To **Date: 25.02.2022**

The Member Secretary
J&K Environment Impact Assessment Authority (JKEIAA)
Department of Ecology, Environment & Remote Sensing
Paryavaran Bhavan, Gladeni, Transport Nagar, Narwal,
District: Jammu (J&K U.T.) - 180006
Email: jkseiaa@gmail.com

Sub: River Bed Mining Project - Area 1.20 Ha of Mushtaq Ahmad Khanday located at Minor Mineral Block 17, Q - Kulgam Bridge Upstream Nallah Vishu, and District- Kulgam & U.T.: Jammu & Kashmir. **– Submission of Final EIA Report regarding.**

Respected Sir,

In regards to above, I am herewith submitting Final EIA Report along with necessary documents in the prescribed format of your esteemed Committee for your kind perusal and scrutiny.

Please be good enough to issue an Environmental Clearance at your earliest.

Thanking you,

Yours faithfully

Mushtaq Ahmad Khanday
S/o Sh. Lalud Din Khanday
District-Kulgam, J&K UT

FINAL
ENVIRONMENT IMPACT ASSESSSMENT
AND
ENVIRONMENT MANGEMENT PLAN
FOR
ENVIRONMENTAL CLEARANCE OF PROPOSED
RIVER BED MINING PROJECT

AT

MINOR MINERAL BLOCK NO – 17, Q - Kulgam Bridge
U/Stream Nallah Vishu
DISTRICT – Kulgam
UT: JAMMU & KASHMIR
(AREA – 1.20 Ha)
AVERAGE PROPOSED CAPACITY: 17,010 TPA with bulk density 2

PROJECT PROPONENT

Shri. Mushtaq Ahmad Khanday
S/o Sh. Lalud Din Khanday
District – Kulgam (UT),

Prepared By

ENVIRONMENT CONSULTANT

Globus Environment Engineering Services, Lucknow

326 – AB, 3rd Floor, Sahara Shopping Center, Lekhraj Crossing, Faizabad Road, Lucknow, Uttar Pradesh- 226016

Certification No. NABET/EIA/1821/IA0034.

To **Date: 25.02.2022**

The Member Secretary
J&K Environment Impact Assessment Authority (JKEIAA)
Department of Ecology, Environment & Remote Sensing
Paryavaran Bhavan, Gladeni, Transport Nagar, Narwal,
District: Jammu (J&K U.T.) - 180006
Email: jkseiaa@gmail.com

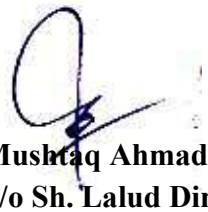
Sub River Bed Mining Project - Area 1.2 Ha of Mushtaq Ahmad Khanday located at Minor Mineral Block 17, Q - Kulgam Bridge Upstream Nallah Vishu, and District- Kulgam & U.T.: Jammu & Kashmir **Authorization Letter.**

Respected Sir,

In regards to above, I am authorizing to Globus Environment Engineering Services, Lucknow, 326 – AB, 3rd Floor, Sahara Shopping Center, Lekhraj Crossing, Faizabad Road, Lucknow, Uttar Pradesh-226016for my project for Environmental Clearance.

Thanking you,

Yours faithfully



Mushtaq Ahmad Khanday
S/o Sh. Lalud Din Khanday
District-Kulgam, J&K UT

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CHAPTER-I

INTRODUCTION

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1.0 PREAMBLE

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing. The present case comes under category 'B1' the purview of EIA Notification, MoEF, Govt. of India, New Delhi dated 14th September 2006 and its subsequent amendments thereof and EIA Guidance Manual for Mining (Feb, 2010) of MoEF, Govt. of India. This Draft EIA study has been carried out to assess the environmental, social and economic impacts of the project and formulate action plans to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options.

1.1 IDENTIFICATION OF PROJECT PROPONENT

Revised Letter of Intent has been allotted in favor of Mushtaq Ahmad Khanday (Project Proponent) by Government of Jammu and Kashmir Directorate of Geology and Mining, Srinagar for Minor Mineral Block No. 17 and Vide No. MSK/DGM/Sgr/F-03/Kul/B-17/257 Dated 10.03.2021 over an area of 1.20 Ha **(Copy of Revised LOI is enclosed as Annexure – I).**

Terms of Reference have been awarded in favor of Mushtaq Ahmad Khanday (Project Proponent) by J&K Environment Impact Assessment Authority, Jammu & Kashmir for Minor Mineral Block No. 17 and Vide Letter No. JKEIAA/2020/337/1834-38 Dated 26.07.2021 over an area of 1.20 Ha. **(Copy of TOR is enclosed as Annexure – II).**

Mining Plan has been allotted in favor of Mushtaq Ahmad Khanday (Project Proponent) by Department of Geology & Mining Govt. of Jammu & Kashmir for Mineral Block No.17 and Vide Letter No. 8/MDA/DGM/Kul/213 Dated 31.08.2020 over an area of 1.20 Ha. **(Copy of Mining Plan is enclosed as Annexure – III).**

1.2 BRIEF DESCRIPTION OF PROJECT

This is a project for mining by opencast manually method. The proposed average production is 17,010 TPA and the estimated project cost is 156.75 Lacs. The lessee is Maushtaq Ahmad Khanday for mining lease of Nallah Bed Mining over an area of 1.20 Ha at Village: Kulgam Tehsil: Kulgam, District: Kulgam, Jammu & Kashmir UT.

