant species selected | Detail has been given in Chapter VIII, Section 8.2. |

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| | 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. | for green belt is detailed in the EIA report.<br>The plant species selected for green belt have a greater ecological value and are of good utility value to the local population. The plant species are selected by giving 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 | There will be about 108 trucks carrying the minerals per day. The projection has been done based on the mineral transportation.<br>The details of traffic analysis are discussed in the report. | Detail has been given in Chapter IV Section 4.6 Traffic Analysis<br>Fig 4.2, Table 4.2(i), 4.2(ii) |

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| | 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 | A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipments, etc. Details are given in the EIA/EMP Report. | Detail has been given in Chapter II Section 2.12.2 |
| 33 | Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate numbers of sections) should be given in the EIA report. | Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures for air pollution control have been given in the report, discussed in Chapter-4.<br><br>Each labour will undergo pre-placement medical examination. Thereafter periodical heath check up will be arranged as stated in the report. About 2.0 lakh has been earmarked for Occupational health. | |
| 34 | Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical | Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement of vehicles. | Detail has been given in Chapter VII Section 7.2 |

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| | 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. | However appropriate mitigation measures for air pollution control have been given in the report, discussed in Chapter-4.<br>Each labour will undergo pre-placement medical examination. Thereafter periodical heath check up will be arranged as stated in the report. About 2.0 lakh has been earmarked for occupational health. | Detail has been given in Chapter VIII, Section 8.3 |
| 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. | The proposed project being a small scale semi-mechanized mining project, there will be hardly any process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation. Budgetary allocation is given in Chapter-VIII. | Detail has been given in Chapter VII, Section 7.2 |
| 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 to time for implementation. | Socio-economic significance provided to the local community i.e. to the nearby villagers is given in the EIA/EMP Report. | Detail has been given in Chapter VI, Section 6.4<br>Detail has been given in Chapter VII, Section 7.2 |

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| 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. | The detailed environmental management plan to mitigate the environmental impacts has been mentioned in of the EIA/EMP Report. | Detail has been given in Chapter X. |
| 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. | Public hearing has been conducted dated 17-03-2022 at Town Hall Municipal Committee, Kunzer Tanmarg, District- Baramulla. J & K. | **Annexure-XII** Public hearing minutes Public Hearing points raised and commitment of the Project Proponent on the same has been given in table 7.2 of chapter 7. |
| 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 is pending against the project. | |
| 40 | The cost of the Project (capital cost and recurring cost) as well as the cost towards | The capital cost is 22.0 lakh & 19.0 lakh as recurring cost for EMP of Block 6. | Detail has been given in Chapter X. |

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| | implementation of EMP should be clearly spelt out. | | |
| 41 | A Disaster management Plan shall be prepared and included in the EIA/EMP Report". | A Disaster management Plan has been given in EIA report. | Detail has been given in Chapter VI. |
| 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. | 2% of the total cost of the project has been earmarked towards the Enterprise Social Commitment which will be used for the development of village. | Detail has been given in Chapter VIII. |
| **43** | **Besides the above, the below mentioned general points are also to be followed:-** | | |
| a | Executive Summary of the EIA/EMP Report. | Attached. | |
| b | All documents to be properly referenced with index and continuous page numberings. | Compiled With EIA report. | |
| 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. | Compiled With EIA report. | |
| 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. | Compiled With EIA report. | |
| e | Where the documents provided | Compiled With EIA report. | |

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| | 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. | Compiled With EIA report. | |
| g | While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF 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. | Compiled With EIA report. | |
| 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. | Agreed | |

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| 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 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. | Compiled With EIA report. | |

## SPECIFIC TOR COMPLIANCE

| | **Conditions** | **Reply** |
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| **1** | To submit a detailed site **appreciation note / Executive Summary** supported with a video photographs, describing in detail the physical features of the mining site and structures viz. bridges, canal headworks, Zamindari Khuls if any existing within a reach of 500mts. from the downstream and the upstream ends of the mining block. The | Has been attached in **annexure X**. |

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| | appreciation note will also describe the environmental settings i.e. agricultural lands if any located on the two banks, green patches in close vicinity of the mining block. The site appreciation note shall form an integral part of the EIA report as per decision of JKEIAA taken in its 38th meeting. | |
| **2** | Before conducting Public Hearing, the G & M Dept. shall temporarily mark the boundaries of the mining block in consultation with the concerned Revenue Authority and the JKPCB so that locals know during the public Hearing where where the mining block is located on ground as per decision of JKEIAA taken in its 38th meeting. | Agreed |
| **3** | A comprehensive chapter be included in the EIA report on Cost Benefit Analysis of the mining activity in the mining block underlining the environmental and social costs. | Has been included in **Chapter 9.** |
| **4** | Impact of mining activity on adjacent agricultural land with particular reference to run off, soil erosion and top soil loss due to change in topography. | The mine site is located on river bed. During mining, the sand may be deposited on the adjacent agricultural land which may affect the fertility. To prevent this Water sprinkling will be done on the haul roads twice in a day & Periodic soil quality monitoring will be done to assess the quality and for timely corrective actions |
| **5** | Details of Gradient of river bed and 3-D view draped on the satellite image. | 3-D map will be shown at the time of presentation. |

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| **6** | Details of excavation schedule & sequential mining plan with a maximum mine depth of 1mtr. | Mining will be done by opencast semi mechanized semi mechanized/ manual method. Mining will be done by forming block from the upstream to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.<br>Approved mining plan has been attached as A**nnexure III.** |
| **7** | Details of transportation of mined out materials with respect to axle load specified for the road as per the Indian Road congress for the ways (loaded as well as unloaded trucks) load and its impact on the environment. | Traffic study has been done as per the Indian Road congress & given in **Chapter 4.**<br>Transportation route map has been shown as fig no- 4.1 in **Chapter 4.** |
| **8** | Impact on mining activity on the existing land use in the study area. | The proposed project is for extraction of stream bed materials. There will be no major changes in existing land use as excavated pits will get replenished annually in monsoon itself & will be restored to original. Detail has been given in **Chapter 4.** |
| **9** | Impact on mining on aquatic life. | There is no existence of breeding ground of species like fishes; turtles etc. so there will be not much impact on aquatic life in the area.<br>However, following impact may occur-<br>• In-stream mining lowers the stream bottom, which may lead to bank erosion. Degraded stream habitats result in loss of fisheries productivity, biodiversity, and |

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| | | recreational potential.<br>• Mining on the streambed may hinder the movement/migration of fishes.<br>As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize |
| **10** | NOCs from HoD/competed authority of Irrigation and Flood Control Dept. and Fisheries Dept. or as specifically asked for in minutes of meeting should be obtained and submitted while applying for EC. | NOCs has been attached as **Annexure IV.** |
| **11** | The quantification of river bed material be based on Excavation only upto a **maximum depth of 1m** in the riverbed or 1m above water table whichever comes first to safeguard ecological conditions in view of non-availability of replenishment data in DSR. | The digging depth will be restricted upto 1 m only until replenishment study has not done. Production at 1m depth has been given in Section 2.5 of Chapter 2. |
| **12** | A digitalized surface plan showing coordinates, physical measurements, river gradient and inter-cross sections at different intervals should be a mandatory part of mining plan. | Hs been given in EIA report. |
| **13** | Specific measures to be undertaken to mitigate the impact of mining activity on the habitat and migration of fish in the river/stream and concurrence thereof from the Fisheries Department. | As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the |

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| | | species.<br>Detail has been given in **Chapter 4.** |
| **14** | The Photography and videography of the mining block shall be part of the Term of Reference. | Has been done & site photograpgs has been attached as **Annexure- XI.** |
| **15** | The maps shall be submitted on a scale 1:3000 and 1:1500 within 10 kms. Radius. | Has been given in EIA report. |
| **16** | The shortest extraction route leading to the main road but with minimum interference with human settlements should be identified and described in detail. This along with the map and its KML file be part of an exclusive chapter in the EMP with adequate budget. | Transportation route is away from human settlement. Route map has been shown in **Chapter 4.** |
| **17** | Dust suppression measures should be prescribed in the EIA/EMP with adequate budget. | Water sprinkling will be done on regular basis to Dust particles. Beside this plantation will also be done along haul road. |
| **18** | Post project monitoring plan should be included in the study. | Has been included in **Chapter 6.** |
| **19** | Occupational health impacts should be assessed and plan for implementation of COVID- 19 SOPs in the mining activity should be detailed. | Budget for mask, gloves & sanitizer distribution has been allocated in CER budget for COVID in table 8.3, Chapter 8. |
| **20** | The Consultant while presenting field data in the EIA report should ensure that the site specific date-wise datasheets duly attested by the local panchayat head with his name, signatures and stamp and attested by District Mineral Officer with seal and signature are included in the EIA report. | Lab report has been attached as **Annexure XIV.** |

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| **21** | The data displayed on air quality monitoring stations should be captured with digital camera displaying the date on the photograph so captured and same should be submitted in support of the date-wise data sheets. These digital photographs should be submitted in soft as well as appended with the EIA report. In case, the consultant uses manual system to evacuate the PM10 level on replacing 8" * 10" size filter paper after 8 hr duration, the photographs of its timer display which reveals the actual operating time of machine, should be included in the EIA report. | Has been done. |
| **22** | The impact of mining activity on the neighboring villages needs to be studied and extraction road need to be such that it has least crossing through village settlements. | Noted. Detailed impact analysis has been given in chapter 4. |
| **23** | Mining shall be proposed manually minimally supported by semi-mechanized methods excluding heavy machinery like JBC or L&T hydraulic excavators etc. | Agreed |
| **24** | The prescribed TORs would be valid for a four year for submission of the EIA/EMP reports, as pr the S.O No. 751(E) dated 17th Feb. 2020. | Agreed |

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## 2.0 TYPE OF PROJECT

The project is proposed for the Minor Minerals (RBM) at Block No. 06, Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora, District-Baramulla. The proposed project is open-cast mining project.

## 2.1 NEED FOR THE PROJECT

The Project is a mining lease for River bed mine that should be used for infrastructure development. The material is used for building construction and road construction. The sediment in the form of river bed material (RBM) deposited in the last many years had changed the shape of the bed from a valley to a raised land. Hence, it is necessary to remove the materials so that the stream gets channelized. Due to rapid infrastructure development in India, the demand of construction material has increased. To supply this demand, mining of river bed material is done. The impact due to mining on the socio-economic front will be beneficial. About 12 people will directly benefited by mining through employment. With continuation of mining, other infrastructural developments will increase the socio-economic status of the local inhabitants.

## 2.2 LOCATION DETAILS

The mining area is located at Block No. 06, Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora, District-Baramulla, Jammu & Kashmir. The lease co-ordinates and other Details are listed below:

**Table 2.1, Mine lease co-ordinates/Details**

| Block No. | Points | Latitude(N) | Longitude(E) |
|---|---|---|---|
| Block No. 06 | A | 34°05’17.18” | 74°30’40.14” |
| | B | 34°05’28.20” | 74°30’50.82” |
| | C | 34°05’33.58” | 74°30’58.91” |
| | D | 34°05’43.75” | 74°31’06.64” |
| | E | 34°05’45.85” | 74°31’04.31” |
| | F | 34°05’27.65” | 74°30’46.84” |
| | G | 34°05’19.35” | 74°31’37.84” |

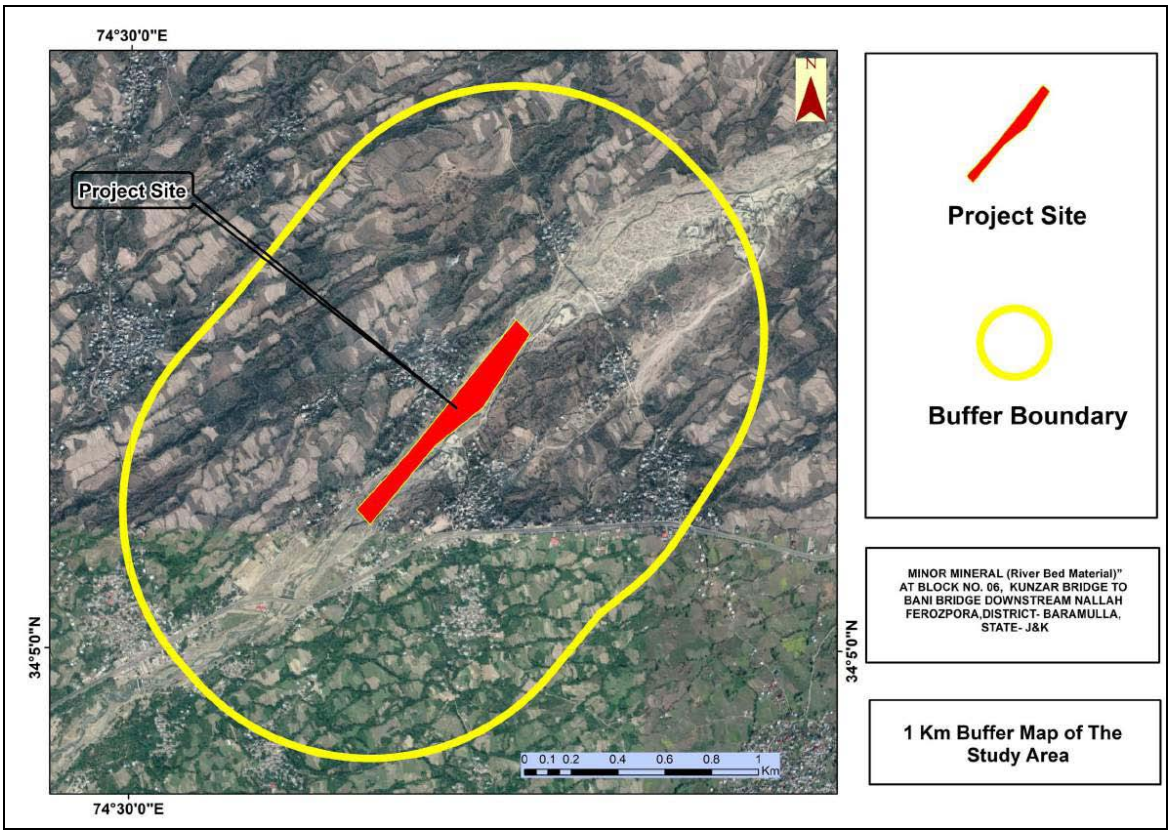


**Figure 2.1:- 1 km buffer map (Block 06)**

### 2.2.1 Lease / Block Area

The entire lease hold area of 9.62 ha, and lies at the River Bed of Nallah Ferozpora.

| S.no | Lessee | Block No | Area (ha) | Proposed Capacity (TPA) |
|---|---|---|---|---|
| 1 | Mr. Ritamber Singh S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil - Ramgarh, District Samba, UT- Jammu and Kashmir. | 06 | 9.62 | 1,92,400 MTPA |
| **Total** | | | **9.62ha** | **1,92,400 MTPA** |

**1 Block No. 06,**

Mr. Ritamber Singh

S/O Sh. Prahlad Singh R/O Chak Shaman,

Tehsil - Ramgarh, District Samba, UT- Jammu and Kashmir

The above Block have an area of 9.62 ha, ToR was issued by JKEIAA vide letter no. JKE JKEIAA/2021/587/4512-16 Dated 26.11.2021.

## 2.3 TOPOGRAPHY & GEOLOGY

### 2.3.1 Topography

The Elevation of the applied areas is given below:

| Sl. No. | Particulars | Details |
|---|---|---|
| 1 | Elevation | S.N: 1 — Block No: **Block No. 06** — Elevation: 1720 m to 1760 m |

### 2.3.2 REGIONAL GEOLOGY

The intermountain Kashmir Valley exhibits one of the best developed Stratigraphic successions from Proterozoic to Quaternary, witnessing a complete Stratigraphic sequence of marine Palaezoic, Mesozoic and Cenozoic. Towards the south of the valley, the Pir Panjal Range is strongly folded forming the anticlinorium of Great Himalaya and towards the northwestern fringe is the syntaxial bend of Himalayan orogenic chain. District Baramulla forms part of north western Kashmir and lies in the northern slope of Pir Panjal Range of the lesser Himalaya. Structurally, the area is characterized with Para-autochthonous zone- a major tectonic feature which is bounded by Muree Thrust in south and Panjal Thrust in north. A generalized Regional Stratigraphic sequence of the district is given below:

**Table 2.2 Geological Succession**

| Group | Formation | Lithology | Age |
|---|---|---|---|
| | Quaternary | Alluvium – Clay, Silt and Sand | Holocene |
| **Karewa** | Naugam | Sand, marl, conglomerate and loess sediments. | Pliiocene-Pleistocene |
| | Hirpur | Clay intercalated with silt, sand, conglomerate and lignite. | |
| | Lower Murree | Grey sandstone, shale and siltstone | Upper Ecocene to Lower Miocene |

| | | | |
|---|---|---|---|
| | Nummulitic Limestone | Light grey limestone, shale with nummulities | Palaeocene |
| **Pir Panjal** | Panjal Volcanics | Light and dark colour amygdaloidal andesitic to basaltic lava flow | Early Permian |
| | Kazinag Granite (=Dudran) | Medium to coarse grained biotite granite/gneiss,porphyritic granite, pegmatatite, quartz vein etc. | Palaeozoic |
| **Dogra** | Chandanwari | Grey massive arenite & quartzite | Meso-Proterozoic |
| | Baren | Grey quartz sericite phyllite, quartz chlorite phyllite and basic lava flow. | |
| | Tirkanjan | Grey serictic phyllite and chlorite phylliteand metabasics. | |
| | Silkhala Formation | Granetiferous sericite phyllite,Quartz chlorite schist, graphic limestone, marble with gypsum and graphite. | Proterozoic |

**Salkhala**: Salkhala Formation of Proterozoic Age exposed in the western part of the district represents the basement complex of the District and Valley as well. The formation comprises high grade meta-sedimentary suite consisting of phyllite, schist, quartzite, limestone, lenticular gypsum and occasional meta-volcanics. The phyllites are frequently carbonaceous and schists are chloritic, serictic, graphitic and garnetiferous.

**Dogra Group**: The Dogra group of Meso- Proterozoic Age are extensively exposed in the northwest and southwest part of the district and conformably overlie the rocks of Salkhala Formation. Dogra Group is divisible into three major Formations viz. Tirkanjan, Baren and Chandanwari. Tirkanjan Formation constitutes the oldest litho-unit of Dogra Group and is represented by grey sericitic phyllite, chlorite phyllite and meta-basic sills. Baren Formation is represented by grey quartz-sericite phyllite, quartz-chlorite phyllite and basic lava flows. Chandanwari Formation conformably lies over Baren Formation and comprises mainly slate, quartzite and arenite. The general trend of the rocks is NW-SE to

NE-SW with dips varying 20˚ to 80˚ in either direction. Most of the litho units of Dogra Group are foliated, limonitised and mineralized at places, highly folded and contains thin arenite bands, besides traversed profusely by quartz veins along and across the foliation planes.

**Kazinag (Dudran) Granites**: Kazinag granitoid represents a major granitic body intrusive into the rocks of Kashmir Tethyan Basin. Kazinag Granitoid intrudes the rocks of Salkhala Formation of Meso-Proterozoic age, towards the northwest part of the district covering an area of about 110 sq km. A small granitoid body occurring as north-south trending linear body is well exposed in south-western part of the district known as Dudran Granites. The litho-unit is leucocratic, holocrystalline, coarse grained and porphyritic in texture. It is dominantly composed of quartz, felspers, while as biotite and tourmaline occus as accessories.

**Panjal Volcanics**: Panjal Volcanics of Lower Permian Age are exposed in central, north and south extremity of the district. These litho-units are usually fine grained, light to dark green in colour, basaltic and andesitic in composition with amygdaloidal structure. The green colour is probably due to the presence of chlorite and epidote.

**Numulitic Limestone**: This linear Formation comprises foraminiferal limestone in the basal part and variegated shale in the upper part is exposed in south-western part of the district. The Numilitic Limestone occurring in the basal part of the Formation and has yielded foraminifera ( Nummulites sp., Assilina sp. And Operculina sp.) and corals (hexacorals) which suggest a Palaeocene Age of these rocks.

**Lower Muree**: Numilitic Limestone is overlain by Murree Group ranging in age from Upper Eocene to Lower Miocene and well exposed in south-western part of the district. Lower Murree is dominantly an argillaceous assemblage comprising thick bands of deep chocolate brown to purplish shale, siltstone with subordinate alterations of grey, brownish grey and greenish grey, generally fine grained micaceous and thunly bedded. Hard and compact sandstone with impersistent interbeds of concretionary clay, clay, conglomerate, and limestone/marlstone.

**Karewa**: Karewa Group including Hirpur, Nagum and Dilpur Formations represents the Pliocene-Pliestocene period and occupies the alluvial Basin of Kashmir. In District Baramulla, the Karewa Group is exposed in northeast and southeast part of the District. The Hirpur Formation is essentially a lacustrine-fluvial deposition mostly argillaceous characterized by plastic grey to bluish grey clay, light grey sandy clay, lignite and lignitic

clay, coarse to medium grained sand and conglomerates. It is characterized by marker lignite seams and very rich assemblage of fossil plants. These rocks are also found along the slopes of the Pir Panjal Range at considerable altitude with fairly high dips indicating neotectonic activity. The lower Karewas are overlain by the Nagum Formation which is fluvio-glacial in origin. It represents arenaceous deposits characterized by brown, grey sandy clay, medium to coarse grained sand, cream colored marl, conglomerate and loam (loess) sediments. This Formation is disposed horizontally and is reportedly devoid of fossils or presence of ligniote.

The youngest Dilpur Formation blankets the Nagum Formation and comprises a small thickness of brown loamy silt intercalated with sandy horizons at places.

**Quaternary**: Quaternary deposits are present along the vast alluvial tracts, flood plains, river terraces, talus, scree, fan deposits of major rivers and their tributaries and fluvio-glacial deposits. It comprises unconsolidated and ill sorted fine to medium grained clay, sand, silt, gravel, cobble, and occasional boulder size, angular to sub-angular rock fragments. Quaternary deposits are dominantly exposed in the north, east and south east part of the district.

***Source: Mining Plan***

**EXPLORATION**

The study of the deposits to the extent of quality and quantity in the area is already conducted by the Geology & Mining Department. On the basis of which the e-auction was held. Since the lease area comprises of nallah muck, boulders, bajri etc. which is proposed to utilize as minor mineral for construction purposes, and the lease is only for five years as such, there is no scope for future prospecting of the area. The geological mapping of the other formations has already been conducted and is beyond the cope present assignment.

The river bed material is generation of weathering in its catchment area regions, which later on gets transported during floods and gets deposited in the form of high energy and low energy deposits at the sites along the longitudinal profile of the river. These deposits get deposited in the form of point bar and channel bar deposits which led to emergence of braided system of the river in comparatively plainer regions. These deposits are seasonally replenishable. And the rate of replenishment depends on yearly frequency of the floods.

Therefore, no specific method of explorations with respect to quantification is employed. The mineral excavated from the river bed will be replenished during monsoon periods and

flash floods during the rest of the part of the year. Besides the extraction of minor mineral is limited upto 3 meters below the surface, therefore there is no need of further exploration.

***Source: Mining Plan***

### 2.3.3 CLIMATE

Temperate-cum-Mediterranean type of climate. The average annual precipitation is 660 mm. In winters, rainfall occurs from the western disturbances (temperate cyclones). These disturbances have their origin in the Mediterranean Sea. The rainfall generated by these cyclones is fairly widespread locally known as Alamgir. (About 65% of the precipitation occurs in the form of snow during winter season, i.e. December to February. March and April are the months of rainfalls.

## 2.4 GEOLOGICAL & MINEABLE RESERVES

The reserves have been each stretches & for individual blocks. Geological reserves and mineable reserves have been completed through cross sectional area method. The area of each section line is multiplied by strike influence to get the volume.

**Table-2.3:- Summary of Reserves Block No. 06**

| S. No | Category | Reserves |
|---|---|---|
| **1** | Total Geological Reserve | 4,42,520.0 MT |
| **2** | Proposed Production | 1,92,400 TPA |
| **3** | Ultimate depth of Mining | 1 m |

***Source Mining Plan***

### 2.4.1 Type of Mining

Mining will be carried out by open cast semi mechanized method. It is proposed to produce 9,62,000 MT considering 270 working days with annual production of 1,92,400 MT/year of river bed material. For this, following consideration taken for the proposed mine layout to be carried out systematically & scientifically:

1. Mining activity will be carried out by open cast Semi-mechanized method.
2. Lightweight excavators will be used for digging & loading of mineral in Tippers.
3. No OB/ waste material will be produced.
4. No drilling/ blasting are required as the material is loose in nature.

5. Roads will be properly made and sprayed by water for suppression of dust.
6. Roads in the lease area for the movement of loaded trippers/trucks.
7. Extraction activities will start in the block from the upstream end to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.

### 2.4.2 Year Wise Production Schedule:

The annual exploitation of sand from downstream Nallah Ferozpora is given below:-

**Table-2.4:- Summary of Production details**

| Year | Production Rate(Tones) |
|---|---|
| 1st | 1,92,400 |
| 2nd | 1,92,400 |
| 3rd | 1,92,400 |
| 4th | 1,92,400 |
| 5th | 1,92,400 |

***Source: Mining Plan***

### 2.5 Conceptual Mining Plan

The digging depth will be restricted to 1 m only. This will be further get replenished during the rainy season. The deposit in the river bed will never exhaust. The material will be regularly replenished during floods by the action of river water. The following steps will be taken care in mining:

- Pit limit at the end of lease period
- Sites of disposal of waste rock and top soil at the end of lease period
- No top soil or waste will be generated in the mining as such no disposal of waste is needed.

### 2.6 Anticipated life of mine

There is as such no specific life of the mine as the area under reference is inactive part of river bed of the river and its pale channels and whatever quantity of minor minerals are extracted from the Applied Area during five year; almost equal to extracted quantity of the

same are replenished every year and the river bed area will be leveled & restored back. However, as lease has been granted for 5 years, mining will be done for the allotted time.