The life of the mine will be 5 years as per targeted production.

1.2.1 Project Nature, Size & Location

i. Nature

The proposed project is Nallah Bed Mining project. The method of mining is opencast Semi manually method.

ii. Size

The proposed capacity is 17,010 TPA and the estimated project cost is 156.75 Lacs. The lease area is 1.20 Ha.

iii. Location

The mining area is located in the Village: Kulgam, Tehsil: Kulgam, District: Kulgam, Jammu & Kashmir UT.

Table No. 1.1 Latitude & Longitude of Lease Area

S. No.	Pillar No.	Latitude	Longitude
1	D’	33°38'12.11"N	75°00'47.59"E
2	D	33°38'10.14"N	75°00'41.98"E
3	C	33°38'08.01"N	75°00'42.19"E
4	B’	33°38'08.88"N	75°00'47.77"E

Figure – 1.1 – Location map of proposed project site

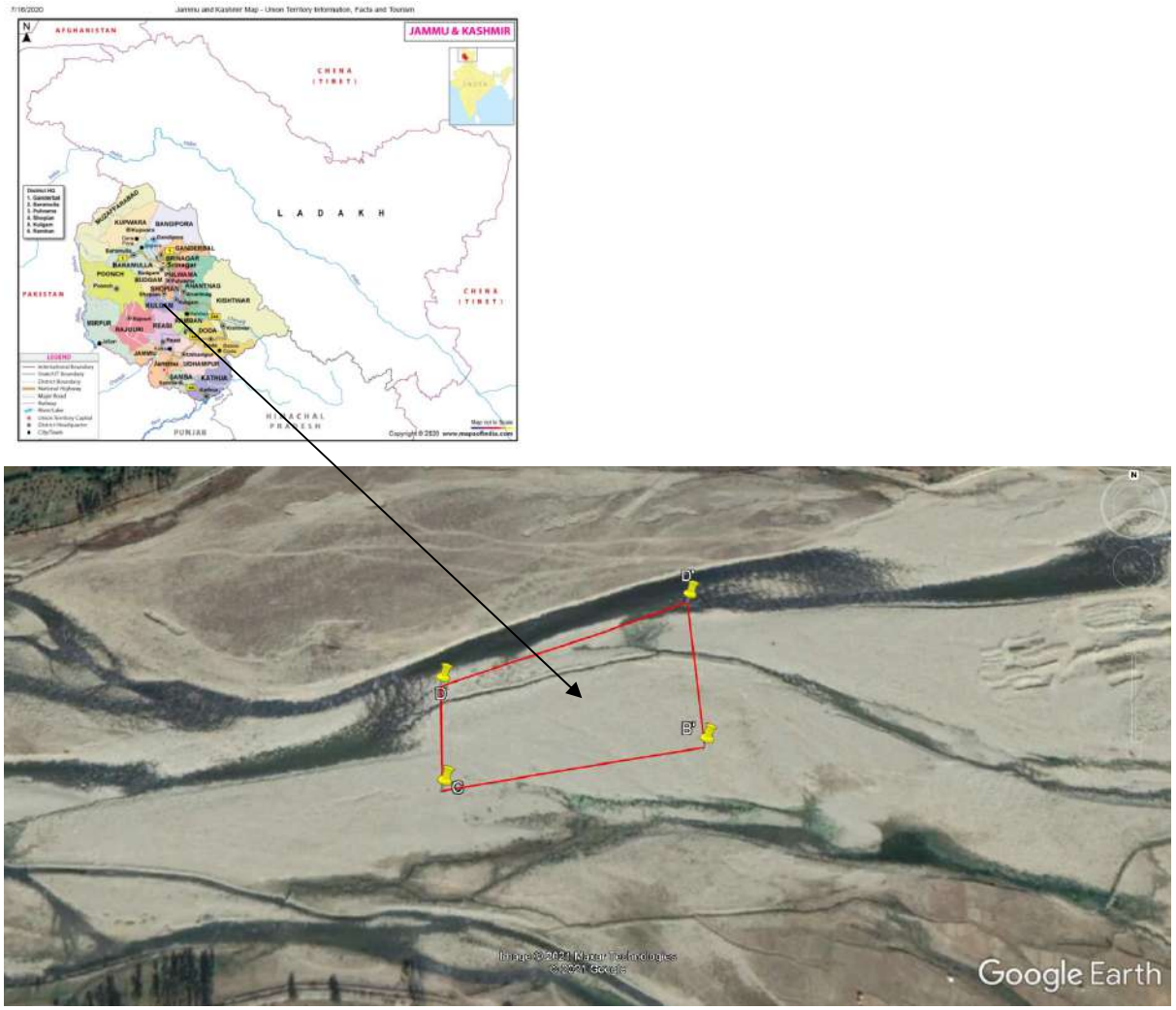

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Table No. 1.2 Salient Features of Project

Project Name	Nallah Bed Mining
Location of mine	Village : Kulgam Tehsil : Kulgam District : Kulgam State/U.T. : Jammu & Kashmir
Toposheet number	43 K/14
Minerals of mine	Sand, *Bajri* & Boulder
Total Mineable reserves	85,050 T
Life of mine	5 years
Proposed average production of mine	17,010 TPA
Ownership of land	Government land
Method of mining	Opencast Manually Method
No of working days	250 days
Water demand	Total water requirement is about 8.6 KLD = 1.8 KLD (Drinking & Domestic Uses) + 4.8 KLD (Plantation) + 2.0 KLD (Dust Suppression).
Sources of water	PHED Supply
Man power	40
Seismic zone	Zone V
Bidding Amount	54.80 lakhs
Project Cost	156.75 lakhs
EMP Cost	Capital Cost – 7.84 Lakhs Recurring Cost – 10 lakhs
PUC	77.76

Table 1.3: Environment Sensitivity

S. No	Particulates	Name of Places	Distance (Km)	Direction
1.	Nearest Airport	Seikh Ul Alam International Airport, Srinagar	42.91	NNW
2.	Nearest Railway Station	Sadura	22.15	ENE
3.	Nearest Bus Stand	Sumu Bus Stand, Shopian	7.12	NNW
		Boh Bus Stand, Boh	7.74	SE

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4.	Nearest State Highway/Any other road	Unmetalled Road	0.05	NNE
		Manzgam Nihama Road	0.32	SW
		Nehama Bridge	0.85	W
		Nihama Kulgam	0.30	NNW
		Metalled road to yaroo	0.39	S
5.	Nearest National Highway	No National Highway present in 10 km around project site		
6.	Nearest School/College	Govt High School, Nihama Kulgam	2.09	NE
		Government Higher Secondary School Manzgam	3.75	WSW
7.	Nearest Masjid	Masjid Shareif, Kulgam - Damhal Rd	2.10	E
		AllaiePora Masjid Bungam	2.55	ESE
		Jamia Masjid ahledees, Damhal Hanjipora	2.38	SE
		Masjid Shareif, Likhdi Pora	2.13	ENE
8.	Nearest Hospital	Sub District Hospital (Damhal Hanjipora Or D.h Pora)	2.54	SE
		Primary Health centre Hermain	9.19	NNE
9.	Nearest Police Station	Police Station D.H Pora	2.40	SE
10.	Nearest Fire Station	Fire Station Damhal hanji pora	3.03	SW
11.	National Border	No National Border present in 10 km around project site		
12.	International Border	No International Border present in 10 km around project site		
13.	Nearest Pond	No Pond present in 10 km around project site		
14.	Nearest River/Nallah/Canal	Project lies on Nallah Vishu		
15.	Wild Life Sanctuary	No Wild Life Sanctuary present in 10 km around project site		

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16.	Reserved Forest	No Reserved Forest present in 10 km around project site		
17.	Protected Forest	No Protected Forest present in 10 km around project site		
18.	Wetland	No Wetland present in 10 km around project site		
19.	Nearest Defence Installation	Army Camp Behibagh Kulgam	10.28	NNE
		Army Goodwill School Balpora	15.30	NNW
20.	Historical Importance Place	No Historical Importance Place present in 10 km around project site		
21.	Nearest Cremation Ground	No Cremation ground present in 10 km around project site		

Figure – 1.4 – Site Photographs

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Project's importance to the country and the region

The project involves collection of Sand, *Bajri* & Boulder, thus the proposed mining project would improve the supply of construction materials like Sand, *Bajri* & Boulder, making a positive impact on the infrastructural projects like construction of roads, buildings, bridges etc in the state.

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 by the way of royalty.

This project operation will generate employment to the people residing in vicinity for about 270 days annually and approximately 40 people will be benefited directly and indirectly by the project.

1.3 REGULATORY COMPLIANCES & APPLICABLE LAWS/REGULATIONS

a) There is no legal case against the project and project proponent.

b) There is no national park / Sanctuary notified under the Wildlife Protection Act in the study area.

1.4 SCOPE OF THE STUDY

In pursuance to the National Green Tribunal Order 4th/13th September, 2018 & subsequent office Memorandum dated 12th December, 2018 of Ministry of Environment, Forest & Climate Change, and Government of India. Committee agreed to formulate the EIA, EMP, CER, CSR be prepared along with joint public hearing for the three mining blocks. In view of above deliberations, the committee recommended General & Specific TOR for the project without prejudice to the standing court orders, if any, with respect to concerned mining project or final outcome of writ petitions/ PILs pending disposal before any court of law.

1.5 POST-ENVIRONMENTAL CLEARANCE MONITORING

For category B1 projects, it shall be mandatory for the project proponent to make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the district or state where the project is located and in addition, this shall also be displayed in the project proponent's website permanently. For category B1 projects, irrespective of its clearance by MOEF&CC/SEIAA, the project proponent shall prominently advertise in the newspapers indicating that the project has been accorded environmental clearance and the details of MoEF & CC website where it is displayed.