### 2.6.1 Waste –disposal arrangement

No top soil is present in the mining area as it is riverbed. Small amount of domestic waste will be generated by the workers at the site, which will be disposed off through proper municipal way. No other waste generation is expected. No waste will be thrown into the streams or left on the banks. Separate bins will be kept within the lease area for domestic wastes.

## 2.7 GENERAL FEATURES

### 2.7.1 Land-use pattern

The mine lease area is hilly terrain region with river bed and river banks. There is no forest land or agriculture land in the mine lease area. The entire mining lease lies within River.

### 2.7.2 Surface drainage pattern

Nallah Ferozpora originates on the higher reaches of Pir Panjal Range feeded by many mountain streams, small lakes and springs. It bifurcates at Kulhama village into two branches; one flowing in southeast direction and the other one takes north-easterly course. The southeast branch flows upto Golgam in district Baramulla before entering in district Budgam, whereas the northeast branch narrows beyond Babgund village and empties itself into Halgam Jhil and Sultanpurich Rakh. Nalla Ferozpora flows for 55.45kms and drains 365 sq km area of the district. In its course Nallah Ferozpora erodes consolidated Panjal Volcanics and Quaternary sediments and represents the main source of Nallah muck (Nallah boulder, bajri and sand) in the district.

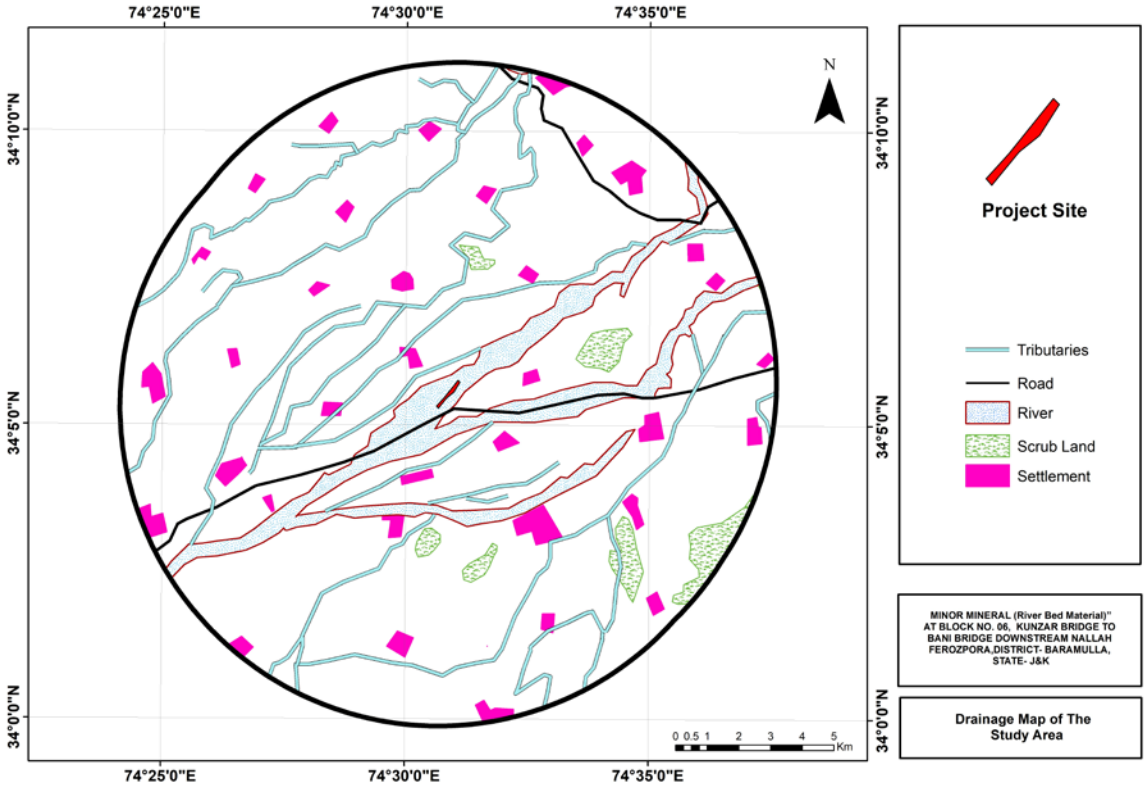


**Figure 2-2: Drainage pattern**

### 2.7.3 Man power requirement

The manpower requirement for the proposed project will be given below who will be utilized for excavation & loading of minerals into trucks or tractor-trolleys. Break-up of Man-power requirement is given in below:

**Table 2.5: Manpower Requirement**

| S No | Employment | No of Person |
|---|---|---|
| 1 | Mining Manager (Part time) | 1 |
| 2 | Supervisor | 1 |
| 3 | Manager (Accounts) | 1 |
| 4 | Operator | 2 |
| 5 | Driver | 3 |
| 6 | Helper | 4 |
| **Total** | | **12** |

### 2.7.4 Water supply

Water requirement for the proposed project will be provided for the workers for drinking & domestic purpose. Water will also be provided for dust suppression. Fresh water will be only used for drinking purpose. The break up for water requirement is given below:

**Table 2.6 Water Requirement**

| | | |
|---|---|---|
| 1 | **Domestic Purpose** | 0.54 KLD |
| 2 | **Dust suppression** | 2.64 KLD |
| 3 | **Green belt development** | 0.40 KLD |
| | **Daily Water Demand** | **3.58 ~ 4.0 KLD** |

**Water Calculation**

| **Activity** | **Calculation** | **Water requirement (KLD)** |
|---|---|---|
| Dust suppression | 440m* 6m* 0.5 lt * 2/1000 | 2.64 |
| Drinking & Domestic | 12*45/1000 | 0.54 |
| Green Belt Development | 100*4L/1000 | 0.40 |
| **Total** | | **3.58~4.0 KLD** |

The water will be supplied from available sources from nearby village.

### 2.7.5 Site services

The following facilities/amenities will be extended by the mine management under site services:

- A temporary rest shelter will be provided for the workers near to the site for rest.
- Provisions will also be made for following in the rest shelter:
- First aid box will be made available at the site. In emergency worker.
- Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.
- Mask and gloves distribution to the workers.

### 2.7.6 Extent of mechanization

The operation will be open cast semi- mechanized/OTFM with use of excavators/JCBs truck /tractors combination or Manually etc. The sand will be collected in its existing form.

### 2.7.7 Statutory requirements

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.

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:

- Jammu & Kashmir Minor Mineral Concession Rule, 1962 and amendments till date.
- The Mines Act, 1952.
- The Mines and Mineral (Development and Regulation) Act, 1957.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960.
- Mineral Conservation and Development Rules, 1988.
- 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.

**********

## 3.0 General

The main objective of describing the environment which may be potentially affected, are a) to assess present environmental quality and the environmental impacts and ii) to identify environmentally significant factors that could preclude mine development. Mining activities affect the existing status of environment at site. In order to maintain the existing environmental status at mining site it is essential study existing environmental status and assess the impact of upcoming project on various environmental components. This chapter gives idea of description of environment status of the study area and this will be helpful for assessment of impact on the environment due to proposed mining activities. Baseline environmental status in and around proposed mining lease area describe the existing conditions of air, noise, water, soil, biological and socio-economic environment. The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The data was collected for various environmental attributes so as to compute the impacts that are likely to arise due to proposed development activity.

### 3.0.1 Study area & study period

The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The baseline environment quality was carried out over a radial distance of 10 km around the mining lease area during Pre-Monsoon Season covering the months of March 2021 to May 2021.

### 3.0.2 Methodology

Base line attributes like ambient air, water, meteorology, noise, Soil, Ecology and Biodiversity & Socio Economy condition were collected as per approved term of reference. Secondary data was also collected from various government department as well as local people. Methodology adopted in this study is as follows.

- ✓ By setting up meteorological station near project site
- ✓ Collection of site specific meteorological data at the mine site.
- ✓ Installation of respiratory dust samplers (for $PM_{10}$, $PM_{2.5}$) at different location in the study area for the collection of primary air pollutant and analyze the existing air conditions.
- ✓ Carrying out a detailed biological study for the Core and Buffer Zone

- ✓ Soil sample were collected from various location in the study area to analyze physical and chemical characteristics for assessment of impact on soil.
- ✓ Ground water samples were also collected from the various locations in the study area for analysing the existing water quality in the study area.
- ✓ Noise measurement has been done in core zone as well as buffer zone to analyze the existing situation in the study area.
- ✓ Literature review that includes identification of relevant data and articles from various publications, various government agencies and other sources for socio-economy, demography has been done with primary data collection in 10 km of the study area.
- ✓ Existing pollution load has been also identified in the buffer zone due to similar activities.
- ✓ Accordingly, field studies were carried out during the study period (March 2021 to May 2021) to establish the existing baseline conditions.

## 3.1 Land Environment of the Study area

### Land use

Land use involves the management and modification of natural environment or wilderness in to built environment such as settlements and semi-natural habitats such as arable fields, pastures, and managed woods. It also has been defined as "the total of arrangements, activities and inputs that people undertake in a certain land cover type.

### Land cover

Land cover is the physical material at the surface of the earth. Land covers include grass, asphalt, trees, bare ground, water, etc. Earth cover is the expression used by ecologist Frederick Edward Clements that has its closest modern equivalent being vegetation. The expression continues to be used by the Bureau of Land Management.

To assess the land use pattern surrounding the 10 km radius of the site, a detailed study was carried out. The land use pattern study reveals that the 10 km environs is predominantly agricultural land.
There will be no diversion or modification of any land use due to the mining activity.

**Table 3-1: Land Use detail**

| Land Use Type | Area (Ha.) |
|---|---|
| Scrub land | 720.05 |
| Forest | 2391.48 |
| Settlement | 1065.56 |
| River | 4522.98 |
| Agriculture | 24998.43 |
| **Total** | **33698.50** |

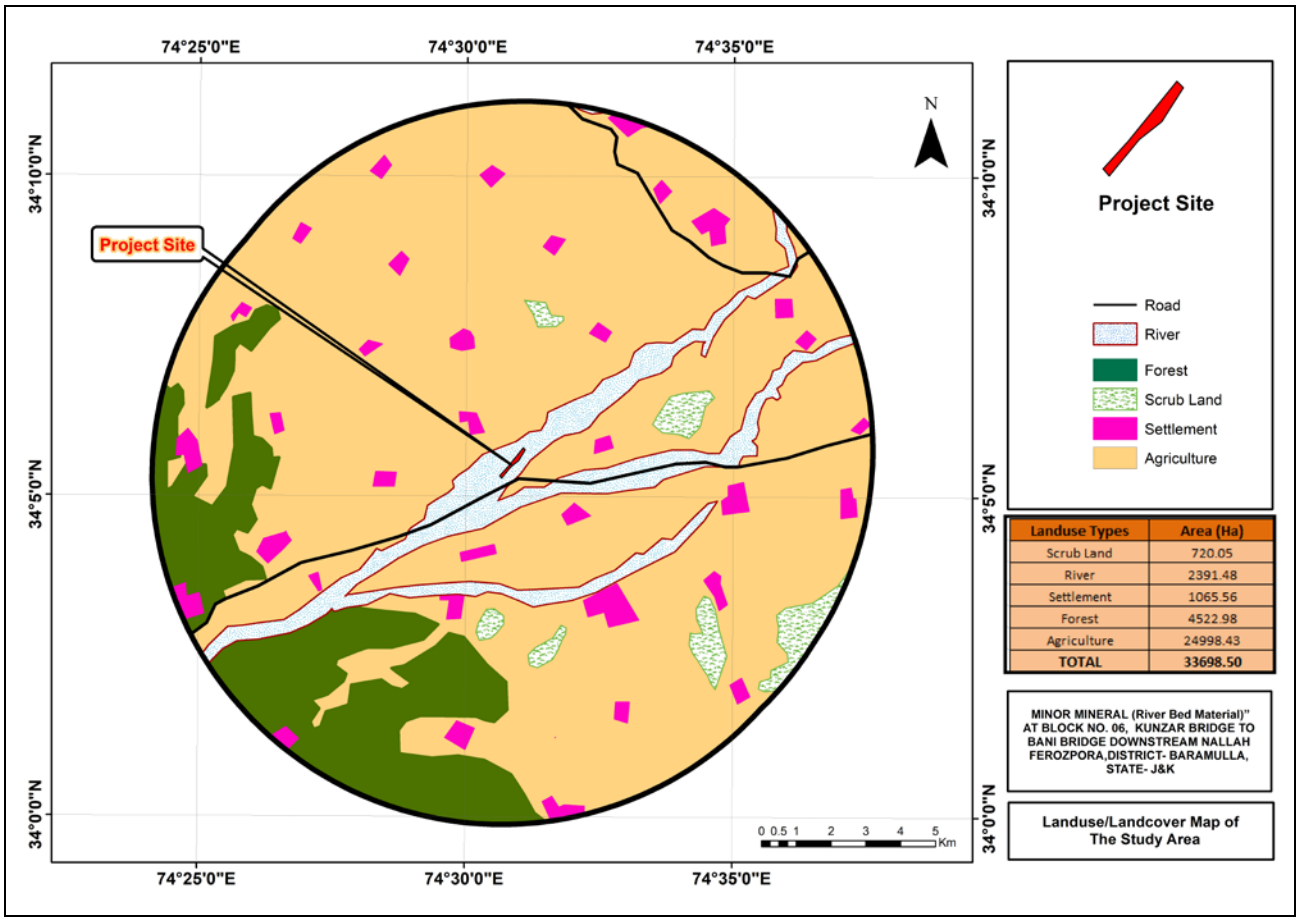


**Figure 3-1: Land use detail**

## 3.2 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 the site and other locations within the 10 km impact zone was monitored during oct, 2020. The water sampling locations marked within the study are presented in **Table 3.2** and the result of the monitoring and analysis are presented in the **Table 3.3** showing Water Quality Monitoring Locations marked within the Study Area.

. **Table 3.2(i) Location of Ground Water Sampling Sites**

| Location code | Monitoring site | Distance (km) | Direction |
|---|---|---|---|
| GW1 | Druroo | 4.28 | W |
| GW2 | Kangamdara | 6.73 | E |
| GW3 | Chukar | 3.74 | N |
| GW4 | Ogmuna | 2.44 | SW |
| GW5 | Monglora | 7.03 | NE |
| GW6 | Pattan | 5.53 | NE |

**Table 3.2(ii) Location of Surface Water Sampling Sites**

| Location code | Monitoring site | Distance /direction |
|---|---|---|
| SW1 | Near village Kunzer (Upstream) | 1.12 Km W |
| SW2 | Project Site | |
| SW3 | Near Village Sherbad Khore (downstream) | 2.16 Km E |

**Table 3.3(i) Ground water Sample Analysis Results**

| S. No. | Parameter | GW1 Druroo | GW2 Kangamdara | GW3 Chukar | GW4 Ogmuna | GW5 Monglora | GW6 Pattan | Requirement (Acceptable Limit) | Permissible Limit in absence of alternate source |
|---|---|---|---|---|---|---|---|---|---|
| **Physical Parameter** | | | | | | | | | |
| **1.** | **pH (at 25 $^0$C)** | 7.41 | 7.74 | 7.34 | 7.27 | 7.45 | 7.63 | 6.5-8.5 | - |
| **2.** | **Colour (Hazen Unit)** | <5 | <5 | <5 | <5 | <5 | <5 | 5 | 15 |
| **3.** | **Turbidity (NTU)** | <1 | <1 | <1 | <1 | <1 | <1 | 1 | 5 |
| **4.** | **Odour** | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable |
| **5.** | **Taste** | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | Agreeable | - |
| **Chemical Parameter** | | | | | | | | | |
| **6.** | **Total Hardness as $CaCO_3$ (mg/L)** | 125.50 | 136.53 | 119.61 | 108.25 | 124.44 | 121.24 | 200 | 600 |
| **7.** | **Calcium as Ca (mg/L)** | 28.45 | 32.24 | 29.78 | 31.78 | 35.64 | 40.65 | 75 | 200 |
| **8.** | **Alkalinity as $CaCO_3$(mg/L)** | 135.00 | 128.26 | 137.42 | 140.12 | 125.88 | 132.54 | 200 | 600 |
| **9.** | **Chloride as Cl (mg/L)** | 45.89 | 37.51 | 35.62 | 41.95 | 42.71 | 38.94 | 250 | 1000 |
| **10.** | **Cyanide as CN (mg/L)** | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.05 | No Relaxation |
| **11.** | **Magnesium as Mg (mg/L)** | 9.37 | 9.25 | 13.48 | 9.49 | 10.16 | 11.79 | 30 | 100 |
| **12.** | **Total Dissolved Solids (mg/L)** | 224.00 | 187.00 | 245.00 | 318.00 | 347.00 | 357.00 | 500 | 2000 |
| **13.** | **Sulphate as $SO_4$ (mg/L)** | 10.11 | 9.93 | 13.45 | 11.54 | 12.38 | 11.22 | 200 | 400 |
| **14.** | **Fluoride as F (mg/L)** | 0.20 | 0.27 | 0.15 | 0.23 | 0.25 | 0.22 | 1.0 | 1.5 |
| **15.** | **Nitrate as $NO_3$ (mg/L)** | 10.35 | 9.66 | 11.59 | 10.12 | 12.44 | 9.45 | 45 | No Relaxation |
| **16.** | **Iron as Fe (mg/L)** | 0.56 | 0.62 | 0.60 | 0.58 | 0.56 | 0.53 | 0.3 | No Relaxation |
| **17.** | **Aluminium as Al** | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.03 | 0.2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **(mg/L)** | | | | | | | | |
| **18.** | **Boron (mg/L)** | 0.23 | 0.28 | 0.26 | 0.30 | 0.29 | 0.34 | 0.5 | 1.0 |
| **19.** | **Chromium as Cr (mg/L)** | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | 0.05 | No Relaxation |
| **20.** | **Conductivity ( mS/cm)** | 0.422 | 0.375 | 0.436 | 0.349 | 0.423 | 0.430 | 1.500 | - |
| **21.** | **Phenolic Compounds (mg/L)** | < 0.001 | < 0.001 | < 0.001 | <0.001 | <0.001 | <0.001 | 0.001 | 0.002 |
| **22.** | **Mineral Oil (mg/L)** | < 0.01 | < 0.01 | < 0.01 | <0.01 | <0.01 | <0.01 | 0.5 | No Relaxation |
| **23.** | **Anionic Detergents as MBA (mg/L)** | <0.02 | < 0.02 | < 0.02 | <0.02 | <0.02 | <0.02 | 0.2 | 1.0 |
| **24.** | **Zinc as Zn (mg/L)** | 0.37 | 0.48 | 0.57 | 0.52 | 0.47 | 0.41 | - | 15 |
| **25.** | **Copper as Cu (mg/L)** | 0.15 | 0.19 | 0.21 | 0.24 | 0.18 | <0.03 | 0.05 | 1.5 |
| **26.** | **Manganese as Mn (mg/L)** | < 0.10 | < 0.10 | < 0.10 | <0.10 | <0.10 | <0.10 | 0.1 | 0.3 |
| **27.** | **Cadmium as Cd (mg/L)** | < 0.001 | < 0.001 | < 0.001 | <0.001 | <0.001 | <0.001 | 0.003 | No Relaxation |
| **28.** | **Lead as Pb (mg/L)** | < 0.01 | < 0.01 | < 0.01 | <0.001 | <0.001 | <0.001 | 0.01 | No Relaxation |
| **29.** | **Selenium as Se (mg/L)** | < 0.01 | < 0.01 | < 0.01 | <0.01 | <0.01 | <0.01 | 0.01 | No Relaxation |
| **30.** | **Arsenic as As (mg/L)** | < 0.01 | < 0.01 | < 0.01 | <0.01 | <0.01 | <0.01 | 0.01 | 0.05 |
| **31.** | **Mercury as Hg (mg/L)** | <0.001 | < 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.001 | No Relaxation |
| **Microbiological Parameter** | | | | | | | | | |
| **32.** | **Total Coliform (MPN/100 mL)** | <2/100ml | <2/100ml | <2/100ml | <2/100ml | <2/100ml | <2/100ml | Absent/250ml | |
| **33.** | ***E. coli* (CFU/100mL)** | Absent | Absent | Absent | Absent | Absent | Absent | Absent/250ml | |

**Table 3.3(ii) Surface water Sample Analysis Results**

| S. No. | Parameter | SW 1 Near village Kunzer (Upstream) | SW 2 Project Site | SW 3 Near Village Sherbad Khore (downstream) |
|---|---|---|---|---|
| **Physical Parameter** | | | | |
| 1. | pH (at 25 $^0$C) | 7.26 | 7.82 | 6.94 |
| 2. | Colour (Hazen) | <5 | <5 | <5 |
| 3. | Turbidity (NTU) | <1 | <1 | <1 |
| 4. | Odour | Agreeable | Agreeable | Agreeable |
| 5. | Total Hardness as $CaCO_3$ (mg/L) | 88.28 | 91.55 | 95.60 |
| **Chemical Parameter** | | | | |
| 6. | Calcium as Ca (mg/L) | 37.62 | 38.55 | 36.74 |
| 7. | Alkalinity as $CaCO_3$ (mg/L) | 86.93 | 97.60 | 95.92 |
| 8. | Chloride as Cl (mg/L) | 24.01 | 23.04 | 27.14 |
| 9. | Residual free Chlorine (mg/L) | <0.20 | <0.20 | <0.20 |
| 10. | Cyanide as CN (mg/L) | <0.02 | <0.02 | <0.02 |
| 11. | Magnesium as Mg (mg/L) | 4.25 | 4.39 | 4.58 |
| 12. | Total Dissolved Solids (mg/L) | 261.00 | 263.00 | 269.00 |
| 13. | Total Suspended Solids (mg/L) | 13.00 | 15.00 | 16.00 |
| 14. | Dissolved Oxygen (mg/L) | 7.1 | 6.9 | 7.0 |
| 15. | Sulphate as $SO_4$ (mg/L) | 13.19 | 12.78 | 11.66 |
| 16. | Fluoride as F (mg/L) | 0.13 | 0.14 | 0.16 |
| 17. | BOD (3 Days at 27 $^0$C) (mg/L) | 4.2 | 4.4 | 4.5 |
| 18. | COD (mg/L) | 8.79 | 8.95 | 9.32 |
| 19. | Conductivity ( mS/cm) | 0.428 | 0.436 | 0.454 |
| 20. | Nitrate as $NO_3$ (mg/L) | 3.32 | 3.50 | 3.78 |
| 21. | Iron as Fe (mg/L) | 0.13 | 0.15 | 0.16 |
| 22. | Aluminium as Al (mg/L) | <0.03 | <0.03 | <0.03 |

| | | | | |
|---|---|---|---|---|
| **23.** | **Boron (mg/L)** | 0.16 | 0.20 | 0.17 |
| **24.** | **Hexa Chromium as $Cr^{+6}$ (mg/L)** | <0.01 | <0.01 | <0.01 |
| **25.** | **Phenolic Compounds (mg/L)** | <0.001 | <0.001 | <0.001 |
| **26.** | **Mineral Oil (mg/L)** | <0.01 | <0.01 | <0.01 |
| **27.** | **Anionic Detergents as MBAS (mg/L)** | <0.02 | <0.02 | <0.02 |
| **28.** | **Zinc as Zn (mg/L)** | 0.21 | 0.24 | 0.28 |
| **29.** | **Copper as Cu (mg/L)** | 0.06 | 0.06 | 0.05 |
| **30.** | **Manganese as Mn (mg/L)** | <0.10 | <0.10 | <0.10 |
| **31.** | **Cadmium as Cd (mg/L)** | < 0.001 | < 0.001 | < 0.001 |

### 3.2.1 Sampling frequency

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per CPCB guidance. Water quality was monitored for parameters as per Methods of Monitoring & Analysis published by CPCB and it was rated according to the CPCB Water Quality Criteria against A, B, C, D & E class of water. Water samples were collected as Grab water sample from sampling location for complete physico-chemical and bacteriological tests respectively.

The surface water quality is compared with CPCB water quality criteria mentioned in **Table 3.4** below:

**Table 3.4, Water quality criteria as per Central Pollution Control Board**

| **Designated-Best-Use** | **Class of water** | **Criteria** |
|---|---|---|
| Drinking Water Source without conventional treatment but after disinfection | A | Total Coliforms Organism MPN/100ml shall be 50 or less<br>pH between 6.5 and 8.5<br>Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less |
| Outdoor bathing (Organized) | B | Total Coliforms Organism MPN/100ml shall be 500 or less;<br>pH between 6.5 and 8.5; |

| | | |
|---|---|---|
| | | Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less |
| Drinking water source after conventional treatment and disinfection | C | Total Coliforms Organism MPN/100ml shall be 5000 or less;<br>pH between 6 to 9;<br>Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less |
| Propagation of Wild life and Fisheries | D | pH between 6.5 to 8.5<br>Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less |
| Irrigation, Industrial Cooling, Controlled Waste disposal | E | pH between 6.0 to 8.5<br>Electrical Conductivity at 25°C micro mhos/cm Max.2250<br>Sodium absorption Ratio Max. 26<br>Boron Max. 2mg/l |
| | Below-E | Not Meeting A, B, C, D & E Criteria |

As per the standard practice, one sample from each station was taken in March. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

**3.2.2 Result & Conclusion:**

- The pH limit fixed for drinking water samples as per IS-10500 Standards is 6.5 to 8.5 beyond this range the water will affect the mucus membrane or water supply system. During the study period, the pH was varying for ground waters from 7.27 to 7.74 and for surface water from 6.94 to 7.82. The pH values for all the samples collected in the study area during study period were found to be within the limits.
- The desirable limit for total dissolved solids as per IS-10500 Standards is 500 mg/l whereas the permissible limit in absence of alternate source is 2000mg/l. In ground water samples collected from the study area, the total dissolved solids are varying from 187.00 mg/l to 357.00 mg/l and

in surface water, it is varing from 261.00 mg/l to 269 mg/l. The TDS of the samples were within the desirable limit & the permissible limit of 500mg/l & 2000 mg/l respectively.