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The project management shall submit half-yearly compliance reports in respect of the stipulated prior environmental clearance terms and conditions on 1st June and 1st December of each calendar year. All such reports shall be public documents. The latest such compliance report shall be displayed on the web site of the concerned regulatory authority.

1.6 TRANSFERABILITY OF ENVIRONMENTAL CLEARANCE

A prior environmental clearance granted for a specific project or activity to an applicant may be transferred during its validity to another legal person entitled to undertake the project or activity on application by the transferor or the transferee with a written "no objection" by the transferor, to, and by the regulatory authority concerned, on the same terms and conditions under which the prior environmental clearance was initially granted, and for the same validity period.

1.7 GENERIC STRUCTURE OF ENVIRONMENTAL IMPACT ASSESSMENT DOCUMENT

In terms of the EIA notification of the MoEF dated 14th September 2006 and its subsequent amendment thereof, the generic structure of the EIA document should be as under:

1) Study of the Geological report, Pre-Feasibility report (PFR) or mining plan made available by the client.

2) Present Environmental Setting

3) Identification, prediction and evaluation of Anticipated Environmental Impact due to the Proposed mine and related facilities.

The environmental impacts would be anticipated in core and buffer zone on:

- Topography and drainage
- Climate
- Water quality (Surface/Ground)
- Hydro-geological Regime
- Air quality
- Noise Levels
- Soil Quality
- Flora and Fauna
- Land-Use
- Socio-Economic Conditions
- Habitat

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- Health, culture, human environment including public health, occupational health and safety
- Sensitive Places/Historical Monuments.
- Risk Hazard

This Final EIA Report is prepared in accordance with the Term of Reference issued by J&K Expert Appraisal Committee (JKEAC), Jammu & Kashmir as per the ToR letter of Minor Mineral Block No. 17 vide letter no. JKEIAA/2020/337/1834-38 dated 26.07.2021.

This Final EIA Report has been divided into twelve chapters (in addition to Executive Summary) as briefed here under:

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and Organization of the study and format of this report.

Chapter 2 – Project Description

This chapter provides information on project and capacity; need for the project; location; size or magnitude of operation; technology and process description; maps showing project layout, component of projects etc.

Chapter 3 – Description of the Environment

This chapter deals with the methodology and findings of field studies undertaken with respect to ambient air, meteorology, water, soils, noise levels, ecology to define the various existing environmental status in the area of the project. This also deals with the infrastructural development as a part of project and sources of pollution from the proposed mining project.

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

In this chapter, the potential impacts of the proposed mining and allied activities, which could cause significant environmental concerns, are identified and discussed. This discussion will form the basis for environmental management activities.

Chapter 5 – Analysis of Alternatives (Technology and Site)

This chapter will include a comparison of alternatives in this chapter to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost effective options, if any.

Chapter 6 – Environmental Monitoring Program

This chapter will include ascertaining the environmental impacts; state of pollution within the mine lease and in its vicinity; planning for predictive or corrective actions in respect of pollution to keep it within permissible limits.

Chapter 7 – Additional Studies

This chapter will include outcomes of public consultation, risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc.

Chapter 8 – Project Benefits

This chapter deals with improvements in the physical infrastructure, social infrastructure, employment potential and other tangible benefits due to proposed project activity.

Chapter 9 – Environmental Cost Benefit Analysis

This chapter includes environmental value enhancement (biodiversity, crop productivity, eco tourism etc.)

Chapter 10 – Environmental Management Plan

This chapter will include the description of administrative aspects of ensuring that the mitigation measures suggested are implemented and their effectiveness is monitored, after approval of the EIA.

Chapter 11 – Summary

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

This will includes the names of the consultants engaged in preparation of EIA and nature of consultancy rendered.

1.8 LAWS APPLICABLE TO THIS PROJECT

The Acts, Notifications, Rules and Amendments applicable for setting up a new mining industry or its expansion of an existing mine and for operation of a mine include the following:

- The Environment (Protection) Act and Rules, 1986;
- The Environmental Impact Assessment (EIA) Notification of MoEF&CC 14.09.2006 and its time to time amendment.
- Forest (Conservation) Act, 1980;
- The Air (Prevention and Control of Pollution) Act, Rules and Amendment, 1981, 1982, 1983,1987;
- The Factories Act and Amendment, 1948, 1987;

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- The Water (Prevention and Control of Pollution) Act and Rules, 1974, 1975;
- The Water (Prevention and Control of Pollution) Cess Act and Rules, 1977, 1978, 1991;
- The Public Liability Insurance Act, 1991;
- The Environment (Protection) Acts1986/Rules 1986
- The Environmental Standards Notification, 1993, 1996;
- The Environmental Audit Notification, 1992;
- The National Environment Tribunal Act, 1995.
- Mines and Mineral (Development and Regulation) Act, 1957.
- SRO 105 – 31st March, 2016.