- The values of DO, BOD & COD for all the samples collected in the study area during study period were found to be within the limits.

## 3.3 AIR ENVIRONMENT

Meteorology is the key to understand the air quality. The essential relationship between meteorology and atmospheric dispersion involves the wind in the broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

A meteorological station was set up at the proposed mine premises. Meteorological data was generated during the pre-monsoon monitoring period and shown in **Table-3.5**

The following parameters were recorded at hourly intervals continuously during monitoring period, except rainfall which was recorded on daily basis.

- Wind speed
- Wind Direction
- Air Temperature

**Table 3.5, Metrological Data**

| Month | Temperature °C | | Rainfall (mm) | | Wind Speed (Km/Hr) | |
|---|---|---|---|---|---|---|
| | Min | Max | Rain (mm) | No. of Days | Avg | Max |
| Mar 2021 | 4 | 15 | 261.2 | 22 | 4 | 7 |
| April, 2021 | 7 | 17 | 316.3 | 25 | 4.5 | 8 |
| May, 2021 | 14 | 24 | 140.5 | 30 | 4.4 | 9.1 |

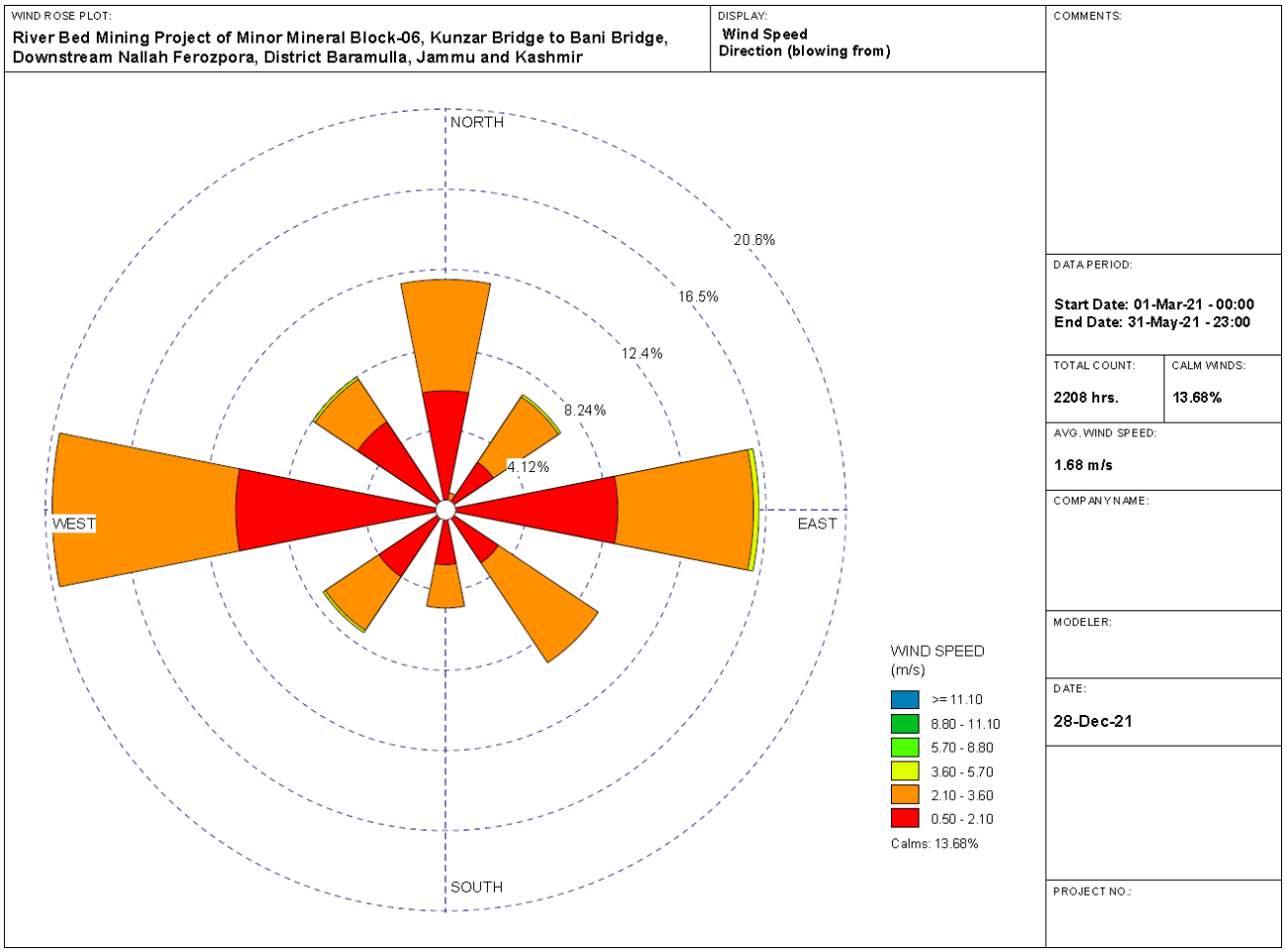


**Figure 3.3 Project Site Wind-rose**

### 3.3.1 Secondary Data

Secondary data has been collected for temperature, relative humidity, rainfall, wind speed and direction. The data at IMD is usually measured twice a day viz., at 0830 and 1730 hr.

The monthly maximum, minimum and average values are collected for all the parameters except wind speed and direction.

### 3.3.2 Ambient Air Quality

The ambient air quality was monitored in the impact area as per MoEF & CC guidelines. The study area represents entirely rural environment. The prime objective of the baseline air quality study was to assess the ambient air quality of the mining lease area.

### 3.3.3 Selection criteria for monitoring location

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance programme has been based on the following consideration.

- Meteorological parameters including wind direction
- Topography of the study area
- Representative of regional background air quality for obtaining baseline status
- Representative of likely impact areas.

Ambient Air Quality Monitoring (AAQM) stations were set up at 7 locations with due consideration to the above mentioned points. AAQM locations were selected in downwind, upwind as well as crosswind direction of the proposed mining lease area covering core and buffer zones. The monitoring stations are shown in **Figure 3.4** and shown in **Table-3.6.**

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours for three months during the study period. The common air pollutant namely Particulate Matter-10 ($PM_{10}$) & $PM_{2.5}$, Sulphur-dioxide ($SO_2$) and Oxides of Nitrogen ($NO_2$) has been measured through a planned field monitoring.

The baseline values of the air pollutants of concern are presented in Tables below statistical parameters like minimum, maximum, average and 98$^{th}$ percentiles have been computed from the observed field data for all sampling stations. These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for industrial, residential and rural zone.

**Table 3.6, Ambient Air Quality Monitoring Stations**

#### 3.3.4.1 Baseline Scenario

| Code | Monitoring location | Distance (km) | Direction |
|---|---|---|---|
| AAQ1 | Mine site | - | - |
| AAQ2 | Druroo | 4.28 | W |
| AAQ3 | Kangamdara | 6.73 | E |
| AAQ4 | Chukar | 3.74 | N |
| AAQ5 | Ogmuna | 2.44 | SW |
| AAQ6 | Monglora | 7.03 | NE |
| AAQ7 | Pattan | 5.53 | NE |

### 3.3.4.1.1 Ambient Air Quality in the Study Area PM2.5

| Location Code | PM2.5 (µg/m$^3$ ) | | | | |
|---|---|---|---|---|---|
| | Name of the station | Min | Max | Average | 98$^{th}$ Percentile |
| AAQ1 | Mine site | 19.54 | 38.21 | 25.35 | 37.18 |
| AAQ2 | Druroo | 16.74 | 30.07 | 21.12 | 29.95 |
| AAQ3 | Kangamdara | 18.73 | 33.96 | 24.3 | 33.66 |
| AAQ4 | Chukar | 19.17 | 30.94 | 24.72 | 30.54 |
| AAQ5 | Ogmuna | 16.72 | 28.73 | 21.43 | 28.43 |
| AAQ6 | Monglora | 20.5 | 28.5 | 23.06 | 28.16 |
| AAQ7 | Pattan | 20.05 | 34.75 | 25.2 | 34.63 |

### 3.3.4.1.2 Ambient Air Quality in the Study Area PM10

| Location Code | PM10 (µg/m3 ) | | | | |
|---|---|---|---|---|---|
| | Name of the station | Min | Max | Average | 98th Percentile |
| AAQ1 | Mine site | 39.66 | 59.03 | 47.44 | 58.6 |
| AAQ2 | Druroo | 34.48 | 47.03 | 39.62 | 46 |
| AAQ3 | Kangamdara | 35.73 | 48.98 | 40.39 | 46.79 |
| AAQ4 | Chukar | 35.65 | 46 | 41.3 | 45.69 |
| AAQ5 | Ogmuna | 31.2 | 41.06 | 37.94 | 40.91 |
| AAQ6 | Monglora | 36.16 | 47.21 | 43.55 | 47.09 |
| AAQ7 | Pattan | 39.17 | 51.53 | 45.78 | 49.69 |

### 3.3.4.1.3 Ambient Air Quality in the Study Area SO2

| Location Code | SO2 (µg/m$^3$ ) | | | | |
|---|---|---|---|---|---|
| | Name of the station | Min | Max | Average | 98$^{th}$ Percentile |
| AAQ1 | Mine site | 5.02 | 9.84 | 6.47 | 9.45 |
| AAQ2 | Druroo | 4.35 | 9.04 | 6.14 | 8.6 |
| AAQ3 | Kangamdara | 5.01 | 8.63 | 6.49 | 8.49 |
| AAQ4 | Chukar | 5.68 | 9.32 | 7.4 | 9.19 |
| AAQ5 | Ogmuna | 5.69 | 8.46 | 7.05 | 8.37 |
| AAQ6 | Monglora | 5.84 | 10.11 | 7.6 | 9.76 |
| AAQ7 | Pattan | 5.5 | 9.7 | 7.41 | 9.55 |

### 3.3.4.1.4 Ambient Air Quality in the Study Area NO2

| Location Code | NO2 (µg/m$^3$ ) | | | | |
|---|---|---|---|---|---|
| | Name of the station | Min | Max | Average | 98$^{th}$ Percentile |
| AAQ1 | Mine site | 11.9 | 23.04 | 15.6 | 22.89 |
| AAQ2 | Druroo | 10.45 | 18.51 | 14.09 | 17.86 |
| AAQ3 | Kangamdara | 11.12 | 20.49 | 15.25 | 19.77 |
| AAQ4 | Chukar | 10.65 | 19.28 | 14.13 | 18.26 |
| AAQ5 | Ogmuna | 10.17 | 15.48 | 12.8 | 15.4 |
| AAQ6 | Monglora | 10.83 | 18.11 | 14.08 | 17.77 |
| AAQ7 | Pattan | 10.2 | 18.92 | 14.31 | 18.33 |

The Ambient Air Quality Monitoring reveals that of monitoring stations with minimum Concentrations of PM10 were 31.20 µg/$m^3$ and maximum 59.03 µg/$m^3$ . The result of PM 2.5 reveals that the minimum concentration of 16.72 µg/$m^3$ while maximum concentration of 38.21µg/$m^3$.

The gaseous pollutants SO2 and NOx were within the prescribed CPCB limit of 80 µg/$m^3$. For residential and rural areas at all stations. The minimum & maximum concentrations of SO2 were found to be 4.35 µg/$m^3$ & 10.11 µg/$m^3$ respectively. The minimum & maximum concentrations of NOx were found to be 10.17 µg/$m^3$ & 23.04µg/m3 respectively.

## 3.4 SOIL ENVIRONMENT

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 7 locations and analyzed as per CPCB norms. The soil sampling locations are marked in **Figure 3.5** and shown in **Table 3.7** The physico-chemical characteristic of these soil samples is given in **Table-3.8.**

**Table 3.8, Soil Monitoring Stations**

| Code | Monitoring location | Distance (km) | Direction |
|---|---|---|---|
| SQ1 | Mine site | - | - |
| SQ 2 | Druroo | 4.28 | W |
| SQ 3 | Kangamdara | 6.73 | E |
| SQ 4 | Chukar | 3.74 | N |
| SQ 5 | Ogmuna | 2.44 | SW |
| SQ 6 | Monglora | 7.03 | NE |
| SQ 7 | Pattan | 5.53 | NE |

**Table 3.8 Physico-chemical properties of soil**

| S. No. | Parameter | Unit | S1 ( Mine site) | S2 (Druro) | S3 (Kangamdara) | S4 (Chukar) | S5 (Ogmuna) | S6 (Monglora) | S7 (Pattan) |
|---|---|---|---|---|---|---|---|---|---|
| 1. | pH(1:5 suspension) | - | 7.44 | 7.35 | 7.28 | 7.20 | 7.71 | 7.66 | 7.45 |
| 2. | Electrical Conductivity at $25^{O}C$ (1:5suspension.) | µS/cm | 421 | 437 | 416 | 437 | 440 | 432 | 392 |
| 3. | Calcium (as Ca) | mg/kg | 384.20 | 408.27 | 417.31 | 429.24 | 411.38 | 415.52 | 437.09 |
| 4. | Magnesium( as Mg) | mg/kg | 115.41 | 138.28 | 120.98 | 125.31 | 116.72 | 132.17 | 114.42 |
| 5. | Sodium (as Na) | mg/kg | 212.81 | 233.57 | 222.32 | 220.53 | 218.81 | 230.33 | 221.35 |
| 6. | Potassium (as K) | mg/kg | 83.89 | 92.11 | 90.43 | 80.79 | 86.90 | 91.45 | 89.31 |
| 7. | Water holding Capacity | % by mass | 28.70 | 28.94 | 31.22 | 32.35 | 29.76 | 31.92 | 30.87 |
| 8. | Porosity | % by mass | 32.47 | 31.19 | 30.28 | 31.52 | 29.93 | 30.32 | 28.27 |
| 9. | Sand | % by mass | 53.3 | 48.5 | 50.3 | 51.1 | 53.5 | 51.51 | 53.23 |
| 10. | Clay | % by mass | 27.9 | 34.3 | 31.4 | 31.3 | 30.2 | 33.55 | 30.42 |
| 11. | Silt | % by mass | 18.8 | 17.2 | 18.3 | 17.6 | 16.3 | 14.94 | 16.35 |
| 12. | Cation Exchange Capacity | Meq/100gm | 11.94 | 13.32 | 14.13 | 12.65 | 13.54 | 14.38 | 13.34 |
| 13. | Sodium Absorpation Ratio | - | 1.23 | 1.09 | 1.19 | 0.95 | 0.98 | 1.23 | 0.87 |
| 14. | Nitrogen | % by mass | 0.15 | 0.17 | 0.13 | 0.20 | 0.18 | 0.12 | 0.13 |
| 15. | Phosphorus | mg/kg | 10.44 | 10.37 | 9.92 | 10.74 | 9.87 | 11.19 | 10.64 |
| 16. | Zinc | mg/kg | 9.71 | 9.96 | 10.56 | 10.23 | 9.86 | 11.14 | 10.56 |
| 17. | Bulk Density | gm /cc | 1.28 | 1.33 | 1.30 | 1.27 | 1.29 | 1.32 | 1.31 |

**Observations:**

Samples collected from identified locations indicate the soil is sandy type and the pH value ranging from 7.20 to 7.71, which shows that the soil is alkaline in nature. Potassium is found to be from 80.79 mg/kg to 92.11 mg/kg.

## 3.5 NOISE ENVIRONNENT

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 3.10** The noise level monitoring locations are marked in **Figure 3.6** and shown in **Table 3.9.**

**Table 3.9 Noise quality monitoring stations**

| Code | Monitoring location | Distance (km) | Direction |
|---|---|---|---|
| NQ1 | Mine site | - | - |
| NQ 2 | Druroo | 4.28 | W |
| NQ 3 | Kangamdara | 6.73 | E |
| NQ 4 | Chukar | 3.74 | N |
| NQ 5 | Ogmuna | 2.44 | SW |
| NQ 6 | Monglora | 7.03 | NE |
| NQ 7 | Pattan | 5.53 | NE |

**Table 3.10 Noise Monitoring Results**

| S. No. | Locations | | Equivalent Noise Level, dB (A) | | | |
|---|---|---|---|---|---|---|
| | | | Limit (as per CPCB Guidelines), Leq, dB(A) | | Observed value Leq, dB(A) | |
| | | | DAY* | NIGHT* | DAY* | NIGHT* |
| 1 | NQ1 (Mine site) | Industrial Zone | 75 | 70 | 60.21 | 49.32 |
| 2 | NQ2 ( Druroo) | Residential Zone | 55 | 45 | 45.57 | 38.14 |
| 3 | NQ3 (Kangamdara) | Residential Zone | 55 | 45 | 44.25 | 36.75 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | NQ4 ( Chukar) | Residential Zone | 55 | 45 | 43.17 | 37.55 |
| 5 | NQ5 (Ogmuna) | Residential Zone | 55 | 45 | 42.32 | 35.86 |
| 6 | NQ6 ( Monglora) | Residential Zone | 55 | 45 | 41.72 | 34.71 |
| 7 | NQ7 ( Pattan) | Residential Zone | 55 | 45 | 47.20 | 39.12 |

**Results**

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 41.72 dB (A) & 60.21 dB (A) respectively. The minimum & maximum noise levels at night time were found to be 34.71 dB (A) & 49.32 dB (A) 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.

## 3.6 BIOLOGICAL ENVIRONMENT

### 3.6.1.1 Introduction

The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes. The vast array of interactions among the various components of biodiversity makes the planet habitable for all species, including humans. There is a growing recognition that, biological diversity is a global asset of tremendous value to present and future generations. At the same time, the threat to species and ecosystems has never been as great as it is today. Species extinction caused by human activities continues at an alarming rate. Protecting biodiversity is in our self-interest.

The biological study was under taken by Ecology & Biodiversity Expert, as a part of the EIA study report to understand the present status of ecosystem prevailing in the study area, to compare it with past condition with the help of available data, to predict changes in the biological environment as a result of present activities and to suggested measures for maintaining its health.

The state of J & K has been regarded as heaven on earth, and is also called the biomass of state of India. The biodiversity of the rich area of J & K happens to be one of the 26 hotspots in India with high endemicity. The whole Himalayan belt is one hotspot mega venture having 8 critical areas

which includes two regions from the state viz Ladakh and Kashmir. The environments, social and economic value of plants are very well known. On the other hand, the faunal component of biodiversity of the state is rich with interesting and unique forms both in the forest zone and above forest line. The variety of animal forms ranges from higher groups like vertebrates, including mammals, birds, reptiles, amphibians and lower groups like invertebrates including insects and even unicellular micro organisms.

A survey was conducted to study the flora around 10 km radius. Some of the information was gathered from the local habitants. All the collected data were classified to interpret the impact of pollution on the flora and fauna of that region. Survey of the mild plants as well as cultivated crop plants was made and all the available information was recorded. The primary data collected was compared with the Secondary data collected from Forest Department, Jammu & Kashmir and Forest Division in District Baramulla.

**Physical Environment of the Study Area**

The Baramulla district is spread from Srinagar district and Ganderbal district in the east to the line of control in the west, and from Kupwara district in the north and Bandipore district in the northwest to Poonch district in the south and Badgam district in the southwest. District Baramulla of Kashmir comprises of about 16 tehsils in which: Uri, Pattan, Boniyar, Tangmarg, Sopore, Wagoora,and Baramulla are very famous.This district has also 26 blocks: Uri, Rohama, Rafiabad, Zaingeer, Sopore, Boniyar, Baramulla, Tangmarg, Singhpora, Pattan, Wagoora, Kunzer, Paranpillian, Bijhama, Norkhah, Narwav, Nadihal, Kandi Rafiabad, Hardchanum, Tujjar Sharief, Sangrama, Sherabad Khore, Lalpora, Wailoo, Khaipora and Chandil Wanigam.

**Objectives and Purpose of Study:**

The basic objectives of the study are to evaluate the status of the flora and fauna of the core area and the buffer areas with specific reference to the rare or endangered or endemic or threatened (REET) species. The study is also designed to evaluate the adverse impacts of the proposed activity, if any and to suggest remedial / mitigation measures in accordance with the objectives as desired by the IAIA and the Ministry of Environment , Forests & Climate Change (MoEF&CC), Government of India (GoI).

**Survey Methodology**

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 literature.

**Field study period:** The ecological survey has been conducted for one season. The details are given below:

**Core zone:** At the project site.

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

Inventory of flora and fauna has been prepared on the basis of collected data. The mode of data and parameters considered during field investigations is given below:

**Methodology for Terrestrial Ecology:** The primary objective of survey was to describe the floral and faunal communities within the study area. The sampling plots for floral inventory were selected randomly in the suitable habitats (Anderson, 1867; Jain and Rao, 1983). The methodology adopted for faunal survey involve random survey, opportunistic observations, diurnal bird observation, active search for reptiles, faunal habitat assessment, active search for scats and foot prints, animal call, and review of previous studies. The aim was to set baselines in order to monitor and identify trends after the commissioning of the mining activity. Emphasis has been placed on presence of endemic species, threatened species if any present in the study area.

**Methodology for Inland water sampling :** The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples are filtered through plankton net of 20µ mesh size (APHA, 1971). The filtered samples are concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the quantitative analysis was carried out for phytoplankton and zooplankton. The standard flora and other literature are followed for the qualitative evaluation of Plankton (Welch, 1948; Vollenweider, 1969; Edmondson, 1974).

**Table 3.11: Mode of data collection & parameters considered during the survey**

| Aspect | Data | Mode Of Data Collection | Parameters Monitored |
|---|---|---|---|
| Terrestrial Ecology | Primary data Collection | By field survey | Floral and Faunal diversity |
| | Secondary data collection | From authentic sources like Forests/Wild Life department of Jammu Kashmir , available published literatures like –Biodiversity and Environment Management and available publishes papers of scholars | Floral and Faunaldiversity and studyof vegetation, forest type, importanceetc. |
| Aquatic Ecology | Primary data Collection | By field survey | Floral and Faunaldiversity |
| | Secondary data collection | From authentic sources like Forests/Wild Life department of Jammu Kashmir , available published literatures like – Biodiversity and Environment Management and available publishes papers of scholars. | Floral and Faunaldiversity and study of vegetation, forest type, importance etc. |

**Floral Diversity of the study area**

The climatic, edaphic and biotic variations with their complex interrelationship and composition of species, which are adapted to these variations, have resulted in different vegetation cover, characteristic of each region (Ohasi, 1975). The tree species, herbs, shrubs, climbers and major crops, were documented during this base line study.

**Trees:** The dominant trees in the study area are following :-

**Table 3.12: Trees in the study area**

| S.No. | Tree Species | Family | Common Name | Status |
|---|---|---|---|---|
| 1. | *Abies pindrow Royle.* | Pinaceae | Silver fir, Budul, Taleesha | Common |
| 2. | *Acer caesium* | Aceraceae | Chaind, Tilpattar | Common |
| 3. | *Betula utilis D.Don.* | Betulaceae | Burja, Bhojpatra | Common |
| 4. | *Celtis australis Linn.* | Ulmaceae | Kharak brimij | Common |
| 5. | *Crataegus songaric G.Koch.* | Rosaceae | Ringkul, Shonth | Common |
| 6. | *Euonymus hamitonian Wallich.* | Celastraceae | Sheelkul, Chhalchhattar | Uncommon |
| 7. | *Euonymus fimbriatus Wall roxb* | Celastraceae | Tran, Lichhoi | Uncommon |
| 8. | *Fraxinus hookeri Wenzig* | Oleaceae | Sinnu, Soom, Hoom | Threatened |
| 9. | *Juglans regia Linn.* | Juglandaceae | Walnut, dun, khod, Achho | Common |
| 10. | *Morus alba* | Moraceae | Tut | Common |
| 11. | *Morus indica* | Moraceae | Tut | Common |
| 12. | *Morus nigra* | Moraceae | Tut | Common |
| 13. | *Parrotiopsis jacquimontia (Decne) Rehder.* | Hamamelidaceae | Hatab, Pasaid | Common |
| 14. | *Pinus excelsa* | Pinaceae | | Common |
| 15. | *Platanus orientalis L.* | Plantanaceae | Booin, Chinaar, Chanaar | Common |
| 16. | *Populus caspica Bornm.* | Salicaceae | Frass, Safeda | Common |
| 17. | *Prunus cerasifera* | Rosaceae | Chaier | Common |
| 18. | *Prunus cornuta(Wall ex. Royl steudel* | Rosaceae | Bharath | Common |
| 19. | *Pyrus malus* | Rosaceae | | |
| 20. | *Quercus robber L.* | Fagaceae | Oak, Vilaiti, Banj | Common |
| 21. | *Rubinia psedoacacia* | Papilionaceae | | Common |
| 22. | *Salix alba Linn.* | Salicaceae | Bot vir, white willow | Common |
| 23. | *Salix babylonica* | Salicaceae | Majnoo kashirveer | Common |
| 24. | *Salix wallichiana* | Salicaceae | Girveer, Geur, Bhanshri | Common |
| 25. | *Taxus wallichiana* | Taxaceae | Postul | Threatened |
| 26. | *Ulmus lavigata* | Ulmaceae | | Common |
| 27. | *Ulmus wallichiana planchon.* | Ulmaceae | Marnu brin, Braari, Brade | Common |
| 28. | *Ziziphus mauritiona Lamk.* | Rhamnaceae | Ber, Badra | Common |

**Shrubs:** Total 15 shrub species belong to 7 families are enumerated from the study area. The shrubs observed in the study area are given in the table.

**Table 3.13: Major Shurbs in Study area**

| S. No. | Shrub | Family | Local name | Status |
|---|---|---|---|---|
| 1. | *Berberis huegeliana* Schaeider | Berberidaceae | Sumbal, Daruharidra | Rare |
| 2. | *Indigofera hebepetala* Benth.ex.Baker. | Fabaceae | Krass, Sakena | Scarcely distributed |
| 3. | *Indigofer haterantha wallich ex. Brandis* | Fabaceae | Krass, kainthi | Common |
| 4. | *Rosa webiana Wallich ex. Royle.* | Rosaceae | Arwal, Jungli gulaab | Common |
| 5. | *Rosa antennifer* | Rosaceae | Jhaanshi, chhanchh | Common |
| 6. | *Rubus pungens Comb.* | Rosaceae | Chhansh, Jhaansh | Common |
| 7. | *Rubus ulmifolius Schott* | Rosaceae | Jhaanshi, Chhansh | Common |
| 8. | *Sorbaria tomentosa (lindley) Rehder* | Rosaceae | Karukni, Kidsungal | Common |
| 9. | *Spiraea canescens D.Don* | Rosaceae | Dhakk, Takky | Common |
| 10. | *Hydrangea macrophylla L.* | Hydrangea | Himgainda | Abundant |
| 11. | *Chaerophyllum acuminatum Lindley* | Apiaceae | Chikmi, Neochha | Common |
| 12. | *Vibernum cotinifolium D.Don* | Caprifoliaceae | Kumansh, Bhutnoi | Abundant |
| 13. | *Lonicera quinquelocularis Hardw.* | Caprifoliaceae | Bakkadu, Paakhar | Common |
| 14. | *Gaultheria trichophylla Royle.* | Ericaceae | Gandhpuri booti, Gandhpura | Abundant |
| 15. | *Rhododendron anthopogon D.Don.* | Ericaceae | Nchhni, Inga | Common |

**Table 3.14: List of Herbs species in the Study Area**

| S No. | Herbs | Family | Local name | Status |
|---|---|---|---|---|
| 1. | *Anemone obtusiloba* | Ranunculaceae | Rattan jot | Uncommon |
| 2. | *Aquilegia pubiflora wallich ex royle* | Ranunculaceae | Sita di panni | Uncommon |
| 3. | *Aquilegia fragrance. Benth* | Ranunculaceae | Maime hait, kalumb | Common |
| 4. | *Clath alba* Camb. | Ranunculaceae | Tahool , Ashpmaar | Common |
| 5. | *Clematis connata* DC | Ranunculaceae | Hathkad bel, Dhanvati | Common |

| | | | | |
|---|---|---|---|---|
| 6. | *Clematis montana* | Ranunculaceae | Dashraanth , Dudh chivara | Common |
| 7. | *Delphinium denudatum wallich ex hook.f. &Thomas* | Ranunculaceae | Nirbis , Nirvisha | Common |
| 8. | *Delphinium roylei munz* | Ranunculaceae | Nirbis ,Nirvisha | Common |
| 9. | *Thalictrum minus L* | Ranunculaceae | Peeli bani, Haichinsah | Common |
| 10. | *Thalictrum pedunculatum Edqew.* | Ranunculaceae | Mamira ,Pinjaari | Uncommon |
| 11. | *Viola sylvatica* | Violaceae | Nunposh | Common |
| 12. | *Arenaria serpylliofolia Linn.* | Cryophyllaceae | Letarluni | Uncommon |
| 13. | *Lychnis cornaria (L.)Desr.* | Cryophyllaceae | Laltraukal, Angaarda | Threatened |
| 14. | *Hypericum perforatum L.* | Hypericaceae | Basantadu, Basanti | Common |
| 15. | *Tribulus terresteris L.* | Zygophyllaceae | Bhakhada, Tirkundi | Common |
| 16. | *Impatiens bicolor Royle.* | Balsaminaceae | Trul, Hajlu, | Common |
| 17. | *Lathyrus emodi (Wall.ex.Fritsch)Ali* | Fabaceae | Khukni, Triputa | Abundant |
| 18. | *Lathyrus pratensis Linn.* | Fabaceae | Khukni | Common |
| 19. | *Lotus corniculatus* | Fabaceae | | Common |
| 20. | *Genum elatum Wallich.* | Rosaceae | Gogji mool, Bhadrashaak | Common |
| 21. | *Potentilla atrosanguina Lodd.* | Rosaceae | Bajardantu, Rolu | Threatened |
| 22. | *Astilbe rivularis Buch.Ham.Ex.D.Don.* | Saxifragaceae | Pothi | Common |
| 23. | *Sexifraga Sibirica* | Saxifragaceae | | Common |
| 24. | *Sedum adenotrichum Wall.Ex.Edgew.* | Crassulaceae | Dazanposh | Abundant |
| 25. | *Epilobium parviflorum Schreb.* | Onagraceae | Mellu, Loontar jadi | Common |
| 26. | *Bupleurum swatianum Nasir.* | Apiaceae | Zardzaari, Shashparni | Common |
| 27. | *Chaerophyllum acuminatum Lindley.* | Apiaceae | Chikmi, Neochha | Common |
| 28. | *Chaerophyllum reflexum Lindley.* | Apiaceae | Jadgagari, Mukhach | Common |
| 29. | *Ferula jaeschkeana Vatke.* | Apiaceae | Haput Kanphur, Hinga, Ghud-kaindal | Common |
| 30. | *Heracleum lantum Michx.* | Apiaceae | Shuriyal, Phulao, | Common |
| 31. | *Chaerophyllum villosum Wall.ex.DC.* | Apiaceae | Mukhach | Common |
| 32. | *Pimpinella diversifolia DC.* | Apiaceae | Jehn,tirua | Common |

| | | | | |
|---|---|---|---|---|
| 33. | *Scandix pecten-veneris L.* | Apiaceae | Indusaag , Kachhidana | Common |
| 34. | *Seseli libanotis (L)W.Koch.* | Apiaceae | Sappad gajari | Common |
| 35. | *Vicatia coniifolia DC.* | Apiaceae | Shila dhaniya | Abundant |
| 36. | *Asperrula oppositifolia Regal.&Schmalth.* | Rubiaceae | Machheet, Chhalmajeeth | Common |
| 37. | *Gallium asperuloides edgew* | Rubiaceae | Machheetu | Common |
| 38. | *Gallium vernum Linn.* | Rubiaceae | Peela machete | Common |
| 39. | *Anaphalis margaritacea(L)Benth.* | Asteraceae | Bhojli,Kinja | Common |
| 40. | *Anaphalis nepalensis (Sprengel)Hand.* | Asteraceae | Telgangi, Bhujli | Common |
| 41. | *Artemisia dubia Wallich ex.Besser* | Asteraceae | Joon, krinidru | Common |
| 42. | *Artemisia parviflora Roxb.* | Asteraceae | Joon, Tethwan | Common |
| 43. | *Aster diplostephioids C.B.Clark* | Asteraceae | Tarakpushp, phullala | Abundant |
| 44. | *Carpesium abrotanoides Linn.* | Asteraceae | Lihur | Common |
| 45. | *Picris hieracioides Linn.* | Asteraceae | Trumbadu | Rare |
| 46. | *Saussurea albescens (DC)Sch.Bip.* | Asteraceae | Baklol | Common |
| 47. | *Saussurea atkinsonii C.B.Clark* | Asteraceae | Lokat, Baklol | Common |
| 48. | *Saussurea heteromalla (D.Don)Hand-mazz* | Asteraceae | Batola, Dashund | Common |
| 49. | *Solidago virgaaurea Linn.* | Asteraceae | Thanthaana, Sondandi, Kanakshalakha | Common |
| 50. | *Tarracetum dolichophyllum(Kitam)Kitam* | Asteraceae | Lidd guggli, chinnparni | Abundant |
| 51. | *Taraxacum officinale Webr.* | Asteraceae | Handri, Hand, Dullal | Common |
| 52. | *Tragopogon dubius Scop.* | Asteraceae | Thulkal,Girginok | Common |
| 53. | *Tussilago Farfara Linn.* | Asteraceae | Chilchiloti, Ghudkhura | Threatened |
| 54. | *Asyneuma thomsonii (HK.f.et.Th.)Bornm* | Campanulaceae | Branzbooti,Branzhaak | Threatened |

| | | | | |
|---|---|---|---|---|
| 55. | *Campanula aristata Wall* | Campanulaceae | Padi-branz | Common |
| 56. | *Campanula cachmeriana Royle.* | Campanulaceae | Kashir branz | Common |
| 57. | *Campanula lotifolia L.* | Campanulaceae | Branz ghainti | Common |
| 58. | *Codonopsis ovata Benth.* | Campanulaceae | Tokerkachh, Dodad | Threatened |
| 59. | *Androsace rotundifolia* | Primulaceae | Golpattri tuttan | Common |
| 60. | *Androsace sempervivoids* | Primulaceae | Ashamkund | Abundant |
| 61. | *Primula macrophylla D.Don* | Primulaceae | Kaangla-Naakla, | Common |
| 62. | *Primula rosea Royle.* | Primulaceae | Mundaal, peetsevti | Common |
| 63. | *Cynanchum arnottianum* | Asclepiadaceae | Dudhad | Threatened |
| 64. | *Cynanchum auriculatum* | " | Dudhad | Threatened |
| 65. | *Gantiana marginata ( . Don)* | Gentianaceae | Neelkanth, Shirkanth | Common |
| 66. | *Nymphoides peltata (S.* | Menyanthaceae | Lidd khur | Common |
| 67. | *Asperugo procumbens L.* | Boraginaceae | - | Common |
| 68. | *Cynoglossum lanceolatum* | Asclepiadaceae | Khitdi | Common |
| 69. | *Onosma hispidum Wallich* | Asclepiadaceae | Ratanjot, loljad | Threatened |
| 70. | *Veronica biloba Linn.* | Scrophulariaceae | Titni | Common |
| 71. | *Veronica persica Poiret.* | Scrophulariaceae | Ashvashaak | Common |
| 72. | *Pedicularis pectinata Wallich* | Scrophulariaceae | Kankatyukaparn, | Common |
| 73. | *Orobanche solmsii C.B.Clark* | Orobanchaceae | Lothus, Jadkhaar | Common |
| 74. | *Petracanthus utricifolius* | Acanthaceae | Pardaad,Mauhwa, | Common |
| 75. | *Verbena officinalis Linn.* | Verbenaceae | Bareen | Abundant |
| 76. | *Nepeta erecta (Benth) Benth.* | Lamiaceae | Neelpat, Bidaal Parnaas | Common |

| | | | | |
|---|---|---|---|---|
| 77. | *Nepeta lacvigata (D.Don.)* | Lamiaceae | Neelpat, Gandhsoi | Common |
| 78. | *Rumex acetosa Linn.* | Plygonaceae | Ulloh, Tsoktsin | Common |
| 79. | *Rumex nepalensis Sprengel.* | Plygonaceae | Ubaj, Chooka | Abundant |
| 80. | *Euphorbia helioscopia L.* | Euphorbiaceae | Dudhi, Gur sutchsul, | Common |
| 81. | *Euphorbia plorifera hook f.* | Plygonaceae | Dudhli, Dudhi | Common |
| 82. | *Parieteria lusitanica linn* | Urticaceae | - | Common |
| 83. | *Epipactis royleana Lindley.* | Orchidaceae | Amarkand,phullchamba | Common |
| 84. | *Spiranthes sinensis* | Plygonaceae | Muchhmarool, | Abundant |
| 85. | *Iris germanica L.* | Iridaceae | Majaarmund, Sosem | Common |
| 86. | *Hemerocallis fulva Linn.* | Liliaceae | Riudd, Sunaari | Common |
| 87. | *Juncos articulatus Linn.* | Juncaceae | Pranad, Tillar | Common |
| 88. | *Carex stenophylla* | Cyperaceae | Phikal | Abundant |
| 89. | *Kobresia laxa Nees.* | Cyperaceae | Kubber | Threatened |
| 90. | *Scripus setaceus* | Cyperaceae | Kaseru, Ghussad | Common |
| 91. | *Eriocaulon cinereun* | Eriocaulaceae | Irka | Common |
| 92. | *Agrostis pilosula* | Poaceae | Ghaas | Abundant |
| 93. | *Datylis glomerata* | Poaceae | Trakkad, | Common |
| 94. | *Digitaria* | Poaceae | Chhal, Trakkad | Common |
| 95. | *Phleum alpinum* | Poaceae | Jaamno gha | Common |
| 96. | *Poa alpine Linn.* | Poaceae | Humulu, Shaadal | Common |

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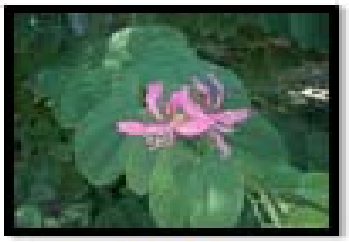

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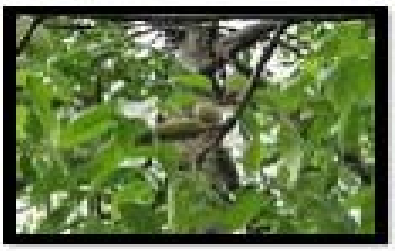

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**Agriculture/Crop Pattern:**

Agriculture land use includes two distant concepts: first is the functional use of land to meet human needs (e.g. agricultural, recreational, and residential) and second is the form of ground cover (e.g. crops, trees, houses). Agriculture regions may be categorized on the basis of land use. District Baramulla is also having three crop in combination with rice, wheat and barley as major crops. This part of Jammu division for a part of great plains of India and have good climatic condition, irrigation facilities accompanied by rich alluvial soil. Agriculturally this is rich belt of the province.

Jammu districts ranks first in production of wheat i.e. 48.67% area followed by rice, maize, bajara and pulses which occupies area of 28.87%, 9.9% , 5.91% and4.06% of total cropped area of the district respectively .In Udampur district maize is first ranking crop followed by wheat with 47.37% and 33.26% of the total area in hectare respectively .In districts of Rajouri, Poonch and Doda wheat is the first ranking crop with total of 46.41%,54.92% and 61.81% area under production of maize crop respectively. The reason being climatic conditions and irregular terrain. While district Baramulla rank first in production of wheat followed by rice i.e. 41.96% and 30.30% of area. Reason of rice cultivation being sub tropical type of climatic conditions any plain topography

Baramulla district is classified into three agro-climatic zones namely: Sub-Tropical (Up to 800m) which includes Plain areas with water logging conditions, Intermediate lower (800 to 1500m) which include Sloppy lands with problem of soil erosion and Intermediate higher (Above 1500 m) which include High hills with gully erosion.

**Table 3.15: Variety of Crops Recommend for 'Baramulla' District**

| **Crop name** | |
|---|---|
| Paddy (Dhan) | Gobhi Sarson |
| Wheat (Gehon) | Oat |
| Maize (Makka) | Sudan Grass |
| Pearl Millet (Bajra/Bulrush Millet/Spiked Millet) | Onion |
| Sorghum (Jowar/Great Millet) | Cabbage |
| Black Gram (Urd Bean) | Cauliflower |
| Bengal Gram (Gram/Chick Pea/Kabuli/Chana) | Knol-Khol |
| Green Gram (Moong Bean/ Moong) | Bitter Gourd |
| Lentil (Masur) | Bottle Gourd |
| Peas (Field Peas/ Garden Peas/Matar) | Cucumber |
| Groundnut (Pea Nut/Mung Phalli) | Indian Squash (Tinda/Round Melon) |
| Indian Rapeseed And Mustard (Yellow Sarson) | Brinjal |
| Raya (Indian Mustard) | Chillies |
| Sesame (Gingelly/Til) | Bhendi |

| | |
|---|---|
| Sunflower (Suryamukhi) | Tomato |
| Berseem (Egyptian Clover) | Fenugreek |
| Rajmash Bean | Spinach |
| Pea (Vegetable) | Radish |
| Coriander | Turnip (Saljam) |

**Table 3.16: Sacred plants of District Baramulla**

| Botanical Name | English | Hindi | Vernacular | Family |
|---|---|---|---|---|
| ***Ficus religiosa, L.;*** | Peepal Tree | Pipal; | Bar-Brahma; | Moraceae; |
| ***Mangifera indica, Linn.;*** | Mango | Aam | Amb | Anacardiaceae. |
| ***Butea monosperma, Kuntz.;*** | Dhak | Plash | Plah | Papilionaceae; |
| ***Ocimum sanctum, L.;*** | Holy Basil | Tulsi | Tulsi | Lamiaceae |
| ***Musa paradisiaca, Linn.;*** | Banana | Kela | Kela | Musaceae |
| ***Aegle marmelos, Corr.;*** | Bengal Quince | Bel | Bil-patri; | Rutaceae |
| ***Calotropis procera, R. Br.;*** | Swallow wart | Safed ak | Ak-datura | Asclepiadaceae |
| ***Cyanodon dactylon, (L.) Pers.;*** | Bermuda grass | Dub | Khabbal | Poaceae |
| ***Sesamum indicum, Linn.*** | Sesame | Til | Sanskrit Vila, | Pedaliceae |
| ***Hordeum vulgare, Linn.;*** | Barley | Sanskrit Yava | Jau | Poaceae |
| ***Dendrocalamus strictus, Nees.*** | Bamboo | Baans | Chuanthi | Poaceae |

| | | | | |
|---|---|---|---|---|
| ***Vitex negundo, L.;*** | -- | -- | Bana | Verbenaceae |
| ***Datura stramonium, Linn.;*** | Thorn Apple | Dhatura | Datura | Solanaceae |
| ***Saccharum officinarum, Linn.;*** | Sugarcane | Ganna | rusala | Poaceae |
| ***Jurinea macrocephala, (Royle) C.B. Clarke;*** | Incense Root | Guggal | Mundia-dhup | Asteraceae |
| ***Pyrus pashia, Ham.;*** | Elephant apple | -- | Kainth | Rosaceae |
| ***Punica granatum, Linn.;*** | Pomegranate | Anar-dana | Daduni | Punicaceae |

**Faunal biodiversity of study area**

The fauna of Jammu and Kashmir is diverse due to its unique location and climatic condition. About 16% of the Indian mammals, birds, reptiles, amphibians and butterflies are presented in the state. Birds contribute much to the chordate diversity following by mammals, reptiles, fishes and amphibians. The state is home to about ***75 species of mammals***, besides several sub-species, belonging to 54 genera, 21 families and 8 orders. Carnivores represent 32% of the total mammalian fauna in the state. Of the 19 species of the ungulates reported from the state, 13 have been listed as globally threatened.

The avian diversity of the state varies seasonally and available data suggests the existence of as many as ***358 species of birds*** belonging to 179 genera, 51 families under 16 orders. The state is home to ***14 species of amphibians*** belonging to 6 genera, 5 families and 1 order, and ***68 species of reptiles*** belonging to 43 genera, 12 families and 2 orders. The available data suggests that ***44 species of fishes*** belonging to 14 genera under 5 families occur in the state. The available data also reveals

that as many as ***225 species of insects***, besides several sub-species, belonging to 136 genera, 35 families and 4 orders occur in the state

**Birds:** Some of them even breed in the state.

**Table 3.17: List of Birds species**

| Family | COMMON NAME | Scientific Name | Status |
|---|---|---|---|
| **Family-Accipitridae** | | | |
| 1. | Black Kite | *Milvus migrans* | **R** |
| 2. | Sparrow Hawk | *Hiereatus nisus nisosimilis* | **RM** |
| 3. | Booted Eagle | *Hiereatus pennatus* | **RM** |
| 4. | Golden Eagle | *Aquila chrysaetos* | **R** |
| 5. | Eurasian Griffon | *Gyps fulvus* | **RM** |
| 6. | White-Rumped Vulture | *Gyps bengalensis* | **R** |
| 7. | Bearded Vulture | *Gypaetus barbatus* | **R** |
| **Family-Falconidae** | | | |
| 8. | Common Kestrel | *Falco tinnunculus* | **RM** |
| **Family- Phasianidae** | | | |
| 9. | Snow Partridge | *Lerwa lerwa* | **R** |
| 10. | Himalayan Snowcock | *Tetraogallus himalayensis* | **R** |
| 11. | Chukar | *Alectoris chukar* | **R** |
| 12. | Western Tragopan | *Tragopan melanocephalus* | **R** |
| 13. | Himalayan Monal | *Lophophorus impejanus* | **R** |
| 14. | Koklass Pheasant | | **R** |
| **Family-Columbidae** | | | |
| 15. | Snow Pigeon | *Columba leuconota* | **R** |
| 16. | Rock Pigeon | *Columba livia* | **R** |
| 17. | Oriental Turtle Dove | *Streptopelia orientalis* | **RM** |
| 18. | Eurasian Collared Dove | *Streptopelia decaocto* | **R** |
| 19. | Red Collared Dove | *Streptopelia tranquebarica* | **R** |
| 20. | Spotted Dove | *Streptopelia chinensis* | **R** |
| **Family-Psittacidae** | | | |
| 21. | Rose-Ringed Parakeet | *Psittacula krameri* | **R** |
| 22. | Slaty-Headed Parakeet | *Psittacula himalayana* | **R** |
| 23. | Indian Cuckoo | *Cuculus micropterus* | **RM** |
| 24. | Eurasian Cuckoo | *Cuculus canorus* | **RM** |
| **Family- Strigidae** | | | |
| 25. | Eurasian Eagle Owl | *Bubo bubo* | **R** |
| 26. | Little Owl | *Athene noctua* | **R** |
| 27. | Long-Eared Owl | *Asio otus* | **RM** |
| **Family- Aodidae** | | | |

| | | | |
|---|---|---|---|
| 28. | Himalayan Swiftlet | *Collocalia brevirostris* | **R** |
| 29. | Alpine Swift | *Tachymarptis melba* | **RM** |
| 30. | Common Swift | *Apus apus* | **M** |
| 31. | House Swift | *Apus affinis* | **RM** |
| **Family-Alcedinidae** | | | |
| 32. | Pied Kingfisher | *Ceryle rudis* | **R** |
| 33. | Common Kingfisher | *Alceodo atthis* | **RM** |
| 34. | White-Throated Kingfisher | *Halcyon smyrnensis* | **R** |
| **Family-Coraciidae** | | | |
| 35. | European Roller | *Coracias garrulus* | **RM** |
| **Family- Upupidae** | | | |
| 36. | Common Hoopoe | *Upupa epops* | **RM** |
| **Family- Picidae** | | | |
| 37. | Eurasian Wryneck | *Jynx torquilla* | **M** |
| 38. | Scaly-Bellied Woodpecker | *Picus squamatus* | **R** |
| 39. | Grey-Headed Woodpecker | *Picus canus* | **R** |
| 40. | Himalayan Woodpecker | *Dendrocopos himalayensis* | **R** |
| **Family- Alaudidae** | | | |
| 41. | Crested Lark | *Melanocorypha bimaculata* | **R** |
| **Family- Hirundinidae** | | | |
| 42. | Dusky Crag Martin | *Hirundo concolor* | **R** |
| 43. | Barn Swallow | *Hirundo rustica* | **RM** |
| 44. | Striated Or Redrumped Swallow | *Hirundo daurica* | **R** |
| **Family- Oriolidae** | | | |
| 45. | Eurasian Golden Oriole | *Oriolus oriolus* | **RM** |
| **Family- Surnidae** | | | |
| 46. | Common Starling | *Sturnus vulgaris* | **RM** |
| 47. | Common Myna | *Acridotheres tristis* | **R** |
| 48. | Jungle Myna | *Acridotheres fuscus* | |
| **Family- Corvidae** | | | |
| 49. | Yellow-Billed Blue Magpie | *Urocissa flavirostris* | **R** |
| 50. | Rufous Treepie | *Dendrocitta vagabunda* | **R** |
| 51. | House Crow | *Corvus splendens* | **R** |
| 52. | Large-Billed Crow | *Corvus macrorhynchos* | **R** |
| 53. | Nutcracker | *Nuctifraga caryocatactes* | |
| 54. | Yellow-Billed Or Alpine Chough | *Pyrrhocorax graculus* | |
| 55. | Eurasian Jackdaw | *Corvus monedula* | |
| 56. | Raven | *Corvus corax* | |

| | | | |
|---|---|---|---|
| 57. | Jungle Crow | *Corvus macrorphynchos* | |
| **Family-Pycnonotidae** | | | |
| 58. | White-Cheeked Bulbul | *Pycnonotus leucogenys* | |
| 59. | Black Bulbul | *Hypsipetes madagascariensis* | **R** |
| **Family- Muscicapidae** | | | |
| **Sub. Family- Timalinae** | | | |
| 60. | Jungle Babbler | *Turdoides striatus* | |
| 61. | Striated Laughing Thrush | *Garrulax striatus* | |
| 62. | Variegated Laughing Thrush | *Garrulax ariegatus* | |
| 63. | Streaked Laughing Thrush | *Garrulax lineatus* | |
| **Sub. Family-Muscicapinae** | | | |
| 64. | Kashmir Redbreasted Flycatcher | *Muscicapa subrubra* | |
| 65. | Little-Pied Flycatcher | *Muscicapa westermannt* | |
| 66. | White-Browed Blue Flycatcher | *Muscicapa supercillaris* | |
| 67. | Slaty Blue Flycatcher | *Muscicapa leucomelanura* | |
| 68. | Verditer Flycatcher | *Muscicapa thalassina* | |
| 69. | Grey-Headed Flycatcher | *Culicicapa ceylonensis* | |
| 70. | Paradise Flycatcher | *Terpsiphone paradist* | RM |
| **Sub. Family-Sylvina** | | | |
| 71. | Plain Leaf Warbler | *Phylloscopus neglectus* | **R** |
| 72. | Tytler's Leaf Warbler | *Phylloscopus tytleri* | **R** |
| 73. | Tickell's Leaf Warbler | *Phylloscopus affinis* | **R** |
| 74. | Sulphur-Bellied Warbler | *Phylloscopus griseolus* | **RM** |
| 75. | Yellow-Browed Warbler | *Phylloscopus inornatus* | **R** |
| 76. | Lemon-Rumped Warbler | *Phylloscopus chloronotus* | **R** |
| 77. | Blyth's Leaf Warbler | *Phylloscopus reguloides* | **RM** |
| 78. | Gold Crest | *Regulus regulus* | |
| **Sub. Family-Turdinae** | | | |
| 79. | Orange-Flanked Bush Robin | *Tarsiger cyanurus* | |
| 80. | Blue-Capped Redstart | *Phoenicurus caeruleocephala* | **R** |
| 81. | Black Redstart | *Phoenicurus ochruros* | **R** |
| 82. | White-Winged Redstart | *Phoenicurus erythrogastrus* | |
| 83. | Plumbeous Water Redstart | *Rhyacornisfuliginosus* | **R** |
| 84. | Little Forktail | *Enicurus scouleri* | **M** |
| 85. | Spotted Forktail | *Enicurus maculates* | |
| 86. | White-Capped Water Redstart | *Chaimarrornis leucocephalus* | **R** |
| 87. | Blue Rock Thrush | *Monticola solitarius* | **R** |

| | | | |
|---|---|---|---|
| 88. | Blue Whistling Thrush | *Myophonus caeruleus* | **R** |
| 89. | Grey-Winged Blackbird | *Turdus boulboul* | |
| 90. | Chestnus Thrush | *Turdus rubrocanus* | |
| **Family-Troglodytidae** | | | |
| 91. | Winter Wren | *Troglodytes troglodytes* | |
| **Family- Cinclidae** | | | |
| 92. | White-Throated Dipper | *Cinclus cinclus* | |
| 93. | Brown Dipper | *Cinclus pallasii* | |
| **Family- Prunillidae** | | | |
| 94. | Alpine Accentor | *Prunella collaris* | |
| 95. | Altai Accentor | *Prunella hamalayana* | |
| **Family- Paridae** | | | |
| 96. | Grey Tit | *Parus major* | |
| 97. | Green-Backed Tit | *Parus moniticolus* | |
| 98. | Crested Black Tit | *Parus melanolophus* | |
| 99. | Black Tit | *Parus rufonuchalis* | |
| 100. | Yellow-Cheeked Tit | *Parus xanthogenys* | |
| 101. | Fire-Capped Tit | *Cephalopyrus flammiceps* | |
| 102. | White-Throated Tit | *Aegithalos niveogularis* | |
| **Family- Sittidae** | | | |
| 103. | European Nuthatch | *Sitta europaea nagansis* | |
| 104. | White-Cheeked Nuthatch | *Sitta leucopsis* | |
| **Family-Certhidae** | | | |
| 105. | Tree Creeper | *Certhia familiaris* | |
| 106. | Himalayan Tree Creeper | *Certhia himalayana* | |
| Family-Motacillidae | | | |
| 107. | Yellow Wagtail | *Motacilla flava* | |
| 108. | Grey Wagtail | *Moctacilla cinerea* | |
| 109. | Pied Or White Wagtail | *Motacilla alba* | |
| 110. | Large Pied Wagtail | *Motacilla maderaspatensis* | |
| **Family-Zosteropidae** | | | |
| 111. | White Eye | *Zosterops palpebrosa* | |
| **Subfamily-Passerinae** | | | |
| 112. | House Sparrow | *Passer domesticus* | |
| 113. | Russet Sparrow | *Passer rutilans* | |
| 114. | Eurasian Tree Sparrow | *Passer montanus* | |
| **Family-Campephagidae** | | | |
| 115. | Scarlet Minivet | *Pericrocotus flammeus* | |
| 116. | Long-Tailed Minivet | *Pericrocotus ethologus* | |
| 117. | Small Minivet | *Pericrocotus cinnamomeus* | |
| **Family-Emberizidae** | | | |
| 118. | Pine Bunting | *Emberza leucocephalos* | |

| | | | |
|---|---|---|---|
| 119. | White-Capped Bunting | *Emberiza stewarti* | |
| 120. | Grey-Necked Bunting | *Emberiza bunchanani* | |
| 121. | Rock Bunting | *Emberiza cia* | |