1.9 PROFILE OF THE PROJECT PROPONENT

Sh. Mushtaq Ahmad Khanday

S/o Shri. Lalud Din Khanday

R/o Near masjid shareef Bhan,

District – Kulgam,

UT: - Jammu & Kashmir,

1.10 COMPLIANCE OF TOR CONDITION

(Vide Letter No. JKEIAA/2020/337/1834-38 Dated 26.07.2021)

Point Wise Compliance of ToR

Standard Terms of reference

S. No.	ToR	Compliance
1	Year-wise production details should be given, clearly stating the highest production.	A year-wise production detail is mentioned in Chapter 2, point 2.7.3 and page no. 14.
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	The Letter of Intent (LOI) has been approved by Government of Jammu and Kashmir Department of Geology and Mining, Srinagar for Minor Mineral Block No.- 17 and Vide No. MSK/DGM/Sgr/F-03/Kul/B-17/257 Dated 10.03.2021 as attached ***Annexure–I.***

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3	All documents including approved mine plans, 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, etc. and should be in the name of the lessee.	The EIA report is prepared on the basis of information given in the approved mine plan and supportive documents like lease deed etc. Production details are given in point 2.7.3 and page no. 14 of Chapter 2. No OB/ Waste material will be produced. All the material retrieved will be fully utilized. Public Hearing information has been incorporated in Final EIA Report. All the documents including approved mine plan, EIA report, lease deed is in the name of lessee.
4	All corner coordinates of the mine lease area, superimposed on 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).	Corner coordinates of the mine lease area showing the land use and other ecological features of the study area (core and buffer zone) appended in as an **Annexure V.**
5	Information should be provided on high resolution satellite image on with 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.	All information is incorporated in chapter - 2.
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	The details are incorporated in chapter – 2.

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	land use board or the concerned authority.	
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement / deviation / violation of the environmental or forest norms / conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large may also be detailed in the EIA Report	Yes, the details of Environment Policy laid down by the Company are attached as an ***Annexure VI.*** The Environment 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. The hierarchical flow diagram is attached as *Ref.* ***Annexure VI.*** Yes, the Company has a well laid out policy of reporting non compliances/ violations of Environmental Norms to Board of Directors/ owner of the Company.
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.	Issues relating to Mine safety have been detailed in Chapter 7 & Page No. 6/VII.
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.	The EIA study has been carried out in the 10 km radius zone from the periphery of ML area. All the data so generated have been incorporated in EIA/EMP report. No OB/ Waste material will be produced. All the material retrieved will be fully utilized.

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		A map showing study area (10 km radius) is given Chapter 3.
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 of the study area delineating forest area, agricultural land, grazing land, water bodies, human settlements, if any and other ecological features etc are shown by area breakup of the land use within 10 km radius from the mine site in Table 3.13 page 26/III of Chapter 3.
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	There are no overburden dumps outside the mine lease area. There will be no resettlement or rehabilitation involved in the project area, hence compensation details are not applicable.
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	No forest land is involved in this project so no certificate in this regard is required.

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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 this project so no clearance is required.
14	Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	No such policy is applicable as there is no settlement near to mine lease area.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	There is no RF/PF in the buffer zone of the lease area.
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.	There is no impact of mining project on wildlife of the area. There are no endangered species, wildlife sanctuary, wildlife corridors, faunal migratory routes or eco-sensitive area near the whole study area. However, care will be taken to protect wildlife in the study area.
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as	There are no National parks, and Biosphere Reserves, Wildlife Corridor, Tiger/ elephant reserve in the study area of 10 km radius surrounding the ML area.

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	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.	Flora or fauna species are found in the core zone. The species found in the study area are detailed under Section 3.11.4 Page 32/III of Chapter 3.
19	Proximity to Areas declared as 'Critically Polluted' should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the effect that the proposed mining activities could be considered.	The project does not come in the proximity to areas declared as 'Critically Polluted'.
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	There will be no resettlement or rehabilitation involved in the project area, hence compensation details are not applicable.

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	sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	
21	One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data 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	Primary baseline data on ambient air quality is given in Section 3.5 on Page 3/III of Chapter 3. Water quality is given in Section 3.7 Page 13/III of Chapter 3. Noise level is given in Section 3.6 Page 10/III of Chapter 3. Soil characteristics are given in Section 3.8 Page 22/III of Chapter 3. Details of flora and fauna are given in Section 3.11.4 Page 32/III of Chapter 3. Site-specific metrological data have been collected, as prescribed, for Summer Season of 1st January to 31st December 2021 in Chapter -3 & Page No 2/III.

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	PM10, particularly for free silica, should be given.	
22	Air quality modelling 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 modelling 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.	Details of Air Quality Modeling carried out for air quality of the area has been incorporated 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.	Total water requirement is about 8.6 KLD= 1.8 KLD (Drinking & Domestic Uses) + 4.8 KLD (Plantation) + 2.0 KLD (Dust Suppression).
24	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	As the lease area falls under semi critical zone as notified by CGWB, so no permission is required for drawl of water less than 100 KLD.
25	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	Backfilling of the pit will not be required since the material in the pit will get retored to it natural topography by the action of the river.
26	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures,	The detailed impact and control measure w.r.t the quality of water in the surrounding area is discussed under

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	if any required, should be provided.	Section 4.4.2 Page 5/IV of Chapter 4.
27	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report interalia 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.	Ground water level of the plateau area in general is 40-35 m bgl approx. The mining activity has been restricted up to a 3 m depth, so mining activity will not intersect the groundwater.
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.	Project falls on Nallah Vishu.
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 information is incorporated in Chapter- 11 & page No. 6/XI.
30	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise	A time bound Progressive greenbelt development plan is incorporated in chapter VIII, Table 8.1, 8.2 & 8.3 and page No. 4/VIII.

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	plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	
31	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Details of traffic are discussed in chapter 3.
32	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	Infrastructure facilities to be provided for the mine workers are as under:- i. Rest shelter/ rest room. ii. Separate facility for female and male workers. iii. First aid room. iv. Training center.

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		v. Canteen facilities.
33	Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.	There is no Reclamation and rehabilitation in the lease area as the project is river bed mining project.
34	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	The detail of occupational Health Impact has been given in chapter 4.
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 detail of Public Health implications has been given in chapter 4.
36	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Measures of socio-economic influence to the local community have been furnished and described in Chapter 3.
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,	Detailed Environmental Management Plan is discussed under Chapter 10 of EIA report.

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	occupational health impacts besides other impacts specific to the proposed Project	
38	Public Hearing points raised and commitment of the Project Proponent on the same along with 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 points will be incorporated at the time of Final EIA/EMP Report.
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.	There is no litigation pending against this project.
40	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Budget for Environmental protection is given in Table 10.1 page. 8/X of Chapter 10.
41	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Detailed Environmental Management Plan is discussed under Chapter 10 of EIA report.
42	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Discussed in Chapter – 3 and page No. 45/III.
43	Besides the above, the below mentioned general points are also to be followed: a) Executive Summary of the EIA/EMP Report b) All documents to be properly referenced with index and continuous page numbering. c) Where data are presented in the Report	All general points are incorporated in Final EIA Report.

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	especially in Tables, the period in which the data were collected and the sources should be indicated. d) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project. e) Where the documents provided are in a language other than English, an English translation should be provided. f) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. g) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J11013/41/2006-IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. h) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft	

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	EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. i) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable. j) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and physical measurements 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.	

Specific Terms of Reference:

1.	Impact of mining activity on adjacent agricultural lands with particular reference to run off, soil erosion and top-soil loss due to change in topography.	Discussed in Chapter 4.
2.	Details of Gradient of riverbed and 3-D view draped on the satellite image	Discussed in Chapter 3.
3.	Details of excavation schedule & sequential mining plan with a maximum mine depth of	Discussed in Chapter 2.

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	1 mtr.	
4.	Details of transportation of mined out materials with respect to axle load specified for the road as per the Indian Road congress for both the ways (loaded as well as unloaded trucks) load and its impact on the environment.	Discussed in Chapter 3.
5.	Impact on mining activity on the existing land use in the study area.	Discussed in Chapter 2.
6.	Impact on mining on aquatic life.	Discussed in Chapter 2.
7.	NOCs from competent authorities of Forest Department, Irrigation and Flood Control Dept. and Fisheries Dept. should be obtained and submitted while applying for EC	These NOCs from competent authorities of Forest Department, Irrigation and Flood Control Dept. and Fisheries Dept will be provided in Final EIA Report.
8.	The quantification of river bed material be based on excavation only up to a maximum depth of 1 m in the riverbed or 1 m above water table whichever comes first to safeguard ecological conditions.	Complied.
9.	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.	Discussed in Chapter 2.
10.	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.	Complied.
11.	The Photography and videography of the mining block shall be part of the Terms of Reference.	Complied.

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12.	The maps shall be submitted on a scale of 1: 3000 and 1: 1500 within 10 kms. Radius.	Incorporated in Chapter 2.
13.	The shortest extraction route leading to the main road but with minimum interference into human settlements should be the focus of operation. Detailed contour map of the approach road from river bed to district road / National highway should be furnished.	Complied.
14.	Dust suppression measures should be prescribed in the EIA/EMP.	Discussed in Chapter 4.
15.	Post project monitoring plan should be included in the study.	Discussed in Chapter 6
16.	Occupational health impacts should be assessed and plan for implementation of COVID-19 SOPs in the mining activity should be detailed.	Discussed in Chapter 4.
17.	The consultant while presenting field data in the EIA report should ensure that the site specific date-wise datasheets duly attested by the local panchayats head with his name, signatures and stamp and attested by District Mineral Officer with seal and signature are included in the EIA report.	Complied.
18.	The impact of mining activity on the neighboring villages need to be studied and extraction road need to be such that it has least crossing through villages settlements.	Complied.
19.	The data displayed on air quality monitoring stations should be captured with digital camera displaying the date on the photographs so captured and same should be submitted in support of the date-wise data	Complied.