**Butterflies:** Butterflies observed in the study area during study period. List of Butterflies are given Below:

**Table 3.18: List of Butterflies in the Study Area**

| Family | Common name | Scientific name | Status |
|---|---|---|---|
| Papilionidae | 1. Common Yellow Swallowtail | *Papilio machaon* (Linnaeus) | Common |
| Pieridae | 2. Large Cabbage White | *Pieris brassicae* (Linnaeus) | Common |
| | 3. Indian Cabbage White | *Pieris canidia* (Sparrman) | Common |
| | 4. Bath White | *Pontia daplidice* (Linnaeus) | Common |
| | 5. Common Gull | *Cepora nerissa* (Fabricius) | Common |
| | 6. Dark Clouded Yellow | *Colias fieldii* (Menetries) | Common |
| | 7. Common Brimstone | *Gonepteryx rhammi* (Linnaeus) | Common |
| | 8. Pale Clouded Yellow | *Colias erate* (Esper) | Common |
| Lycaenidae | 9. Common Copper | *Lycaena phlaeas* (Linnaeus) | Common |
| | 10. White-Bordered Copper | *Lycaena pavana Kollar* | Common |
| | 11. Dark Grass Blue | *Zizeeria karsandra* (Moore) | Common |
| | 12. Indian Cupid | *Everres lacturnus* (Godarts) | Common |
| | 13. Red Pierrot | *Talicada nyseus* (Guerin- meneville) | Common |
| | 14. Dusky Hedge Blue | *Oreolyce vardhana* (Moore) | Common |
| | 15. White Hedge Blue | *Udara akasa (Horsfield)* | Common |
| | 16. Plain Hedge Blue | *Celastrine Lavendularis (Moore)* | Common |
| | 17. White-Disc Hadge Blue | *Celatoxia albidisca (Moore)* | Common |
| | 18. Orange Bordered Argus | *Aricia astrarche (Bergsrasser)* | Common |
| | 19. Plains Cupid | *Chilades pandava (Horsfield)* | Common |
| | 20. Lime Blue | *Chilades lajus (Stoll)* | Common |
| Nymphalidae | 21. Common Beak | *Libythea lepita (Moore)* | Common |
| | 22. Club Beak | *Libythea myrrha (Godart)* | |
| | 23. Striped Tiger | *Danaus genutia (Cramer)* | Common |
| | 24. Plain Tiger | *Danaus chrysippus (Linnaeus)* | Common |
| | 25. Great Satyr | *Aulocera padma (Kollar)* | Common |
| | 26. Common Satyr | *Aulocera swaha (Kollar)* | Common |

| | | | |
|---|---|---|---|
| | 27. Common Fivering | *Ypthima baldus (Fabricius )* | Common |
| | 28. Common Fourring | *Ypthima huebneri (Kirby)* | Common |
| | 29. Himalayan Fivering | *Ypthima sacra (Moore)* | Common |
| | 30. Common Threering | *Ypthima asterope(Klug)* | Common |
| | 31. Large Threering | | Common |
| | 32. Western Fivering | | |
| | 33. Common Wall | | |
| | 34. Indian Fritillary | *Argyreus hyperbius (Linnaeus)* | Common |
| | 35. large silver stripe | *Chidrena children* | Common |
| | 36. Small Leopard | *Phalantha alcippe (Stoll)* | |
| Nymphalidae | 37. Common Leopard | *Phalanta phalantha (Drury)* | Common |
| | 38. Indian White Admiral | *Limenitis trivena (Moore)* | Common |
| | 39. Himalayan Sergeant | *Athyma opalina (Kollar)* | Common |
| | 40. Common Sailer | *Neptis hylas (Linnaeus)* | Common |
| | 41. Short-Banded Sailer | *Phaedyma columella (Cramer)* | Common |
| | 42. Indian Purple Emperor | *Apatura ambica (Kollar)* | Common |
| | 43. Painted Lady | *Vanessa cardui (Linnaeus)* | Common |
| | 44. Indian Tortoiseshell | *Aglais casmiriensis (kollar)* | Common |
| | 45. Mountain Tortoiseshell | *Aglais urticae (Linnaeus)* | Rare |
| | 46. Comma Tortoiseshell | *Nyphalis vau-albm* | Rare |
| | 47. Eastern Comma | *Polygonia egea (Cramer)* | Common |
| | 48. Blue Admiral | *Kaniska canace (Linnaeus)* | Common |
| | 49. Red Admiral | | |
| | 50. Blue Pansy | *Junonia orithia (Linnaeus)* | Common |
| | 51. Chocolate Pansy | *Junonia iphita (Cramer)* | Common |
| | 52. White Commodore | *Parasarpa dudu (Doubleday)* | |
| | 53. Ringed Argus | *Callerebia ananda (Moore)* | |
| | 54. Small Grass Yellow | | |
| | 55. Green-veined white | *Pieris napi (Linnaeus)* | |
| | 56. Himalayan Blackvein | *Aporia leucodice (Eversmann)* | |

**African Caper White butterfly**

**Lemon Emigrant butterfly**

**Common Grass Yellow butterfly**

**The Bath White butterfly**

**The Common Brimstone butterfly**

**The White orange tip butterfly**

**Table 3.19: Fauna Found in Study Area**

| S. No. | Common Name | Scientific Name | WL Schedule |
|---|---|---|---|
| 1. | Jackal | *Canis aureus* | - |
| 2. | Himalayan wolf | *Canis lupus* | I |
| 3. | Hangul or Kashmir Stag | *Cervus elaphus hanglu* | I |
| 4. | Jungle Cat | *Felis chaus* | - |
| 5. | Indian porcupine | *Hystrix indica* | - |
| 6. | Rhesus macaque | *Macaca mulatta* | - |
| 7. | Himalayan yellow-throated Marten | *Martes flavigula* | - |
| 8. | Himalayan Musk Deer | *Moschus chrysogaster* | I |
| 9. | Himalayan weasel | *Mustela sibirca* | - |
| 10. | Serow | *Capricornis sumatraensis* | I |
| 11. | Himalayan Mouse Hare | *Ochotona roylei* | - |
| 12. | Common Leopard | *Panthera pardus* | I |
| 13. | Leopard Cat | *Felis bengalensis* | I |

| | | | |
|---|---|---|---|
| 14. | Kashmir Gray Langur | *Semnopithecus ajax* | - |
| 15. | Himalayan Brown Bear | *Ursus arctos isabellinus* | I |
| 16. | Asiatic Black Bear | *Ursus thibetanus* | - |
| 17. | Red Fox | *Vulpes vulpes* | - |

**(Note:Conservation status of mammals according to IUCN categorization and Wildlife (Protection) Act, 1972 amended up to 2002.)**

### 3.7 Socio-Economic Environment

**INTRODUCTION**

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area. The geographical area is often called Study Area or Impact Area. SEIA is carried out simultaneously with Environment Impact Assessment (EIA). The prime objective of SEIA is to identify and evaluate potential socio-economic and cultural impacts of a proposed development project on the lives and conditions of people, their families and their communities. If the potential impacts are significant and adverse, SEIA assist the developers and other stakeholders to reduce, remove or prevent these impacts from happening. The objectives of the proposed SEIA are as follows:

- To identify and assess socio-economic activities, which may be influenced by mining of minerals like sand.
- To examine the perceptions of local people on mining of minerals.
- To suggest interventions that can assist the Government and other stake holders in mitigating the negative impacts of the proposed mining project.

Socio-economic study is multidisciplinary, using theories and methods from Sociology, Economics, History, Psychology, Geography etc. As per Notification dated 14th September, 2006 of the then Ministry of Environment & Forests (Since renamed as 'Ministry of Environment, Forests and Climate Change). Socio-economic impact assessment of the study area of a project is mandatory for all the listed projects classified under various sectors.

**STUDY AREA**

The study area, also known as Impact Area has been defined as sum total of core and buffer area with a radius of ten kilometres from the periphery of the project site. All the landmarks, be it natural or manmade, falling in the study area has been taken into consideration while undertaking the impact assessment study. The entire study area of the proposed mining project falls in the state of Jammu & Kashmir. There are 69 villages and no urban area in the study area.

The net – sown area consists of 64.9 percent of the study area. About 62.2 percent of the agricultural land is irrigated and the remaining 37.8 percent is rain fed un-irrigated land.

**HYPOTHESIS**

"River bed Mining" has significant socio-economic impacts on livelihoods of local communities".

**APPROACH**

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 also known as 'bottom top approach' or 'climbing the hill approach'. Under this approach data is first collected from primary and secondary sources. After scrutiny tables are generated in pre-designed formats. Subsequently, draft report is prepared after detail analysis of data. The final report is prepared after incorporating the comments and suggestions of the public during public hearing.

**METHODOLOGY**

Accordingly, both qualitative and quantitative data was collected through primary and secondary sources. For collection of primary data a Sample Survey was carried out in the study area.

The qualitative data deals with description; they can be observed but not measured. Hence, codes were extensively used during collection of qualitative data. They were decoded after data processing to facilitate data analysis and report writing.

**Sample Design**

In rural areas two stage stratified sample design were adopted. The first stage units were census villages and the ultimate stage units were households.

**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 a project. Any attempt to collect base line data while undertaking actual impact assessment study is faced with recall error. The baseline data was collected from secondary sources. It consists of demographic particulars and amenities. The data presented in the table below pertains to study area as a whole.

**Table 3.20: Demographic Particulars of the Study Area**

| S.No. | Description | Number | Percentage to Respective totals |
|---|---|---|---|
| 1 | **Gender wise Total Population of the Study Area** | **70061** | **100** |
| | Male | 36441 | 52.0 |
| | Female | 33620 | 48.0 |
| | Sex Ratio (No. of females per 1000 males) | 923 | |
| | Overall density of population (per sq. km) | 216 | |
| 2 | **Gender wise Total Population (0-6 age group)** | **10671** | **100** |
| | Male | 5727 | 53.7 |
| | Female | 4944 | 46.3 |
| | Sex Ratio of 0-6 age group population (No. of females per 1000 males) | 863 | |
| 3 | Gender wise Total Population (**0-14 age group)** | 26145 | 100 |
| | Male | 13659 | 52.2 |
| | Female | 12486 | 47.8 |
| | Sex Ratio of 0-14 age group population (No. of | 914 | |

| | | | |
|---|---|---|---|
| | females per 1000 males) | | |
| 4 | **Number of Households** | **15857** | |
| | Average Household size in the Study Area (Rural) as a whole | 4 | |
| | Highest Household size in the Study Area | 6 | |
| | Lowest Household size in the Study Area | 1 | |
| 5 | **Total Population of Schedule Caste Community in the Study Area** | **12789** | **100** |
| | Male | 6614 | 51.7 |
| | Female | 6175 | 48.3 |
| | Sex Ratio (No. Of females per 1000 males) | **934** | |
| 6 | **Total Population of Schedule Tribe Community in the Study Area** | **11932** | **100** |
| | Male | 6233 | 52.2 |
| | Female | 5699 | 47.8 |
| | Sex Ratio (No. Of females per 1000 males) | 914 | |
| 7 | **Total Population of General Category (including OBC) in the study area** | **45340** | **100** |
| | Male | 23594 | 52.0 |
| | Female | 21746 | 48.0 |
| | Sex Ratio of General Category Population in the study area | 922 | |
| 8 | **Total Literates in the Study Area** | **41183** | **100** |
| | Male | 24214 | 58.8 |
| | Female | 16969 | 41.2 |
| | Overall Literacy Rate in the Study Area | 69.3 | |
| | Male | 78.8 | |
| | Female | 59.2 | |
| | Gender gap in literacy rate | 19.7 | |

| | | | |
|---|---|---|---|
| 9 | **Total Workers in the Study Area** | **29095** | **100** |
| | Male | 18255 | 62.7 |
| | Female | 10840 | 37.3 |
| | **Overall Work Participation Rate in the Study Area** | **41.52** | |
| | Male | 50.09 | |
| | Female | 32.24 | |
| | Gender Gap in work participation rate | 17.85 | |
| | Overall Dependency Rate of Non-workers | **58.47** | |
| | Dependency Rate of Male Non-workers | 49.90 | |
| | Dependency Rate of Female Non-workers | 67.75 | |
| 10 | **Total Main Workers in the Study Area** | **20571** | **100** |
| | Male | 14184 | 68.9 |
| | Female | 6387 | 31.1 |
| | Overall Work Participation rate of Main Workers | 50.9 | |
| | Work Participation rate of males | 67.5 | |
| | Work Participation rate of females | 32.9 | |
| | Overall Gender Gap in Work Participation rate of main workers | 34.6 | |
| 11 | **Total Marginal Workers in the Study Area** | **8524** | **100** |
| | Male | 4071 | 47.8 |
| | Female | 4453 | 52.2 |
| | Overall work participation rate in the Study Area | 21.1 | |
| | Work participation rate of males | 19.4 | |
| | Work participation rate of females | 22.9 | |
| | Overall gender gap in work participation rate of Marginal workers | -3.5 | |
| 12 | **Total Household Industrial Workers in the Study Area** | **815** | **100** |

| | | | |
|---|---|---|---|
| | Male | 453 | 55.6 |
| | Female | 362 | 44.4 |
| | Overall work participation rate in the Study Area | 2.0 | |
| | Work participation rate of males | 2.2 | |
| | Work participation rate of females | 1.9 | |
| | Gender Gap in work participation rate of Household Industrial Workers | 0.3 | |
| 13 | **Total Agricultural Workers in the Study Area** | **24320** | **100** |
| | Male | 14890 | 61.2 |
| | Female | 9430 | 38.8 |
| | Overall work participation rate in Areas | 60.1 | |
| | Work participation rate of males | 70.9 | |
| | Work participation rate of females | 48.6 | |
| | Gender Gap in work participation rate of Agricultural Workers in the Study Area | 22.3 | |
| 14 | **Total Cultivators in the Study Area** | **10053** | **100** |
| | Male | 6781 | 67.5 |
| | Female | 3272 | 32.5 |
| | Overall work participation rate in the Study Area | 24.9 | |
| | Work participation rate of males | 32.3 | |
| | Work participation rate of females | 16.8 | |
| | Gender Gap in work participation rate of Cultivators in the Study Area | 15.5 | |
| 15 | **Total Agricultural Labour in the Study Area** | **14267** | **100** |
| | Male | 8109 | 56.8 |
| | Female | 6158 | 43.2 |
| | Overall work participation rate in the Study Area | 35.3 | |
| | Work Participation rate of males | 38.6 | |
| | Work Participation rate of females | 31.7 | |

| | | | |
|---|---|---|---|
| | Gender Gap in work participation rate of Agricultural Labour in Rural Area | 6.9 | |
| 16 | **Total 'Other Workers' in the Study Area** | **3960** | **100** |
| | Male | 2912 | 73.54 |
| | Female | 1048 | 26.46 |
| | Overall work participation rate in the Study Area | 9.8 | |
| | Work Participation rate of males | 13.9 | |
| | Work Participation rate of females | 5.4 | |
| | Gender Gap in work participation rate of Other Workers in the Study Area | 8.5 | |

**Source: Census 2011**

NB: All the rates and ratios provided in the above table have been compiled on the basis of Census 2011 demographic data.

**Current Socio-Economic Status**

**Population Composition**

According to 2011 Population Census the study area has a total population of 70061. Of this 52.0 percent are male and the remaining 48.0 percent are female. Further 15.2 percent of the total population belongs to 0-6 age group. About 53.7 percent of them are male and the remaining 46.3 percent are female.

**Sex Ratio**

The overall sex ratio in the study area has been worked out to 923 females per 1000 males, which is less than the national average of 940 females per 1000 males. The highest sex ratio recorded in the study area is 2000 females per thousand of males. Sex ratio of Children belonging to 0-6 age group has been worked out to 863 females per 1000 males.

**Density of Population**

The overall density of population in the study area has been worked out to 216 persons per sq. Kilometre.

**Households**

There are 15857 households in the study area and the average household size is four.

**Social Structure**

In the study area the total number of persons belonging to Scheduled Caste community is 12789, which is 18.3 percent of the total population. The gender wise distribution of schedule caste population indicates male 51.7 percent and female 48.3 percent, registering a sex ratio of 934 females per one thousand males.

Further analysis of data reveals that in the study area, the total number of persons belonging to Scheduled Tribe community is 11932, which is 17.0 percent of the total population. This is nearly same as the total number of persons belonging to Scheduled caste community residing in the study area.

About 64.7 percent of the total population belongs to General category, which includes people belonging to 'Other Backward Castes'. In absolute number the population belongs to this category are 45340 with 52 percent male and 48 percent female. The sex ratio of General category population has been worked out to 922 females per 1000 males.

**Literates and Literacy Rate**

The total numbers of literate persons in the study area are 41183, which is 58.8 percent of the total population. Of the total number of literate persons 58.8 percent are male and the remaining 41.2 percent are female.

The overall literacy rate in the study area has been worked out to 69.3 percent. The gender wise distribution of literacy rate reveals that 78.8 percent of the literate persons are male and 59. 2 percent are female. This creates a gender gap of 19.6 percent.

**Workers and Work Participation Rate**

A worker has been defined as a person who participates in a productive activity with or without compensation, wages or profit and such participation may be physical and/or mental in nature. A worker may be a main worker or a marginal worker. The main workers are those workers who had worked for the major part of the total working period.

The total number of workers in the study area has been worked out to 29095, which is 41.5 percent of the total population. Of the total number of workers 62.7 percent are male and the remaining 37.3 percent are female. The overall work participation rate is 71.9 percent. While the work participation rate of male is 86.9 percent, it is only 55.8 percent in the case of females. This creates a gender gap of 31.1 percent, which is significantly high. The Main workers constitute 70.7 percent of the total workers, while marginal workers constitute only 29.3 percent of the same. An analysis of data reveals male dominancy in Main workers (68.9 percent) and female dominancy (52.2 percent) in case of Marginal workers. This was as expected. The females prefer to work as marginal workers as they have very little time to spare for other work outside their houses as they are to undertake household work besides rearing their children. The total number of main and marginal workers in the study area is 20571 and 8524 respectively.

Further classification of the workers has revealed that in the study area 83.5 percent of the total workers are agricultural workers, 2.9 percent are household industrial workers and the remaining 13.6 percent are 'Other Workers'. Furthermore, of the total agricultural workers about 41.3 percent are Cultivators and the remaining 58.7 percent are Agricultural Labour. About 67.5 percent of cultivators are male and the remaining 32.5 percent are female. On the other hand, 56.8 percent of Agricultural labours are male and the remaining 43.2 percent are female. It may be observed from the above figures that participation of women in agriculture both as cultivators and agricultural Labour is far below in comparison to their male counterpart. This also confirms that in agriculture women work more as agricultural labours than as cultivators. The agricultural labours are mostly landless. They work in the field of big farmers for which they get wages or part of the produce. The wages of women agricultural labour is miserably low in comparison to their male counterpart, though they put same amount of hard work as the male does. The 'Other Workers' include white collar workers, blue collar workers, pink collar workers, informal workers, etc.

**Dependency Ratio**

Based on total number of workers gainfully employed and non-workers either in search of a job or very old & retired or physically handicapped or mentally retarded or students continuing their studies or people who have no intention to work, the overall dependency rate has been worked out to 58.47 percent.

**AMENITIES**

Based on information collected from secondary sources various amenities available in the study area are provided in the table below.

**Table 3.21: Amenities available in the Study Area**

| Sr. No. | Description | Number of habitations where the facility is available | | Number of institutions/facilities available in the habitations | |
|---|---|---|---|---|---|
| | | Villages | Towns | Villages | Towns |
| **(A)** | **INSTITUTIONAL EDUCATIONAL FACILITIES** | | | | |
| **1** | **Pre - Primary School** | **14** | - | **22** | - |
| 1(a) | Only Private Pre – Primary School | 14 | - | 22 | - |
| **2** | **Primary School** | **74** | - | **114** | - |
| 2(a) | Only Govt Primary School | 61 | - | 80 | - |
| 2(b) | Both Govt. And Private Primary School | 13 | - | 34 | - |
| **3** | **Middle School** | 48 | - | **62** | |
| 3(a) | Only Govt Middle School | 40 | - | 43 | - |
| 3(b) | Both Govt And Private Middle School | 8 | - | 19 | - |
| **4** | **Secondary School** | **20** | - | **23** | - |
| 4(a) | Only Govt Secondary School | 16 | - | 16 | - |
| 4(b) | Only Private Secondary School | 1 | - | 1 | - |
| 4(c) | Both Govt And Private Secondary School | 3 | - | 6 | - |
| **5** | **Senior - Secondary School** | 9 | - | 10 | - |

| | | | | | |
|---|---|---|---|---|---|
| 5(a) | Only Govt. Senior Secondary School | 8 | - | 8 | - |
| 5(b) | Both Govt And Private Senior Secondary School | 1 | - | 2 | - |
| | **Total No. Of Schools** | **165** | - | **231** | - |
| **(B)** | **HEALTH INSTITUTIONS AND HEALTH PERSONNEL** | | | | |
| **B.1** | **HEALTH INSTITUTIONS** | | | | |
| 1 | Primary Health Centre | 3 | - | 3 | - |
| 2 | Primary Health Sub Centre | 13 | - | 13 | - |
| 3 | Dispensary Numbers | 12 | - | 12 | - |
| 4 | Hospital Alternative Medicine | 2 | - | 2 | - |
| 5 | Veterinary Hospital | 19 | - | 19 | - |
| | **Total** | **49** | - | **49** | - |
| **B.2** | **NUMBER OF DOCTORS IN HEALTH INSTITUTION** | | | | |
| 1 | Primary Health Centre Doctors Total Strength | 3 | - | 13 | - |
| 2 | Hospital Alternative Medicine Doctors Total Strength | 2 | - | 2 | - |
| 3 | Dispensary Doctors Total Strength | 12 | - | 12 | - |
| | Total | 17 | - | 27 | - |
| **B.3** | **NUMBER OF PARA MEDICAL STAFF IN HEALTH INSTITUTION** | | | | |
| 1 | Primary Health Centre Para Medical Staff Total Strength | **3** | - | **2** | - |
| 2 | Primary Health Sub Centre Para | **4** | - | **4** | - |
| 3 | Hospital Alternative Medicine Para Medical Total Strength | **2** | - | **2** | - |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Dispensary Para Medical Staff Total Strength | **12** | - | **15** | |
| 5 | Number of ASHAs | **57** | - | **57** | |
| | **Total** | **78** | - | **80** | - |
| **(C)** | **Others Medical Practitioners** | | | | |
| 1 | Non Govt Medical Practitioner With No Degree | 2 | - | 3 | - |
| 2 | Non Government Medical facilities Out Patient | 21 | - | 32 | |
| 3 | Non Government Medical facilities In And Out Patient | 4 | - | 4 | |
| 4 | Non Government Medical facilities Medical Practitioner with MBBS Degree | 6 | - | 7 | |
| 5 | Non Government Medical facilities Medical Practitioner with other Degree | 7 | - | 15 | |
| 6 | Non Government Medical facilities Medical Practitioner with no Degree | 13 | - | 16 | - |
| 7 | Non Government Medical facilities Medicine Shop | 4 | - | 6 | |
| | **Total** | **57** | - | **83** | |
| **(D)** | **Veterinary Hospital** | **19** | - | **19** | |
| **(E)** | **DRINKING WATER FACILITIES** | | | | |
| **1** | **Wells** | **6** | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| 1(a) | Only Covered Wells | 6 | - | - | - |
| **2** | **Tube Wells** | **47** | **-** | **-** | **-** |
| **3** | **Hand Pump** | **25** | **-** | **-** | **-** |
| **4** | **Tap Water** | **82** | **-** | **-** | **-** |
| 4(a) | Treated And Untreated Tap Water | 7 | - | - | - |
| 4(b) | Only Treated Tap Water | 75 | - | - | - |
| **5** | **Tank / Pond / Lake** | **3** | **-** | **-** | **-`** |
| **6** | **Spring** | **1** | **-** | **-** | **-** |
| **(F)** | **Transport And Communication** | | | | |
| 1 | Telephone (landlines) | 68 | - | - | - |
| 2 | Public Call Offices | 35 | - | - | - |
| 3 | Post Office | 11 | - | - | - |
| 4 | Sub Post Office | 10 | - | - | - |
| 5 | Availability Of Mobile Phone Coverage | 82 | - | - | - |
| 6 | Public Bus Service | 73 | - | - | - |
| 7 | Private Bus Service | 40 | - | - | - |
| 8 | Taxi | 5 | - | - | - |
| **(G)** | **ELECTRICITY** | | | | |
| **1** | **Total No. Of Settlements Having Power Supply** | **82** | **-** | **-** | **-** |
| 1(a) | Power Supply For All Uses | 82 | - | - | - |

| | | | | | |
|---|---|---|---|---|---|
| **(H)** | **ROADS** | | | | |
| **1** | **Rural Areas** | | | | |
| 1(a) | Gravel (Kutchha) and Foot Roads | 1 | - | - | - |
| 1(b) | Black Topped, Gravel (Kutchha)And Foot Roads | 41 | - | - | - |
| 1(c) | Black Topped And Foot Roads | 40 | - | - | - |
| | **Total** | **82** | - | - | - |
| **(I)** | **Banking and Credit facilities** | | | | |
| 1 | Commercial Banks# | 1 | - | - | - |
| 2 | Cooperative Bank | 8 | - | - | - |
| 3 | Agricultural Credit Societies | 12 | - | - | - |
| 4 | Agricultural Marketing Society | 4 | - | - | - |
| | **Total** | **25** | - | - | - |
| **(J)** | **Other Facilities** | | | | |
| 1 | Self Help Group Status | 75 | - | - | - |
| 2 | Public Distribution Status | 56 | - | - | - |
| 3 | Nutritional Centres-ICDS | 75 | - | - | - |
| 4 | Nutritional Centres-Anganwadi Centre | 82 | - | - | - |

The data given in the above table reveals that the basic amenities available in the study area are far from satisfactory. Nearly eight of the inhabited villages are without any school and the children from these villages are forced to go to the nearby villages where schools are available. There is no institution for higher education located in the study area. Lastly, the study area is devoid of facilities for adult education as there is no adult literacy centre as such.

The health facilities available in the study area are very poor and require upliftment. There are government run five PHCs, CHCs, a Maternity & Child Welfare Centre and Two Dispensaries to meet the needs of the rural people. There are in all 27 medical practitioners in the study area and the

number of persons per doctor has been worked out to 3640 which is very low and should be considered as a matter of concern.

The tap water has reached all inhabited villages out of which seven have treated and untreated water.

The accessibility of mobile signals has covered all the inhabited villages.

Out of total villages all villages have been provided with power supply for all uses. However, frequent load shedding during summer months need to be checked by ensuring uninterrupted supply of power.

There are 40 villages in the study area where there are black topped and foot roads, in 41 villages there are all types of roads are present and only one village with gravel and foot road. Hence, the construction of black topped and gravel roads in the above villages needs to be taken up on priority basis as the roadways are the backbone of social-economic development of people in a region.

The entire study area is served by one commercial bank. Besides the above there are 12 Agricultural credit societies and four Agricultural Marketing Societies. The aforesaid financial institutions provide cheap credit facilities to the local people engaged in agriculture, trade and industry. Hence the promising entrepreneurs can start micro and small industries in the region.

**PERCEPTION OF LOCAL PEOPLE**

During the course of site visit people living in the nearby villages were requested to express their views about the up-coming mining project in district Baramulla in Jammu & Kashmir. Irrespective of the distance of the villages from the mining site they all supported it. However, people living in the study area stated that extraction of minerals will be allowed with the following conditions:

a) All the persons to be deployed for extraction and recruited locally from villages near mine lease area and in no case outsiders be engaged for the purpose.
b) Mining should be allowed strictly during day time and there should be no mining activity after the sun sets.
c) There should not be any pilling of sand and other minerals for deferred sale. The piling of sand and other minerals create environment pollution.

d) The mud road connecting the quarry with the Tar road should be well maintained and there should not be any pothole or uneven surface. This will ensure speedy transportation of sand and other minor minerals from the quarry to the end users.

e) The local communities must be involved while implementing the CSR activities.

f) The CSR activities should be carried on under the supervision of a team drawing members from the affected villages.

**Conclusion**

During the course of the study social factors were identified that may influence the socio-economic life of the people in the study area. Except one all of them are positive impacts, which are expected to improve the quality of life of the local people. Beside the above the mining will bring revenue to the state government.

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## 4.0 GENERAL

Identification of all potential environmental impacts due to project is an essential step of Environmental Impact Assessment. In case of mining projects, impacts on biodiversity, air pollution, water pollution, waste management and social issues are significant. Both direct and indirect environmental impacts will be created on various environmental attributes due to proposed mining activity in the surrounding environment, during the operational phase.

The occurrence of sand (minor mineral) deposits, being site specific, their exploitation often does not allow for any choice except adoption of eco-friendly operation. Positive impacts on socio-economic environment are expected due to creation of employment opportunities. Mining activities are normally carried out over a long period which also encourages development in the area such as roads, schools, hospitals etc.

Keeping in mind, the environmental baseline scenario as detailed in Chapter III and the proposed mining activity described in Chapter II, it is attempted to assess the likely impact and its extent on various environmental parameters and likely mitigation measures to be adopted.

The following parameters are of significance in the Environmental Impact Assessment and are being discussed in detail:

1. Land Environment
2. Water Environment
3. Air Environment
4. Noise Environment
5. Biological Environment
6. Socio-Economic Environment
7. Solid Waste
8. Traffic Environment

## 4.1 LAND ENVIRONMENT

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out scientific & systematically.

The mining and allied activities involved due to mining result in creation of temporary haul roads and formation of mined pits, etc. affecting the land use pattern. In this project, silt and clay are also produced as a constituent along with minerals, which are considered to be waste.

**Anticipated Impacts:**

- Mining activity will impact river bed topography by formation of excavation voids.
- River bed mining may bring in some change in topography at the nearby area of the mine lease.
- Stacks of solid waste generated from mining activity may hinder the flow of water in monsoon season.

**Mitigation measures:**

Adopting suitable, site-specific mitigation measures can reduce the degree of impact of mining on land. Some of the land-related mitigation measures are as follows:

- Excavated pits will get replenished annually in monsoon itself & will be restored to original.
- The mine working will remain confined to allotted river bed only, so it will not disturb any surface area outside the mine lease area which may affect topography or drainage.
- Solid waste will not be stacked on the bank side as it will hinder the flow of water in monsoon season.

## 4.2 WATER ENVIRONMENT

**Anticipated Impacts:**

Mining of sand from within or near *river* has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the *river*
- An excess of suspended sediment during monsoon season.

**Mitigation measures**

Project activity will be carried out only in the dry part of the Nallah Ferozpora. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *River* (in monsoon) or tapping the ground water.

In the lean months, the proposed mining will not expose the base flow of the *River* and hence, there will not be any adverse impact on surface hydrology.

Further mining will be completely stopped during the monsoon seasons to allow the excavated area to regain its natural profile.

## 4.3 AIR ENVIRONMENT

The proposed project includes various activities like approach roads, haul roads, excavation and transportation of sand. These operations generally result in generation of dust and thereby pose health hazards. However, it is proposed that adequate control measures will be provided at every stage of operation such as, water sprinkling at loading, unloading points and on haul roads before transportation to reduce the fugitive dust emissions.

The mining is proposed to be carried out by opencast Semi- mechanized method. The air borne particulate matter ($PM_{10\ \&\ 2.5}$) generated by transportation of sand is the main respirable air pollutant. The emissions of Sulphur dioxide ($SO_2$), Nitrogen Oxides ($NO_2$) contributed by vehicles plying on haul roads will be marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions.

**Mitigation measures**

The collection and lifting of minerals will be done by loaders. Therefore, the dust generated is likely to be insignificant as there will be no drilling & blasting. The only air pollution sources are the road transport network of the trucks. The mitigation measures like the following will be resorted:

- ✓ Water sprinkling will be done on the haul roads twice in a day.
- ✓ Deploying PUC certified vehicles to reduce their emissions
- ✓ Proper tuning of vehicles to keep the gas emissions under check
- ✓ Monitoring to ensure compliance with emission limits would be carried out during operation

- ✓ There is no major source of emissions except emission from combustion of fuels from the Transportation Vehicles and Material Handling.
- ✓ Besides this, to control the emissions further regular preventive maintenance of Equipment / Transportation Vehicles will be carried out on contractual basis.
- ✓ It will be ensured that all transportation vehicles carry a valid PUC certificate.
- ✓ Plantation will be carried out along the approach road, river banks & at all strategic places in the vicinity area.
- ✓ Periodic air quality monitoring will be done to assess the quality and for timely corrective actions.
- ✓ Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74%
- ✓ Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
- ✓ Spillage from the trucks will be prevented by covering tarpaulin over the trucks.

## 4.4 NOISE ENVIRONMENT

The proposed mining activity is semi-mechanized in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals.

**Anticipated Impacts:**

- Mental disturbance, stress & impaired hearing.
- Decrease in speech reception & communication.
- Distraction and diminished concentration affecting job performance efficiency.

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, Damage risk criteria for hearing loss OSHA regulations**

| Maximum allowable duration per day in hour | Sound pressure dB(A) | Remarks |
|---|---|---|
| **(1)** | **(2)** | **(3)** |
| 8.0 | 90 | 1. 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 extrapolation or proportionate scale.<br>2. No exposure in excess of 115 dB (A) is permissible. |
| 6.0 | 92 | |
| 4.0 | 95 | |
| 3.0 | 97 | |
| 2.0 | 100 | |
| 1 ½ | 102 | |
| 1 | 105 | |
| ¾ | 107 | |
| ½ | 110 | |
| ¼ | 115 | |

Noise at lower levels (sound pressure) is quite acceptable and does not have any bad effect on human beings, but when it is abnormally high- it incurs some maleficent effects.

### a. Mitigation measures

The following measures have been envisaged to reduce the impact from the transportation of minerals:

- The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.
- In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
- No such machinery is used for mining which will create noise to have ill effects.

- Awareness will be imparted to the workers about the permissible noise levels & maximum exposure to those levels.

## 4.5 BIOLOGICAL ENVIRONMENT

Mining which leads to the removal of channel substrate, re-suspension of streambed sediment and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities. Sand mining generates additional traffic, which negatively impairs the environment.

**Anticipated Impacts:**

**Flora**

The proposed project of river bed sand mining shall be carried out on the riverbed of Nallah Ferozpora. There are no trees in the project area. The project shall also not lead to any change in land use and will be replenished every year after successive rains. The proposed mining activity, which although is an economically gainful activity, also constitutes river training work. It allows for necessary dredging activity which may otherwise lead to flooding of the valley.

There shall be negligible air emissions or effluents from the project site during loading of the truck. This shall be a temporary effect and not anticipated to affect the surrounding vegetation significantly.

**Fauna**

Animals are sensitive to noise and avoid human territory. The project stretch of the river is not an identified drinking water point for the animals. However, any animal desirous of accessing the river can continue to do so upstream or downstream of the stretch during the mining activities, as there will not be any damming or diverting of water. Hence, no significant impact is anticipated from the proposed project.

**Anticipated Impacts:**

- Excessive and unscientific mining results in the destruction in the channel morphology.
- Reduction in the yield of agriculture due to deposition of dust on the leaves, etc. of the crops.
- Fragmentation of wildlife habitat and blocking of migratory paths/corridors. Isolation may lead to local decline of species, or genetic.

- Mining on the streambed, braided flow or subsurface inter-sand flow may hinder the movement of fishes between pools.

**Mitigation measures**

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated, however, the following mitigation measures will be taken to further minimize it:

1. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
2. As the mining site has no vegetation, no clearance of vegetation will be done.
3. Prior to closure of mining operations / during the rainy season the eroded bank will be restored / reclaimed to minimize negative impacts on aquatic habitats.
4. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.
5. No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
6. No night time mining will be allowed which may catch the attention of wild life.
7. If wildlife are noticed crossing the area, they will not be disturbed at all.
8. Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.

**Flora**

Although, the project will not lead to any tree cutting, plantation activities shall be undertaken to improve the vegetation cover of the area. To avoid dust emissions, the mined materials will be covered with tarpaulin during transportation.

**Fauna**

The workers shall be directed to not venture out of the leased area for collecting fuel wood, or hunting. They shall also be trained not to harm any wildlife. No work shall be carried out after sunset.

## 4.6 TRAFFIC ANALYSIS

**Transportation Route:**

The sand extracted will store the nearby storage point. From there sand will be transported to the market. As in present area there are number of sand mining, it is not feasible to transport sand

directly to the market as it will increase traffic in the area. Due to above reason it has been proposed that some trucks will be send directly to the market by using two transportation path and rest sand will be stored in to storage point and from there it will be transported in the night time when traffic load is low on nearest SH or NH.

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 Traffic Scenario & LOS**

| Road | V | C | Existing V/C Ratio | LOS |
|---|---|---|---|---|
| Srinagar Gulmerg road | 350 | 2,000 | 0.17 | A |

*Source: Capacity as per IRC: 64-1990*

V= Volume of Vehicles in PCU's/day & C= Capacity of Road in PCU's/day

The existing Level of Service (LOS) is "A" & ''B'' i.e. excellent & very good.

| V/C | LOS | Performance |
|---|---|---|
| 0.0 - 0.2 | A | Excellent |
| 0.2 - 0.4 | B | Very Good |
| 0.4 - 0.6 | C | Good / Average / Fair |
| 0.6 - 0.8 | D | Poor |
| 0.8 - 1.0 | E | Very Poor |

*Reference: ENVIS* Technical Report, IISc, Bangalore.

**During Mine operation**

Proposed Capacity of mine/annum : **1,92,400** TPA

No. of working days : 270 days

Proposed Capacity of mine/day : 712.59 TPD

Truck Capacity : 20 tonnes

No. of trucks deployed/day : 36

PCU/day (36*3) : 108

**Table 4.2 (ii): Modified Traffic Scenario & LOS**

| Road | V | C | Modified V/C Ratio | LOS |
|---|---|---|---|---|
| Srinagar Gulmerg Road | 350+108 = 458 | 2000 | 0.23 | B |

**Results**

From the above analysis it can be seen that the LOS for Srinagar Gulmerg Road that is 'A' (Excellent') will be changed from "A" (Excellent') to "B" (Very good) . Hence, there will not so much adverse affect on the proposed evacuation roads due to additional traffic. But due mining in the area there is heavy load in the study area hence it has been proposed to use to alternative transportation path. Traffic management has been proposed as given below.

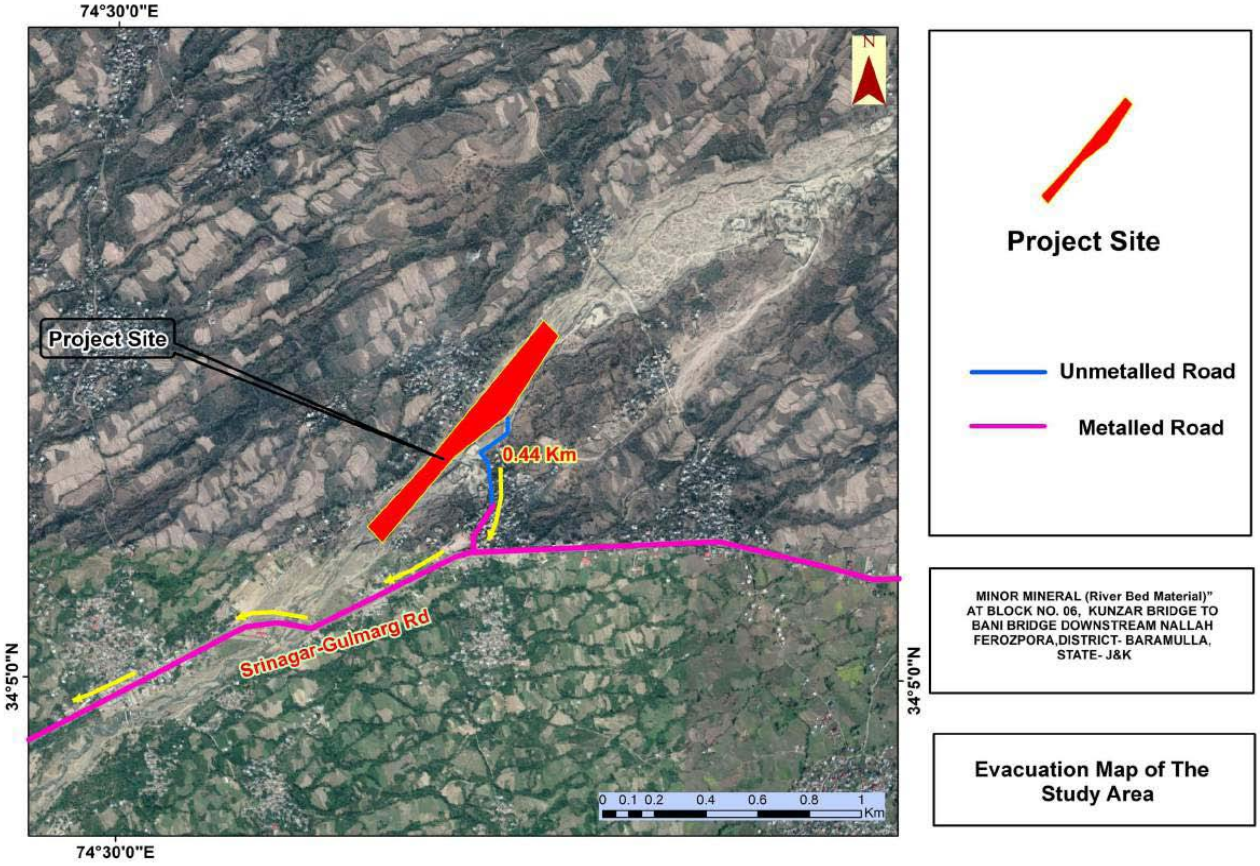


**Fig 4.1, Evacuation route map**

**Traffic Management:**

1. Roads will be repaired regularly and maintained in good conditions.
2. Haul roads will be sprinkled with water to keep the dust suppressed.
3. A supervisor will be appointed to regulate the traffic movement near the site.
4. Speed breakers will be constructed near accident prone areas to calm the traffic and its speed.
5. Signage will be erected at the sensitive & precarious places to caution or provide information to road users.

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# 5.0 ANALYSIS OF ALTERNATIVE TECHNOLOGY AND SITE

## 5.1 Site Alternatives under Consideration

Presence of sand for commercial exploitation has been identified based on the result of geological investigations and exploration. The mining projects are site specific as such alternate sites were not considered.

## 5.2 Analysis of Alternative Technology

### 5.2.1 Choice of Method of Mining

Factors in the choice of an actual mining method for a given deposit are deposit characteristics, requirement of health and safety and environmental concerns, production, scheduling scope of mechanization, workforce requirements wage rates, replenishment, 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 cast mining is used for large, near-surface mineral deposits. Mineral is exploited, loaded into trucks, and hauled to a market.

The open cast Method will be adopted because of the following reasons:

- The open-cast mining operations ensure higher mineral conservation.
- Replenishment

The method used for mining is efficient for sand mining, so no alternative mining method is proposed.

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## 6.0 INTRODUCTION

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.

## 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 programmes and to develop appropriate control measures. Suspended Particulate Matter (SPM), Sulphur Dioxide ($SO_2$) and Nitrogen Dioxide ($NO_2$) will be monitored at the workplace i.e. core zone. The methodology proposed for is shown below:

**Table 6.1, Monitoring methodologies and parameters**

| **Parameters** | **Technique** | **Technical Protocol** |
|---|---|---|
| $PM_{10}$ | Gravimetric method | **IS 5182 (Part-XXIII)** |
| Sulphur Dioxide | Improved West and Gaeke | **IS-5182 (Part-II)** |
| Nitrogen Dioxide | Modified Jacob & Hochheiser | **IS-5182 (Part-VI)** |

**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 the 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 generating 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 6.2, Details of monitoring schedule**

| S.No. | Description of Parameters | Schedule of Monitoring |
|---|---|---|
| **1** | Air Quality | 24 hourly samples twice a week for one month in each season except monsoon will be collected at the mine site and nearby villages and analyzed. |
| **2** | Water Quality (Surface & Groundwater) | Once a season for 4 seasons in 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.

Implementation of proposed control measures and monitoring programme has an implication on mining site as well as on the surrounding area. Therefore, mine management should strengthen the existing control measures as elaborated earlier in this report and monitor the efficacy of the control measures implemented in the entire study area:

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 every two years and analysis thereof with regard to deleterious constituents, if any.
c) 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.
d) Measurement of noise levels at mine site 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 allotment has also been proposed for the same:

**Table 6.3, Budget Allocation For Monitoring**

| S. No. | Description | Cost to be incurred (in lakhs/annum) |
|---|---|---|
| **1** | Water Quality (Surface & Groundwater) | 1.0 |
| **2** | Soil Quality | 0.5 |
| **3** | Air Quality | 1.0 |
| **4** | Noise Level | 0.5 |
| **5** | Plantation Monitoring | 0.5 |
| **6** | Socio-economic Condition | 0.5 |
| **TOTAL** | | **4.0** |

## 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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## 7.0 PUBLIC CONSULTATION

### 7.1 PUBLIC HEARING

As per EIA Notification dated 14th September, 2006, as amended from time to time. The committee has suggested various Terms of Reference (ToRs) for the preparation of the Environmental Impact Assessment (EIA) Report and Environmental Management Plan (EMP) vide their letter no. JKEIA/2021/587/4512-16 dated 26.11.2021. The following Additional Studies were carried out as per Terms of Reference:

1. Public Hearing
2. Risk Assessment &
3. Disaster Management Plan

### 7.1 PUBLIC HEARING

Public hearing has been conducted as per EIA Notification for the proposed River bed mining of Minor Minerals Block No.06 in Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora, District Baramulla, Jammu and Kashmir dated 17-03-2022 at Town Hall Municipal Committee, Kunzer Tanmarg, District- Baramulla. J & K.

**Table 7-1, Public hearing details**

| Particular | Description |
|---|---|
| Advertisement for Public Hearing<br>➢ Date of Advertisement in Newspapers | 15/02/2022 |
| Date of Public Hearing | 17th March, 2022 |
| Venue | At Town Hall Municipal Committee, Kunzer Tanmarg, District- Baramulla. J & K |
| Members | • Additional District magistrate, Baramulla.<br>• District Mining Officer, Department of Geology & Mining Baramulla.<br>• Divisional Officer, Pollution Control Committiee Baramula.<br>• Representtative from Reginal Office JK PCC Kashmir & Others.<br>• Tehsil Kwarhama Abdul Aziz.<br>• President MC Kunzer Abdul Gani Dar. |

The Technical Consultant briefed the public about the purpose of organizing the hearing and asked the project proponent to explain the salient features of project with specific reference to the impacts on environment, its management and social welfare measures including community development activities proposed.

The public hearing proceedings & related papers are attached as **Annexure-XII.**

### 7.1.1 Issues rose during public hearing and commitment

Action plan to address the issues raised during public hearing is discussed in **Table-7.2**.

### 7.1.2 Conclusion on public hearing

After the questions raised by the public present during the public hearing, were suitably replied to their satisfaction and no further questions were coming, the Addl. Deputy Commissioner, Reasi briefly addressed the public and Divisional Officer declared the Public Hearing as over. The details of persons attended and representations received in writing during the public hearing are enclosed along with the minutes of the public hearing.