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	sheets. These digital photographs should be submitted in soft as well as appended with the EIA report.	
20.	Mining shall be proposed manually minimally supported by semi-mechanized methods.	Complied.
21.	The mining plan be approved de novo by the competent authority, after it is technically reviewed by the Irrigation and Flood Control Department and should be based on the technical feasibility report of I&FC Dept.	Complied.
22.	The prescribed TORs would be valid for a period of four years for submission of the EIA/EMP reports, as per the S.O. No. 751(E) dated 17th of Feb., 2020.	Complied.
23.	Besides, the TORs are recommended without prejudice to the standing court orders, if any, w.r.t the concerned mining project or final outcome of writ petitions/LPAs pending disposal before any competent court of law w.r.t the concerned mining block.	Complied.

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CHAPTER-II

PROJECT DESCRIPTION

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2.0 GENERAL

This chapter gives broad description of the project, location, type of ore deposit(s), quality of reserves, Mining methodology, various site utilities and infrastructure etc. The downstream use of mineral for value addition and its importance is also described.

2.1 DESCIPTION OF PROJECT

The project Nallah Bed Mining Minor Mineral Block-17, Q – Kulgam Bridge Upstream, Vishu Nallah is proposed for the excavation of sand, *bajri* & boulder from the bed of Nallah Vishu. It is an opencast semi-mechanized mining project to excavate sand, *bajri* and boulder.

2.2 NEED FOR THE PROJECT

The project involves collection of Nallah bed material. This is very essential to prevent widening of the river bed due to the deposition of sediments which if not mined out will cause flooding, damage to the adjoining areas, destruction of life and property. This can only be prevented by maintaining the existing width and course of the river. If riverbed minerals are not mined, the widening of river bed will result in excessive erosion; causing further damage to flora-fauna, agricultural land and settlements situated in close proximity. In addition to this the production of minerals will benefit the State in the form of Royalty; the project will generate direct and indirect employment opportunities for the people in nearby villages. Also the mine management will initiate various socio-economic developments in nearby village from time to time to improve the socio- economic status in the area.

2.3 LOCATION DETAILS

The Nallah Bed Mining Minor Mineral Block-17, Q – Kulgam Bridge Upstream, Vishu Nallah Project is located in Village: Kulgam, Tehsil: Kulgam, District: Kulgam, and State/UT: Jammu & Kashmir. The lease area falls in Survey of India Toposheet 43 K/17. The lease co-ordinates and connectivity details are listed below:

S. No.	Pillar No.	Latitude	Longitude
1	D’	33°38'12.11"N	75°00'47.59"E
2	D	33°38'10.14"N	75°00'41.98"E
3	C	33°38'08.01"N	75°00'42.19"E
4	B’	33°38'08.88"N	75°00'47.77"E

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2.4 TOPOGRAPHY

The Applied Area is a Part of flood Plain of Vishu Nallah with almost flat topography. The Highest contour in the lease area is 1733mRL and the lowest contour is 1729mRL Vishu Nallah. The General slope of the area is toward north east.

(Source: Approved Mining Plan).

2.5 GEOLOGY

2.5.1 Regional Geology

District Kulgam forms the southern part of Kashmir basin wherein Proterozoic to Quaternary rocks of diverse origin area exposed. The main Geological Formations constituting the bed rocks and the surrounding mountains include the Salkhala, Panjal Volcanics and the Triassic Limestone covered by Quaternary Karewas and Alluvium deposits. A generalized regional stratigraphic sequence of the district is given below-

Group	Formation	Lithology	Age
	Quaternary	Unconsolidated clay, slit, sand and pebble	Holocene
Karewa	Naugam	Sand, clay, marl, conglomerate and losses sediments	Pliocene to Pleistocene
	Hirpur	Clay intercalated with silt, sand, conglomerate and lignite	
	Triassic Limestone	Limestone, shale, siliceous limestone, sandstone, quartzite	Triassic
Pir Panjal	Panjal Volcanic	Light and dark color amygdaloidal	Early Permian

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	Salkhala	Garnetiferous sericite phyllite, Quartz chlorite schist, Graphitic limestone	Proterozoic

Table 2.1: Regional Geological Succession of the area

2.5.2 Local Geology

The instant lease area falls in the fluvial bed of Nallah Vishu represented by the Quaternary sediments bounded by Upper Karewas. Upper Karewas mainly comprise yellow silt, grey clay, calcareous layers and sand with conglomerate in the lower part an continental loss and reworked loss in the upper part. This Formation is disposed horizontally and is reported devoid of fossils or presence of lignite. Nallah Vishu along with its tributaries area involved in weathering of catchment lithologies and finally transport and deposit its sediment load in the form of boulder, *Bajri*, and sand at convenient locations like meanders, etc. the deposits represent recent geological Formation and contain several meter thickness of sediments of basalt, limestone, quartize with fine nature of sand, silt and clay. The present deposits are of good quality and can be used for building industries.

Kulgam District has vast stretches of a largely flat landform created by the deposition of sediments over a long period of time by nalla vishu originating from Pir Panjal Range. These alluvial plains are gently sloping surfaces formed of sediments of very fertile nature and mostly lie along the course of the nalla Vishu. These plains are particularly put to the paddy cultivation producing large varieties of rice in bulk quantities. These plains have an average elevation of 1600 m above mean sea level and are often flooded by the nalla vishu. Alluvium is typically made up of a variety of materials, including fine particles of slit, clay, sand and larger particles of cobbles, pebble and gravels that are loosely held with clayey and silty matrix. The material becomes finer in the area when it merges in the upstream plains.