**Table 7-2, Details of action plan for the issues raise during the public hearing**

| S. No. | Applicant's Name | Issued raised by the applicant | Answers given by mine management | Action Plan |
|---|---|---|---|---|
| **1** | Mohammad Shafi Sheikh | He expressed that Mining with depth upto twenty feet to being coated particularly in Block 06 near Kunzer Town. He requested administration for proper Identification of mining land fixation of rate list for sand, Bajri & aggregates from Stone Crushers. He was also of the opinion that local manual Manpower & local transport | Environment consultant replied that mining will be carried out only upto 1.0 m depth. Local villagers will be given preference in employment & local transport will be used. | -- |

| | | | | |
|---|---|---|---|---|
| | | should be used in mining. | | |
| **2** | Shafqat Mohi Ud Din R / o Khore : | He raised Issue of Corporate Social responsibility, royalty of material, Issue of Fast driving by Tippers / Tractor drivers .He also expressed his apprehensions about impact of mining on the irrigation facility of Agricultural Land which may get affected due to mining . | Environment consultant replied that 2 % of project cost will be allocated under CER budgtet which will be used for development. activities in village. Trippers or tactors will be run within limited speed. The proposed project will not lead to adverse impact on iagricultural Land as Regular water sprinkling will be carried out | About 3.4 lakh/annum has been allocated under CER budget. |
| **3** | Nambardar Lalpora Ghulam Mohammad Rather: | He raised issue of safety of Hardabani -Lalpora Bridge which may get damaged due to the mining. The Nambardar Requested to Distrct Adminsitration That the Mining for blocks should be done legally & in accordance with the rules and opputunity should be given to the local laborers for the said job . | Environment consultant replied that it is a legal mine & mining will be carried out as per rule & regulations. Local villagers will be given employment on priority basis. Mining will be carried out after leaving safety barrier from bridge with rule & regulation. | |

| | | | | |
|---|---|---|---|---|
| **4** | Abdul Rahman Wani R / o Lalpora : | He urged that land records should be checked before mining is permitted. Further he expressed no objection for legal mining operations in the area Extraction should be done from the Bed leaving safety zone from Banks.The River Bed material should be given to the adjacent villagers on nominal rates . | Environment consultant replied that it is a legal mine. Mining will be carried out leaving safety zone from Banks & concession will be given as per discussion with the village panchayat head. | -- |
| **5** | Ashiq Gulzar R / o Khore : | He welcomed mining of Block 08 which as per his views will facilitate the area in keeping a fixed material rate. He facilitated, welcomed the initiative taken by Government for systematic, legal minor mineral mining. He also underscore the importance of irrigation facility that needs to be protected during mining. | Environment consultant replied that it is a legal mine. Mining will be carried out leaving safety zone from Banks & concession will be given as per discussion with the village panchayat head. | -- |
| | Abdul Majeed Khanday: | As per his views, extraction of material from Block 06 would damage bridges over Nallah. The irrigation canals and both embankments should be protected during mining River Bed Material should be given to the locals, shrines on concessional rates | Mining will be carried out after leaving safety barrier from bridge with rule & regulation. Concession will be given as per discussion with the village panchayat head. | - |
| | DHO | DMO Baramulla advised the | Environment | |

| | | | | |
|---|---|---|---|---|
| | Baramulla Poer Zahid Ahmad JAS : | queries of audience with regard to overcharging by the lessees, using unscientific methods of mining etc.He assured audience that strict legal action shall be initiated against those who Indulge in any sort of malpractice with regard to legal mining of minerals . | consultant replied that it is a legal mine and scientific method will be adopted in all mining activities | |
| 8 | Tehsildar Kawarhama Abdul Aziz : | He highlighted Importance of the outsourcing of mining by conceding that it has made regulation of process easy. He however expressed his reservation for not consulting revenue staff during auctioning of Blocks in 2019 | -- | |
| **9** | President MC Kunzer Abdul Gani Dar: | He welcomed Public Hearing event conducted by JK PCC Baramulla. He requested concerned Tehsildar for proper demarcation of Mining Land .He stressed that three Bridges on Nallah at Block 06 should not get affected, Illegal mining should be banned. He assured full cooperation of Institution with administration in Legal mining. | Environment consultant replied that it is a legal mine and scientific method will be adopted in all mining activities. Mining will be carried out after leaving safety barrier from bridge with rule & regulation. | |
| **10** | ADC Baramulla | He thanked J & K PCC for conducting Public Hearing for | Environment consultant replied that it is a legal | |

| | | | | |
|---|---|---|---|---|
| | Dr. Zahoor Ahmad Raina JKAS : | Environmental Clearance of Minor Mineral Blocks. The participants, especially the project proponent, and local administration were sensitized about the concerns raised by the speakers with regard to the following important aspects associated with the mining process in Block 6 & 8.<br><br>a. No llegal mining shall be allowed in the blocks .<br><br>b. The depth of the mining shall be limited to permissible depth of One meter .<br><br>c. That District Administration will not allow Illegal mining & advised audience to avoid illegal means of mining.<br><br>d. That unskilled manpower shall be engaged by Project Proponent to assure employment opportunity.<br><br>e. That Bridges falling in the mining areas shall be taken care of on top priority to avoid Public Loss and no mining within 500 meters distance on both sides of | mine and no llegal mining shall be allowed.<br>The depth of the mining will be 1.0 m only.<br>Local villagers will be given employment on priority basis.<br>Mining will be carried out after leaving safety barrier from bridge with rule & regulation. | |

| | | | | |
|---|---|---|---|---|
| | | bridge piers shall be undertaken . | | |

## 7.2 HAZARD IDENTIFICATION AND RISK ASSESSMENT METHODOLOGY

Risk is to expose someone or something to danger, harm or loss. The different steps of risk assessment procedure are as given below:

**Step I: Hazard Identification**

The purpose of hazard identification is to identify and develop a list of hazards for each job in the organization that are reasonably likely to expose people to injury, illness or disease if not effectively controlled. Workers can then be informed of these hazards and controls put in place to protect workers prior to them being exposed to the actual hazard.

**Step II: Risk Assessment**

Risk assessment is the process used to determine the likelihood that people exposed to injury, illness or disease in the workplace arising from any situation identified during the hazard identification process prior to consideration or implementation of control measures.

Risk occurs when a person is exposed to a hazard. Risk is the likelihood that exposure to a hazard will lead to injury or health issues. It is a measure of probability and potential severity of harm or loss.

**Step III: Risk Control**

Risk control is the process used to identify, develop, implement and continually review all practicable measures for eliminating or reducing the likelihood of an injury, illness or diseases in the workplace.

**Step IV: Implementation of risk controls**

All hazards that have been assessed should be dealt in order of priority in one or more of the following hierarchy of controls

The most effective methods of control are:

- ✓ Elimination of hazards.
- ✓ Substitute something safer.
- ✓ Use engineering/design controls.

- ✓ Use administrative controls such as safe work procedures.
- ✓ Protect the workers i.e. by ensuring competence through supervision and training, etc.

Each measure must have a designated person assigned for the implementation of controls. This ensures that all required safety measures will be completed.

**Step V: Monitor and Review**

Hazard identification, risk assessment and control are an on-going process. Therefore regularly review the effectiveness of your hazard assessment and control measures. Make sure that you undertake a hazard and risk assessment when there is change to the workplace including when work systems, tools, machinery or equipment changes. Provide additional supervision when the new employees with reduced skill levels or knowledge are introduced to the workplace.

**A) RISK ANALYSIS**

The risk assessment portion of the process involves three levels of site evaluation:

a) Initial Site Evaluation,

b) Detailed Site Evaluation,

c) Priority Site Investigations and Recommendations.

The risk assessment criteria used for all levels of site evaluation take into account two basic factors:

The existing site conditions

The level of the travelling public's exposure to those conditions.

The Initial Site Evaluation and Detailed Site Evaluation both apply weighted criteria to the existing information and information obtained from one site visit. The Initial Site Evaluation subdivides the initial inventory listing of sites into 5 risk assessment site groups. The Detailed Site Evaluation risk assessment is then performed on each of the three highest risk site groups in order of the group priority level of risk. The result of the Detailed Site Evaluation process is a prioritized listing of the sites within each of the three highest risk site groups.

**Risk analysis is done for:**

- Forecasting any unwanted situation
- Estimating damage potential of such situation
- Decision making to control such situation

- Evaluating effectiveness of control measures

**Table 7.1, Risk Likelihood Table for Guidance**

| **Step 1: Assess the Likelihood** | | | | **Step 2: Assess the Consequences** | | |
|---|---|---|---|---|---|---|
| **L1** | Happens every time we operate | Almost Certain | Common or repeating occurrence | **C1** | Fatality | Catastrophic |
| **L2** | Happens regularly (often) | Likely | Known to have occurred "has happened" | **C2** | Permanent disability | Major |
| **L3** | Has happened (occasionally) | Possible | Could occur or "heard of it happening" | **C3** | Medical/hospital or lost time | Moderate |
| **L4** | Happens irregularly (almost never) | Unlikely | Not likely to occur | **C4** | First aid or no lost time | Minor |
| **L5** | Improbable (never) | Rare | Practically impossible | **C5** | No injury | Insignificant |

A logical systematic process is usually followed during a qualitative risk assessment to identify the key risk events and to assess the consequences of the events occurring and the likelihood of their occurrence Table 7.1(ii)

**Table 7.2, Qualitative Risk Assessment**

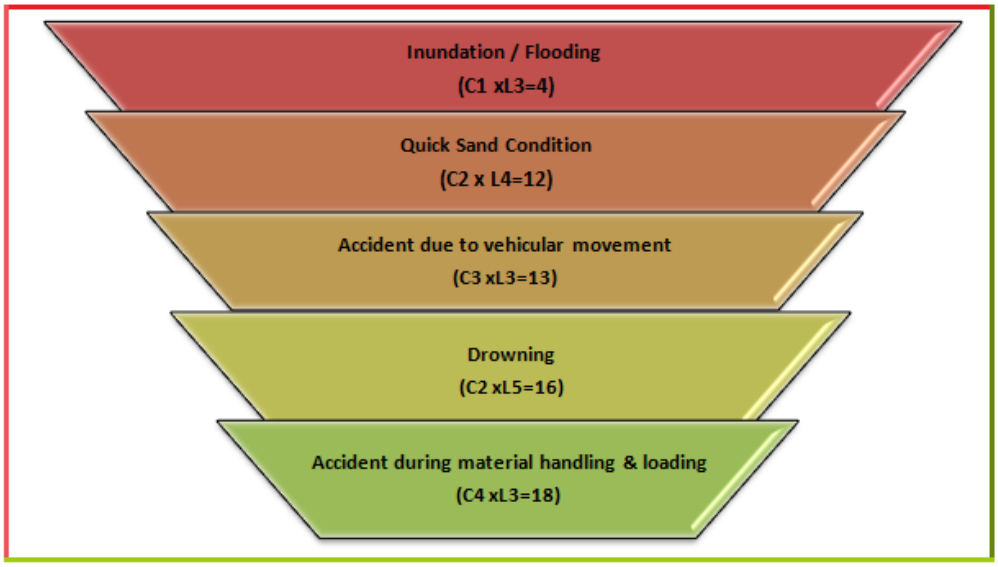
| **Risk Rank**<br>**Likelihood Consequence** | **L1**<br>**Almost certain** | **L2**<br>**Likely** | **L3**<br>**Possible** | **L4**<br>**Unlikely** | **L5**<br>**Rare** |
|---|---|---|---|---|---|
| **C1**<br>**Catastrophic** | **1** | **2** | **4** | **7** | **11** |
| **C2**<br>**Major** | **3** | **5** | **8** | **12** | **16** |
| **C3**<br>**Moderate** | **6** | **9** | **13** | **17** | **20** |

| | | | | | |
|---|---|---|---|---|---|
| **C4 Minor** | **10** | **14** | **18** | **21** | **23** |
| **C5 Insignificant** | **15** | **19** | **22** | **24** | **25** |

**RISK RATING:**

| | | |
|---|---|---|
| **HIGH RISK 1-6** | **MEDIUM RISK 7-15** | **LOW RISK 16-25** |

## 7.3 RISK ASSESSMENT




There are various factors, which can create unsafe working conditions/hazards in mining of minor minerals from bed of river.

The key risk (hazard x probability) event rating associated with sand mining and to assess its consequences of such events occurring and the likelihood based on above Table 7.1 (ii) are as:-

The Risk rating of such hazards is as follows:

**INUNDATION/FLOODING**

The risk rating assigned to this activity is assigned as '4' i.e., it is possible and will have catastrophic with major consequences, if work started without assessment of the *river* condition especially during monsoon season.

Inundation or flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished.

**Measures to prevent consequences of inundation/flooding**

Inundation of flooding is expected and beneficial for these mines as during this time only the mineral reserve gets replenished.

1. During monsoon months and heavy rains the mining operations are ceased.
2. There should be mechanism/warning system of heavy rains and discharges from the upstream dams.

**Quick Sand Condition**

The risk rating assigned to this activity is assigned as '12' i.e., it is an unlikely event with major consequences as frequency of this risk is less likely to occur.

Two things may create the conditions to form quicksand. Underground water may seep-up and saturate the sand, thereby reducing the friction between the sand grains and giving the sand a liquid nature. Or, sand or another soil may be sifted by the force of an earthquake so that friction is lessened and the earth becomes unsteady.

This creates danger condition to the trucks plying near the *river* and banks for transportation of minerals.

**Measures to Prevent Quick Sand Condition**

1. The only way to avoid quick sand condition is by avoiding mineral lifting below water table.
2. Mining will be done in layers rather than going for maximum depth at one time.

**ACCIDENT DUE TO VEHICULAR MOVEMENT**

The risk rating assigned to this activity is assigned as '13' i.e., it is possible event with moderate consequences as frequency of this operation is more but the predicted/assumed intensity is less like minor cuts, bodily injury. The possibilities of road accidents are due to reckless or untrained driver or overloading of trucks or in case pathway is not compacted suitably, etc.

**Measures to Prevent Accidents during Transportation**

1. All transportation within the main working should be carried out directly under the supervision and control of the management.
2. The Vehicles will be maintained/repaired and checked thoroughly by the competent person.
3. A statutory provision of constant education, training etc. will go a long way in reducing the incidents of such accidents.
4. Overloading will not be permitted and will be covered with tarpaulin.
5. The maximum permissible speed limit will be ensured.
6. The truck drivers will have valid driving license.

**DROWNING**

The risk rating assigned to this activity is assigned as '16' i.e., it is a rare accident but will have major consequences, if occurred. This may occur due to flash floods etc due to which the workers at the site may get seriously injured or drowned.

**Measure to Prevent Drowning**

1. The mining will be done under strict supervision and only in the dry part of the *river*.
2. Mining will be completely stopped in monsoon season to avoid such accidents.
3. Deep water areas will be identified and 'No Go Zones' will be clearly marked and made aware to the mine workers.

**ACCIDENT DURING MATERIAL HANDLING & LOADING**

The risk rating assigned to this activity is assigned as '18' i.e. it is possible event with minor consequences", as frequency of this operation is more but the predicted/assumed intensity is less like minor cuts, abrasion, etc. may be due to bank of *river* collapse, over thrown boulders/pebbles, injuries due to carelessness use of hand tools, etc.

**Measures to Prevent Accidents during material handling & loading**

1. The truck should be brought to a lower level so that the loading operation suits to the ergonomic condition of the workers.
2. The loading should be done from one side of the truck only to avoid over throw of materials.
3. The workers should be provided with gloves and safety shoes during loading.

All the activities will be done under strict supervision/control to avoid anticipated accidents so that the risk is reduced to a level considered **As Low As Reasonably Practicable** (**ALARP**) conditions which are adequately safe and healthy.

## 7.4 DISASTERS & ITS MANAGEMENT

**Anticipated Disaster**

1. **Floods**: Most of the areas of this district are flood prone owing to the presence of seasonal rivers. Rivers and its tributaries cause heavy losses to the human lives, livestock, land and property mainly due to flash floods. Hence no mining has been proposed during monsoon and flood alerts will be given, if any.
2. **Earth Quake**: Jammu District like other areas of Jammu & Kashmir is moderately vulnerable to earthquake as it exists in Zone III. However the vulnerability to damage near the site is quite low as there are no built in structures at the site.

**Drought**: due to deficiency in rainfall prime reasons of recurring drought in Jammu & Kashmir is the nature of soil with low mineral and humus-contents besides extremely poor water holding capacity. Recurrent rainfall variability and sustained departure from the normal rainfall vis-a-vis low reliability, fluctuating both surface and underground water resources and extremely poor water holding capacity of the major soil group appear to have clubbed together to cause frequent droughts in Jammu & Kashmir. Beside, there is a positive relationship between reducing forest land and the increasing rainfall variability and the phenomenon is well manifested in Jammu & Kashmir scenario of recurrent droughts.

**Disaster Management Plan & Strategy**

The Disaster Management Plan of the Jammu District has three components:

**(A) Risk Analysis and Vulnerability Assessment:**

The Risk Analysis and Vulnerability Assessment depict the present picture for each disaster-exposure, loss of life, property damage, etc. It also shows geographic distribution of each hazard. The various monitoring facilities, regulatory regimes, countermeasures available for each disaster are identified and listed.

**(B) Response Plan:**

The response plan presents an organizational structure of the District to effectively handle the disaster in a coordinated and quickest possible manner to mitigate the impact of disaster. It identifies functional areas such as relief, restoration, communication, information, transport, emergency health services etc and proposes assignments to various departments; including identifying lead and supporting departments. The response plan also lays down preparedness checklists and standing operating procedure (SOP) guidelines.

**(C) Mitigation Strategy:**

The mitigation strategy and plan focus on the long-term planning for impact reduction. It deals with the issues of continued commitment to hazard identification and risk assessment, applied research and technology transfer, investment- incentives for mitigation, and leadership and co-ordination for mitigation.

The mine management will be in regular contact with the District administration to gather information on natural disasters and will pass on the message at the site to avoid any loss of health or wealth due to impending disasters.

Though the responsibility of disaster management is vested with the center and state Governments, it is extremely difficult for them to deal effectively all the aspects of disaster management according to the needs of the affected people.

Thus disaster management plan of the Jammu District has been prepared through incorporation of the features of Community Based Disaster Management and involvement of local governments, Municipalities etc.

## 7.5 SOCIO-ECONOMIC IMPACT OF THE PROJECT & SAFETY MEASURES

### INTRODUCTION

Socio-Economic Impact Assessment (SEIA) refers to systematic analysis of various social and economic characteristics of human being living in a given geographical area during a given period. The geographical area is often called Study Area or Impact Area. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). The study area consists of core area where the project is located and a buffer area encircling the project area with a radius of 10 km from the

periphery of the core area. For every new project or existing project under expansion or tied for modernization or change in product mix, Socio-economic Impact Assessment is mandatory. The Socio-economic impact assessment focuses the effect of the project on social and economic well-being of the community. The impact may be direct or indirect. Further, the impact may be positive or negative.

**OBJECTIVES OF EIA**

The prime objective of the current study is to assess the impact of the proposed mining project on socio-economic characteristics of people living in the neighborhoods. Further, it is to be established whether the impending impact would be direct or indirect. Furthermore, it is to be examined whether the said impact would be positive or negative. Lastly, it is to be comprehended if the impact is positive how long it would sustain or if it is negative how soon the same could be eased.

**SCOPE**

The Scope of the study is as follows:

a) To collect baseline data of the study area
b) To comprehend socio-economic status of the people living in the study area.
c) To assess probable impact of the project on social and economic aspects in the study area.
d) To measure the impact of the project on Quality of life of the people living in the study area.
e) To ensure sustainability of positive impact.
f) To suggest mitigation measures and agency responsible for taking action in case of adverse impact.

**SOCIO-ECONOMIC IMPACT OF THE PROJECT**

***Impact on Demographic Composition***

The proposed Project will hardly make any difference in the demographic composition of the study area as the additional employment it envisages to create will be met locally to the maximum extent. Hence, the chances of in-migration of people from outside the study area are remote. Accordingly, there will be no variation in the total population of the study area including that of sex ratio, when the mine starts operating.

***Employment Opportunities***

The proposed Project will provide employment to the local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers will be recruited locally. It has estimated that around 12 people will get employment in this mining project for a period of ten months in a year. It is a positive impact of the project since it is providing employment opportunities to the local people. The project will not affect the vulnerable groups of people.

***Increased supply of sand in the market***

The demand for minerals is ever increasing with the growth of the infrastructure development in our country. Both Government departments and private developers have taken up construction of roads, bridges and buildings in a big way. The requirement for the building materials is always high and there is already an acute shortage of sand in the market and the construction industry is the main sufferer. With the commencement of the proposed mining project the supply of minerals will increase and the gap between demand & supply will decrease to some extent, if not fully.

***Impact on agriculture***

It is non-forest land and the proposed activity is to take place in the bed of the Nallah Ferozpora. There will be no negative impact on agriculture as no cultivation is taking place on the proposed mining area. Since, scientific mining will be adopted in the proposed mining project the area will be free from annual floods, which destroy standing crops and land & property. This is a positive impact of the proposed mining project.

***Impact on road development***

Movement of trucks and other vehicles to and fro the mining site is expected to increase, when mining will start. The existing roads are connecting the quarry with the national highway connected by metalled followed by un-metalled roads. Hence, there is need for road maintenance and repairing regularly in the mining area. Further, there are risks of accidents during loading of extracted minerals into trucks and transportation to markets for sells. However, accidents can be avoided by taking due care and precautions.

**Income to Government**

The proposed mining activity will benefit the State in the form of royalty, dead rent, fees and earnings from taxes.

**Impact on Law & Order**

As most of the workers to be employed in the proposed mining project are local residents no law & order problem is envisaged. It is expected that the workers will attend to their duties from their residence and return to their homes after the day's work. There would have been law & order problem if the workers were migrants and lived in shanties closed to the mining area. However, to meet any untoward incident one police post may be set up closed to the mining site.

**Impact on Health**

There are no chances of occurring diseases, due to mining. The minerals excavated are non-toxic. To avoid respiratory problem from dust necessary protection should be taken.

***Few safety measures are outlined below:***

a) **Safe Working Environment**: The project proponent shall ensure health and safety of all the employees at work. Efforts will be made to provide and maintain a safe work environment and ensure that the machinery and equipment in use is safe for employees. Further, it will be ensured that working arrangements are not hazardous to employees.

b) **Provision of First Aid**: The first aid treatment reflects the hazards associated with the mining of minerals. The first-aiders will be well trained in handling patients working in the Project.

c) **Regular Health Examination:** For all mine workers regular health examination will be made compulsory. Treatment of serious back injury; existing asthma or respiratory diseases, existing skin diseases, lung function test (pre and post ventolin), Audiograms, Chest X- ray etc. will also be taken care of.

d) **Health Education:** Adequate health education and information related to the job will be provided to the workers. Baseline health information will be recorded for future references.

e) **Tie-up with the Nearest Hospital for Medical Assistance:** To meet the medical needs of the mine workers tie-up with nearest hospitals will be made. Efforts will be made to reserve few beds in the above hospitals for the workers of the mining project. This will ensure timely medical aid to the affected persons.

f) **Supply of Mask and Gloves:** The workers in the Sand mining project are subject to respiratory diseases. For protection from dust it will be made compulsory for all workers to wear masks and gloves, while working in the mine.

g) **Administration of Anti-venom Injections:** Provision of Anti-venom therapy will be made available for administration to the workers in case of snake, spider and insect bites, while working in the mine.

h) **Special Telephone Number:** A special telephone number will be made available to the workers in case of emergency so that they can dial the same for–medical assistances. Further, efforts will be made to provide vehicles to the patients in short duration for shifting to a hospital.

i) **Special Group Insurance Scheme:** All the mine workers will be covered under a Group Insurance Scheme of LIC or any other Insurance company.

**CONCLUSION**

The commissioning of the Cluster Situations provides employment to local people who are in search of the same. The granting of environment clearance to proponents make mining of sand legally valid and it will generate revenue for the state. It is expected that prospective entrepreneurs will venture to set up industrial units in the vicinity in the near future making the area a mixed society, dependent on industry, trade and business. With the implementation of the project the occupational pattern of the people in the area will change making more people engaged in mining, industrial and business activities rather in agriculture only. The study area is still lacking in health and educational facilities. It is expected that same will improve to a great extent with opening of the project and associated industrial & business activities.

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## 8.0 GENERAL

Various benefits are envisaged while planning for the mining of sand from Nallah Ferozpora Bed. Sand is very important minor mineral and is the principal raw material for meeting the huge demand of construction material required in building construction and infrastructure works, road material for construction and maintenance of roads / highway; elastic ballast material for rail tracks in the State of J&K and nearby cities and towns of Jammu. The natural available materials in shoal deposits of Nallah Ferozpora bed quarry site have been found suitable from techno-economic consideration.

## 8.1 PHYSICAL BENEFITS

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 minor mineral sand will provide a good market opportunity.
c. **Enhancement of green cover:** As a part of reclamation plan, plantation will be carried along the river banks 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 centre, community centre, market place etc, as a part of corporate social responsibility.

## 8.2 SOCIAL BENEFITS

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 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.

**Table-8.1, Budget for Public health**

| S. No. | Activities recommended for communities level services | Tentative cost (Lakh Rs) |
|---|---|---|
| 1 | Awareness campaigns regarding health issues in the nearby villages. | **2.0** |
| 2 | Provide free health checkups & medicines to the nearby villagers of the project site. | **2.0** |
| 3 | Assistance to set up a temporary health center during the lease tenure. | **1.0** |
| | **Total** | **5.0** |

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.

f) Regular health check up of the labour will be done.

**Table 8.2, Budget for Occupational Health**

| Particulars | Recurring Cost per year (Rs.) |
|---|---|
| For occupational health checkup | 1,00,000 |
| **Total** | **1,00,000** |

**Table 8.3, Budget for water, shelter and sanitation for mine worker**

| Scheme | Capital Cost (In Rs) | Recurring Cost (In Rs) |
|---|---|---|
| Drinking water facility | 1,00,000 | 50,000 |
| Rest shelter | 1,00,000 | 10,000 |
| Sanitation (Urinal and Toilet) | 1,00,000 | 15,000 |
| **Total** | **3,00,000** | **75,000** |

## 8.3 ENVIRONMENTAL BENEFITS

a. Protection of banks
b. Reducing submergence of adjoining agricultural lands due to flooding.
c. Reducing aggradations of river level.
d. Protection of crops being cultivated along the bank.
e. A check on illegal mining activity.

## 8.4 CORPORATE ENVIRONMENTAL RESPONSIBILITY

2% of the total project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people. **Rs. 3.40 lakhs.**

For each activity the funds to be earmarked by the proponent has been decided after discussion with the local authority/people and the beneficiaries during Public Hearing. It has been planned to undertake a concurrent evaluation of the activities to be taken up under the CER programme.

**Table 8.4: CER Cost of mines**

| S. No | Project activities | Activities | Annual Budget Proposed by Proponent (in lacs) | Remarks |
|---|---|---|---|---|
| **1** | Health | Free Distribution of medicines, health check-up Installation of hand pumps/ Distribution of sanitizer's, gloves & N95 masks to nearby village | 2.00 | |
| **2** | Drinking waterfacility | Drinking water facility in nearby village/ Installation of hand pumps panchayat/ Installation of hand pumps | 0.00 | |
| **3** | Electrification | Solar Lamp distribution & Solar street light installation | 0.00 | |
| **4** | Sanitation | Construction of ladies' toilets in the village. | 1.40 | |
| **5** | Education | Distribution of school bags & books in nearby Primary School Education Grants to girl child to check drop outs in schools. | 0.00 | |
| **TOTAL** | | | **3.40** | |

**Table 8.5: Budget for Surveillance**

| S no. | Particulars | Capital Cost (In Lakhs) | Recurring Cost (In Lakhs) | Remarks |
|---|---|---|---|---|
| **1.** | Transport Permit | 2.0 | - | - |
| **2.** | CCTV Camera | 1.0 | 0.10 | |
| **3.** | Weight Bridge | 10.00 | 1.00 | |
| **4.** | Personal Computer with power backup | 0.50 | 0.05 | |
| **5.** | Mobile Application Barcode | 0.50 | 0.05 | |

| | | | | |
|---|---|---|---|---|
| | scanner | | | |
| **6.** | Radio Frequency Identification Tag(RFID) and GPS | 1.00 | 0.10 | |
| **7.** | Annual Audit of lease | - | 0.70 | |
| **8.** | Security Guard | - | 0.80 | |
| **Total** | | **15.00** | **2.80** | |

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## 9.0 PROJECT COST

The total Project cost for the proposed mining in Block No. 06, Kunzar Bridge to Bani Bridge, Downstream, Nallah Ferozpora over an area of 9.62 ha at Village- Kunzar, Tehsil- Tangmarg, District- Baramulla, UT Jammu & Kashmir is Rs. 229.7 Lakhs.

**Based on the production the cost may vary.*

**Table 9. 1: Project Cost and Benefit**

| Major Heads | Total |
|---|---|
| **Production Capacity** | 1,92,400 MTPA |
| **Production Cost of Mineral** | Rs 50 per Ton |
| **Cost of selling** | Rs 95 Per Ton |
| **Profit** | Rs 3,18,64,000 (3 year) |

## 9.1 ENVIRONMENT COST ANALYSIS AND PROJECT IMPLEMENTATION

The Environment cost for this proposed mining includes Environmental Management Plan, Environmental and Social Responsibility, Occupational Health and Safety which is likely to come Rs. 44.4 Lakhs per annum. The detailed cost for Environmental Expenses is given below in the Table**.**

**Table 9. 2: Cost for Environmental Expenses**

| S. No. | Major Heads | Expenses per annum (Lakhs Rs) |
|---|---|---|
| **1** | Environmental Management Plan (Recurring cost @5% of the project cost) including Occupational Health and Safety | Capital 22 Lakhs and Recurring 19 Lakhs. |
| **3** | Corporate Social Responsibility | 3.40 |
| | **Total** | **44.4** |

The estimated capital cost and financial viability of the present scheme has been worked out on the assumption that the above scheme shall be completed after five years i.e. end of lease period.

From the above financial analysis, it is clear that this mining project is financial and technically viable.

## 10.0 INTRODUCTION

The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse effects are minimized. The Environmental Management Plan (EMP) consists of a set of monitoring programme, mitigation measures, and management control strategies to minimize adverse environmental impacts.

The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations. Measures to be taken for each of the impact areas are detailed in the following paras:

## 10.1 ENVIRONMENTAL MANAGEMENT CELL (EMC)

It is imperative to establish an effective organization to implement, maintain, monitor and control the environmental management system. A separate Environmental Management Cell (EMC) will be formed to look after the environment related matter of the mine. The structure of EMC is as follows:

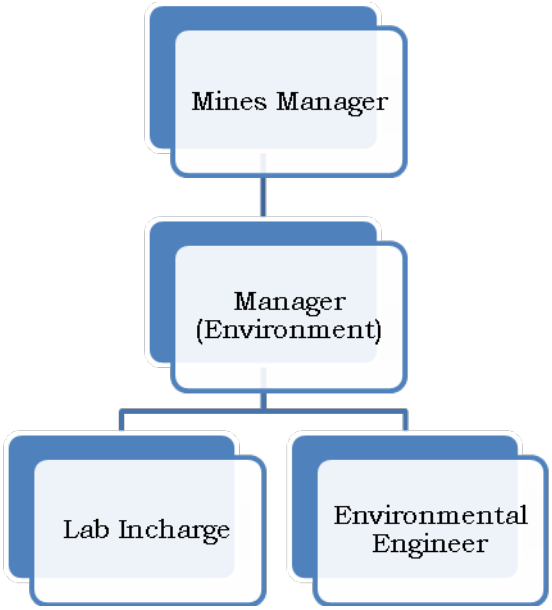


**Figure 10.1 Environment Management Cell**

The EMC will perform the following activities:

- EMC will oversee that environmental control measures are implemented as per the plan.
- EMC will ensure ambient Field monitoring like air monitoring, meteorological monitoring and noise monitoring in coordination with outside agencies.
- Coordinating the environment related activities within the organization as well as with outside agencies.
- Reporting the status report to the statutory authorities.
- Systematically document and record keeping w.r.t. environmental issues.
- Plantation and their maintenance
- Collection statistics of health of workers and population of surrounding villages.
- Environmental compliance to the regulatory authorities.
- Communication with the concerned department on the environmental issue.
- Monitoring the progress of implementation of environmental management programme.

**10.2 AIR POLLUTION CONTROL MEASURES**

During the course of sand mining, no toxic substances are released into the atmosphere, so there seems to be no potential threat to health of human beings. In river bed mining activities, dust will be generated during mining, loading and transportation. The only source of fugitive gaseous emission during mining is vehicles which will be used for transportation. The environmental management for air pollution control includes:

- Plantation will be done along the road-sides and also the vacant land present under Gram Panchayat after consultation with local villagers/authority.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.

- The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads.
- Utmost care will be taken to prevent spillage of sand and stone from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of minerals.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.
- Plantation activities in consultation with village Panchayat along the roads will also reduce the impact of dust in the nearby villages.

## 10.3 WATER POLLUTION CONTROL MEASURES

During the operational phase of mine no waste water or industrial effluent will be generated. The environmental management for water pollution control includes:

- Water requirements for drinking, plantation and dust suppression will be met by tanker supply on the daily basis.
- Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed off into septic tank followed by soak pits.
- Mining in the area will be done up to depth of 0.5 m from the surface level well above the ground water table, therefore impact on water regime is not anticipated.
- Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

## 10.4 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to sand mining and other association activities a detailed noise survey has been carried out and results were cross referenced with standards and were found to be well within limits. Blasting technique is not used for sand mining hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand and by excavator involve trucks and tractor trolleys.

- Proper maintenance of all machines is being carried out, which help in reducing generation of noise during operations.
- No other equipments accept the Transportation vehicles and Excavator and Loaders (as and when required) for loading is allowed.
- Noise generated by these equipments is intermittent and does not cause much adverse impact.
- Periodical monitoring of noise will be done to adopt corrective actions wherever needed.
- Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

## 10.5 BIOLOGICAL ENVIRONMENT

Although, there are no significant adverse impacts from the project, the following measures are proposed to minimize anticipated impacts:

- It will be ensured that no mining activity will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
- As the mining site has no vegetation, no clearance of vegetation will be done.
- Prior to closure of mining operations / during the rainy season the eroded bank will be restored / reclaimed to minimize negative impacts on aquatic habitats.
- Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
- Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
- No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
- No night time mining will be allowed which may catch the attention of wild life.
- Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.
- ***Greenery development*:** The project will not lead to any tree cutting. However, as social responsibility, greenery will be developed along the both sides of road and the bank of river.

Community services will be deployed in raising these plantations. Trees of economic importance and native origin such as fruit trees shall be planted.

- Approx. 100 trees will be planted around haul road during the plan period.
- The trees proposed for plantation are:

## 10.6 LAND USE PLANNING

Degradation of land is not a very significant adverse impact of riverbed mining due to creation of access roads, mining operations, transportation of mined material. In order to prevent the environmental degradation of leased mine area and its surroundings, the following measures shall be taken;

- Mineral will be mined out after leaving sufficient safety zone from the bank as per sustainable sand mining guidelines-2016 for bank stability.
- No foreign material shall be allowed to remain/spill in river bed and catchment area, or no pits/pockets will be allowed to be filled with such material.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Pits will get replenished naturally every year after monsoon.

## 10.7 Occupational Health & Safety

Occupational safety and health is very closely related to productivity and good employer-employee relationship. The factor of occupational health is mainly dust. 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:

- Provision of rest shelters for mine workers with amenities like drinking water, portable toilets etc.
- All safety measures like use of safety appliances, such as dust masks, shoes, non breakable goggles as the case may be, shall be ensured. Safety awareness programs, awards, posters, slogans related to safety etc. will be encouraged.
- Training of employees for use of safety appliances and first aid in vocational training center.

- Regular maintenance and testing of all equipment as per manufacturers' guidelines.
- Periodical Medical Examination (PME) of all workers by a Medical Officer.
- First Aid facility will be 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.

## 10.8 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of the society. The overall impact of riverbed mining of sand on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site for transportation of mined material, etc. It will also give a good boost to the general economy of the area.

The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

## 10.9 ENVIRONMENT POLICY

Proponents of proposed Blocks in cluster of mines believes that responsible environmental stewardship comprises diligent application of well-established natural resource management, controls and practices for the protection of the mined out land, preservation of biodiversity and proper disposal of waste if any following the best environmental practices during the process of mining.

Environmental policy prescribed for standard operating process to bring into focus any violation/deviation of the environment and forest norms/conditions that the company operations will implement operational and risk management practices that provide for maximum protection of people and the environment. To this end, the owner resolves that company will follow the below mentioned practices:

Operate in accordance with prescribed industry standards while complying with all applicable environmental, health and safety laws and regulations.

- Establish and maintain a well-defined environmental, health and safety management system to guide its operations.

- Ensure that all employees, officers and directors understand and adhere to its environmental, health and safety management program.
- Provide operations with the necessary resources, expertise and training to effectively carry out its EHS management programs.
- Engage employees at all levels in programs directed towards minimizing adverse effects on the environment resulting from mining activity.
- Work proactively with governments and the public in the development of cost effective and realistic regulations that promote enhanced environmental, health and safety protection.
- Promote environmental awareness among its employees, their families and the communities in which it operates.
- Require those who provide services and products to practice good environmental stewardship.
- Mitigate its environmental impacts through efficient use of resources, and the reduction of input materials and waste.
- Maintain a high degree of emergency preparedness.

## 10.10 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Annual budget for EMC is very essential for successful implementation of EMP. Costs will be both Capital and Recurring cost as given below. The fund allocated will not be diverted for any other purposes and the top management will be responsible for this.

**Table 10.1, Budget of EMP**

| S. No | Proposed actions | EMP budget (in lacs) | |
|---|---|---|---|
| | | Capital | Recurring |
| 1 | Green belt development | 6.00 | 4.00 |
| 2 | Haulage route maintenance | 4.00 | 3.00 |
| 3 | Env. Awareness programme | 1.0 | 1.0 |
| 4 | Pollution monitoring | 2.00 | 2.00 |
| 5 | Dust suppression | 2.00 | 2.00 |

| | | | |
|---|---|---|---|
| 6 | Occupational Health & Safety of mine workers | 1.00 | 2.00 |
| 7 | Installation of Hume pipes | 6.00 | 5.00 |
| | **Total** | **22.0** | **19.0** |

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## 11.0 INTRODUCTION

### 11.1 Purpose of the Report

Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from SEIAA, Jammu & Kashmir under EIA notification of the MoEF&CC dated 14th September, 2006 and its subsequent amendment there-off and also the EIA Guidance Manual for Mining of Minerals (Feb, 2010) of MoEF&CC, Govt. of India, for seeking environmental clearance for mining of Sand in the applied mining lease area.

### 11.2 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

**Identification of Project**

The project is proposed to sand mining in an area of 9.62 hectares. The Mining sites are situated at Block No -06 at Village- Kunzar, Tehsil- Tangmarg District: Baramulla (Jammu & Kashmir).

**Identification of Project proponent**

Mr. Ritamber Singh

S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil

Ramgarh, District Samba, UT- Jammu and Kashmir

The above Block have an area of 9.62 ha, ToR was issued by JKEIAA vide letter no. JKEIAA/2021/587/4512-16 Dated 26.11.2021.

### 11.3 BRIEF DESCRIPTION OF PROJECT

The proposed project is open cast semi-mechanized mining/OTFM of sand (mineral mineral) with a proposed production of 1,92,400 MT per annum.

Plot Wise Area & Production Details are given below:

| S. no | Lessee | Area (ha) | Proposed Capacity (TPA) |
|---|---|---|---|
| 1 | **Block No. 06**<br>Mr. Ritamber Singh<br>S/O Sh. Prahlad Singh R/O Chak Shaman, Tehsil- Ramgarh, District Samba, UT- Jammu and Kashmir | 9.62 | 1,92,400 MTPA |

The mine lease co-ordinates and connectivity details are listed below:

**Table: 11.1 Mine lease Co-ordinates**

<table>
<tr><td>Coordinates</td><td>
<table>
<tr><th>Block No.</th><th>Points</th><th>Latitude(N)</th><th>Longitude(E)</th></tr>
<tr><td rowspan="7">Block No. 06</td><td>A</td><td>34°05’17.18”</td><td>74°30’40.14”</td></tr>
<tr><td>B</td><td>34°05’28.20”</td><td>74°30’50.82”</td></tr>
<tr><td>C</td><td>34°05’33.58”</td><td>74°30’58.91”</td></tr>
<tr><td>D</td><td>34°05’43.75”</td><td>74°31’06.64”</td></tr>
<tr><td>E</td><td>34°05’45.85”</td><td>74°31’04.31”</td></tr>
<tr><td>F</td><td>34°05’27.65”</td><td>74°30’46.84”</td></tr>
<tr><td>G</td><td>34°05’19.35”</td><td>74°31’37.84”</td></tr>
</table>
</td></tr>
<tr><td>Nearest Railway Station</td><td>Pattan Railway Station about 8.80 km NE from the lease area.</td></tr>
<tr><td>Nearest Airport</td><td>Sheikh Ul Alam International Airport Srinagar at a distance of about 25.00 km ESE from the lease area.</td></tr>
<tr><td>Nearest Highway</td><td>National Highway 1-A which is approx. 14.50km from the mine site in NE direction.</td></tr>
<tr><td>State, National boundaries.</td><td>No Interstate Boundary exists near the lease area.</td></tr>
</table>

The details of environmental setting are given in **Table-11.2**.

<table>
<tr><th>Sl. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1</td><td>Elevation</td><td>
<table>
<tr><th>S.N</th><th>Block No</th><th>Elevation</th></tr>
<tr><td>1</td><td>Block No. 06</td><td>1720 m to 1760 m</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>Ecological Sensitive Areas (National Park, Wildlife Sanctuaries)</td><td>None</td></tr>
</table>

| | | |
|---|---|---|
| 3 | Nearest water body | The mine site lies on the downstream river bed of Nallah Ferozpora District Baramulla. |
| 4 | Seismic Zone | Area is susceptible to Earthquake. Project area falls in Zone-IV High Damage Risk Zone. |

## 11.4 PROJECT DESCRIPTION

### 11.4.1 Mineral Reserves and production

The reserves have been each stretches & for individual blocks. Geological reserves and mineable reserves have been completed through cross sectional area method. The area of each section line is multiplied by strike influence to get the volume.

**Table-11.3:- Summary of Reserves Block No. 06**

| S. No | Category | Reserves |
|---|---|---|
| **1** | Total Geological Reserve | 4,42,520.0 MT |
| **2** | Proposed Production | 1,92,400 TPA |
| **3** | Ultimate depth of Mining | 1 m |

### 11.4.2 Conceptual Plan

The digging depth will be restricted to 1 m only. This will be further get replenished during the rainy season. The deposit in the river bed will never exhaust. The material will be regularly replenished during floods by the action of river water. The following steps will be taken care in mining:

- Pit limit at the end of lease period
- Sites of disposal of waste rock and top soil at the end of lease period
- No top soil or waste will be generated in the mining as such no disposal of waste is needed.

### 11.4.3 Method of Mining

Mining will be carried out by open cast semi mechanized method. It is proposed to produce 9,62,000 MT considering 270 working days with annual production of 1,92,400 MT/year of river bed material.

For this, following consideration taken for the proposed mine layout to be carried out systematically & scientifically:

1. Mining activity will be carried out by open cast Semi-mechanized method.
2. Lightweight excavators will be used for digging & loading of mineral in Tippers.
3. No OB/ waste material will be produced.
4. No drilling/ blasting are required as the material is loose in nature.
5. Roads will be properly made and sprayed by water for suppression of dust.
6. Roads in the lease area for the movement of loaded trippers/trucks.
7. Extraction activities will start in the block from the upstream end to downstream side. This will not obstruct the movement of water, if any, during monsoon period in the river course.

## 11.5 AFFORESTATION PROGRAMME

Topsoil if any would be utilized for intensive plantation and greenbelt development, all along the bank of the river. The details of plantation and number of saplings to be planted are given below.

## 11.6 LAND USE PATTERN

The mine lease area is hilly terrain region with river bed and river banks. There is no forest land or agriculture land in the mine lease area. The entire mining lease lies within River.

## 11.7 BASELINE ENVIRONMENTAL STATUS

### 11.7.1 Soil Quality

Three soil samples were collected in and around the mine lease area to assess the present soil quality of the region. The pH of the soil indicates that the soil is slightly alkaline in nature. Based on the results, it is evident that the soils are not contaminated by any polluting sources.

### 11.7.2 Meteorology

Meteorological data at the site was monitored during March 2021 to May 2021 representing post monsoon season. It was observed that the during study period, temperature ranged from 4 $^0$C to 24$^0$C.

### 11.7.3 Ambient Air Quality

The Ambient Air Quality Monitoring reveals that of monitoring stations with minimum Concentrations of PM10 were 31.20 µg/m$^3$ and maximum 59.03 µg/m$^3$ . The result of PM 2.5 reveals

that the minimum concentration of 16.72 µg/$m^3$ while maximum concentration of 38.21µg/$m^3$.

The gaseous pollutants SO2 and NOx were within the prescribed CPCB limit of 80 µg/$m^3$. For residential and rural areas at all stations. The minimum & maximum concentrations of SO2 were found to be 4.35 µg/$m^3$ & 10.11 µg/$m^3$ respectively. The minimum & maximum concentrations of NOx were found to be 10.17 µg/$m^3$ & 23.04µg/m3 respectively.

### 11.7.4 Water quality

To assess the physical and chemical properties of water in the region, water samples from three locations were collected from various water sources around the mine lease area.

- The pH limit fixed for drinking water samples as per IS-10500 Standards is 6.5 to 8.5 beyond this range the water will affect the mucus membrane or water supply system. During the study period, the pH was varying for ground waters from 7.27 to 7.74 and for surface water from 6.94 to 7.82. The pH values for all the samples collected in the study area during study period were found to be within the limits.
- The desirable limit for total dissolved solids as per IS-10500 Standards is 500 mg/l whereas the permissible limit in absence of alternate source is 2000mg/l. In ground water samples collected from the study area, the total dissolved solids are varying from 187.00 mg/l to 357.00 mg/l and in surface water, it is varing from 261.00 mg/l to 269 mg/l. The TDS of the samples were within the desirable limit & the permissible limit of 500mg/l & 2000 mg/l respectively.
- The values of DO, BOD & COD for all the samples collected in the study area during study period were found to be within the limits.

### 11.7.5 Noise Quality

Noise monitoring reveals that the minimum & maximum noise levels at day time were recorded as 41.72 dB (A) & 60.21 dB (A) respectively. The minimum & maximum noise levels at night time were found to be 34.71 dB (A) & 49.32 dB (A) respectively.

### 11.7.6 Ecological Environment

Based on the field studies and review of published literature, it is observed that there are. There are no wildlife sanctuaries and National Parks within the study area of 10-km radius.

## 11.8 ANTICIPATED ENVIRONMENTAL IMPACTS

### 11.8.1 Impact on Air Environment

The proposed mining activities loading and movement of other transport vehicles used in mining will generate dust (SPM/RSPM). Proper water sprinkling shall be carried out at the mine site. The mineral will be transported by road through covered tarpaulin trucks/tippers to reduce the fugitive emission caused by the wind.

### 11.8.2 Impact on Water Environment

Mining of sand from within or near river has an indirect impact on the physico-chemical habitat characteristics during monsoon season. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge.

The detrimental effects, if any, to biota resulting from bed material mining are caused by following:

- Alteration of flow patterns resulting from modification of the river
- An excess of suspended sediment during monsoon season.

Project activity will be carried out only in the dry part of the Nallah Ferozpora. Hence, none of the project activities affect the water environment directly. In the project, it is not proposed to divert or truncate any stream in monsoon season only. No proposal is envisaged for pumping of water either from the *River* (in monsoon) or tapping the ground water.

### 11.8.3 Impact on Water Quality

Analysis results of water samples collected from the buffer zone indicate that the pH, total dissolved solids (TDS) are well below the prescribed limits.

No wastewater generation is envisaged due to the mining operations. The sanitary wastewater will be sent to septic tanks.

### 11.8.4 Impact on Noise Environment

The proposed mining activity is semi-mechanized/OTFM in nature. No drilling & blasting is envisaged for the mining activity. Hence, the only impact is anticipated is due to movement of vehicles deployed for transportation of minerals. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.

### 11.8.5 Impact on Land Environment

The proposed extraction of stream bed materials, mining below the existing streambed, and alteration of channel-bed form and shape may lead to several impacts such as erosion of channel bed and banks, increase in channel slope, and change in channel morphology if, the operations are not carried out systematically.

The systematic and scientific removal of sand will not cause bed degradation. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere. The mining is planned in non monsoon seasons only, so that the excavated area gets replenished gradually during the monsoons each year.

### 11.8.6 Impact on flora and fauna

As the proposed mining will be carried out in a scientific manner, not much significant impact is anticipated. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species. The mining site has no vegetation; no clearance of vegetation will be done. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.

### 11.8.7 Impact on Socio - Economic Aspects

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within the lease area or in the vicinity. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated. The impact of mining activity in the area is positive on the socio-economic environment of the region. Sand mining will be providing employment to local people whenever there is requirement of manpower.

## 11.9 ENVIRONMENTAL MANAGEMENT PLAN

- Extraction will be done from the bed leaving safety zone from bank.
- The maximum working depth will remain above ground water table of the area.
- Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts.
- Ensuring wildlife protection & arranging awareness campaigns for the same.

- Minimize activities that release fine sediment to the river.
- Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals:
- Establishment of reclamation program with plantation of local/native & fast growing species
- Establishment of restoration plan during the closure of mine at the onset of monsoon season.
- Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters.
- Establishment of effective Monitoring Program monitored by Environment Management Cell.

## 11.10 ENVIRONMENTAL MONITORING PROGRAM

**Table 11.4: Post project environmental monitoring**

| 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) | Once a season for 4 seasons in 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 |

## 11.11 ADDITIONAL STUDIES

### 11.11.1 Risk Assessment

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding. The DGMS have been regularly issuing standing orders, model, standing orders and circulars to be followed by the mine management in case of disaster, if any.

### 11.11.2 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.

## 11.12 PROJECT BENEFITS

**Physical Benefits:** Road Transport, Market, Enhancement of green cover & Creation of community assets.

**Social Benefits:** Increase in Employment Potential, Contribution to the Exchequer, Increased Health related activities, Educational attainments & Strengthening of existing community facilities.

**Environmental Benefits:**

- Controlling river channel and protection of banks.
- Reducing submergence of adjoining agricultural lands due to flooding.
- Reducing aggradation of river level.
- A check on illegal mining activity.

**Corporate Social Responsibility**

2% of the total project cost will be allotted for the Corporate Environmental Responsibility as per OM dated 1st May 2018. The following has been proposed considering the needs & demand of the people. **Rs. 3.40 lakhs.**

CER budget detail has been given in chapter 8.

## 11.14 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;
- Monitoring program will be followed till the mining operations continue.
- 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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## CONSULTANTS ENGAGED

| | |
|---|---|
| Name of the Consultant | P and M Solution |
| Address | C-88, Sector 65, Noida -201301 – U.P |
| Credentials | Accredited by QCI/NABET |

Consultant accreditation details are given below:

**Quality Council of India**

National Accreditation Board for Education & Training

**CERTIFICATE OF ACCREDITATION**

**P and M Solution**

**First Floor, C-88, Sector-65, Noida, Uttar Pradesh- 201301**

**Accredited as Category -A** organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

| Sl. 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. | Metallurgical industries (ferrous & non-ferrous) | 8 | 3 (a) | B |
| 4. | Highways, | 34 | 7 (f) | A |
| 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 IA AC Minutes dated December 20, 2019 on QCI-NABET website.***

*The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/20/1223 dated February 3, 2020. The accreditation needs to be renewed before the expiry date by P and M Solution, Noida following due process of assessment.*

***Sr. Director, NABET***
**Dated: February 3, 2020**

***Certificate No.***
***NABET/EIA/1922/IA0053***

***Valid till***
***Dec 10, 2022***

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

| S No | Name | EC/FAE | DETAILS |
|---|---|---|---|
| 1 | Subhash Kumar | EC | EC |
| 2 | Pravin Kumar Sinha | FAE | GEO |
| 3 | Tapan Majumdar | FAE | HG |
| 4 | Subhash Kumar | FAE | SC |
| 5 | Manoj Kumar Pandey | FAE | EB |
| 6 | Vikas Chand Tripathi | FAE | RH,AP |
| 7 | Neha Singh | FAE | NV, AQ |
| 8 | Abhay Nath Mishra | FAE | SE |
| 9 | Hussain Ziauddin | FAE | WP |
| 10 | Poonam Kumari Mangalam | FAE | LU |

Consultant Contact Details:

P and M Solution

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