(Source: CGWA.gov.in & Approved Mining Plan).

2.5.3 CLIMATE

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Kulgam Weather Forecast. Providing a local hourly kulgam weather forecast of rain, sun, wind, humidity and temperature. The Long-range 12 day forecast also includes detail for Kulgam weather today. Live weather reports from Kulgam weather stations and weather warnings that include risk of thunder, high UV index and forecast gales. Kulgam is 1,739 m above sea level and located at 33.65° N 75.02° E. Kulgam has a population of 16,246.

During winter period rainfall also occurs in lower hills and valleys parts.

Mean Maximum Temperature : 21^0C

Mean Minimum Temperature : 7^0C

Average Annual Rainfall : 3 mm

(Source: https://www.weather-forecast.com/locations/kulgam/forecasts/latest)

2.5.4 SURFACE DRAINAGE PATTERN

The present mining project represents sub surface minor mineral exploitation in the form of replenishable fluvial deposits of Nallah Vishu without the involvement of any drilling, blasting and use of chemical. Further, water shall be drained along river flow. As such area does not require any specific mine drainage pattern.

(Source: Approved Mining Plan).

2.6 RESERVE

To estimate the reserve of river bed material, the following parameters are considered:

- The reserves are calculated on the basis of established width, thickness and strike length/influence of the mineralized formation in the area.
- A barrier of 7.5 m width has been left from the lease boundary as a statutory area.
- The mining reserves are calculated up to the depth of 1.0 m from the existing river bed. There is no overburden and all reserves are proved reserves.
- The Nallah bed deposit comprises of boulder, *bajri* and sand and as such the average bulk density is assumes as 2.0 for calculation of the tonnage.

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Geological Reserve

Sectional Line	Sectional area (l x b = m^2)	Depth (m)	Volume (m^3)	Specific gravity	Reserves (MT)	Reserve Calculated as per Replenishment study of 5 years
A-B	12,000	1	12,000	2.0	24,000	1,20,000

Mineable Reserve

Sectional Line	Sectional area (l x b = m^2)	Depth (m)	Volume (m^3)	Specific gravity	Reserves (MT)	Reserve Calculated as per Replenishment study of 5 years
A-B	8,505	1	8,505	2.0	17,010	85,050

2.7 MINING

2.7.1 Methodology of Mining

The proposed Nallah Bed Mining Minor Mineral Block-17, Q – Kulgam Bridge Upstream, Vishu Nallah Project, will be carried out by open cast manually method. The Nallah bed material (NBM) excavated will be removed by light weight excavators and directly loaded in tippers from the place of excavation to the mineral processing units or construction sites. Following geo-scientific methods are proposed to carry out during the mining operations.

1. Mining will be restricted to the lease area to a maximum depth of 1.0 m from the surface as per the provision of Jammu & Kashmir Minor Mineral Concession, Storage, Transportation of Minerals and Prevention of Illegal Mining Rules, 2016.
2. A barrier of 7.5m width has been left from the lease boundary as a statutory area and further pit slope shall be maintained below 45°.
3. Proper benching of 1.0 m height will be maintained in the Nallah bed parallel to the banks of the Nallah. Mining shall be carried out in a single bench of 1.0 m height divided into 5 sub blocks, one sub- block to be excavated each year, extracted block as such left for subsequent replenishment.

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4. The natural gradient of the Nallah bed will be maintained during the course of mining. Mining activities will be carried out in such a fashion so that there is no obstruction to the movement of water flow.
5. The mining shall be done during daytime only to avoid any environmental pollution and accidental hazards. Working will be carried out for 270 working days in a calendar year.
6. The Mining of NBM will not generate any topsoil or waste, therefore no space will be needed for soil stacking yard or waste dumps.
7. 40 employments will be required/engaged for the proposed project.
8. System of working in the lease will be as per the provisions of mines Act 1952 and Metalliferous Mines regulations: 1961.
9. Haul roads will be properly maintained and sprayed by water for suppression of dust.
10. Personal protection equipments life safety helmet, safety shoes, safety goggles, dust respirators etc. will be provided to the labors as per the mining regulations.
11. The maximum extraction of the mineral is planned in the lean discharge period of the water body.
12. The Nallah bed material so excavated shall be transported by trucks through approach roads which finally merge with tar roads for final destinations.
13. Safety zones with respect to bridge, hydraulic points and or/embankment as prescribed by the Department of Geology and Mining should be strictly adhered to,
14. Mining operations in the river mine block will be in accordance with all other provisions applicable as per Mines Act, 1952, Metalliferous Mines Regulations; 1961, Mines and Minerals (Development and Regulation) Act, 1957, Sustainable Sand Mining Management Guidelines 2016, Jammu & Kashmir Minor Mineral Concession, Storage. Transportation of Minerals and Prevention of Illegal Mining Rules, 2016, Jammu and Kashmir Water Resources (Regulation and Management) Act, 2010 Forest (Conservation) Act, 1980 and Environment (Protection) Act, 1986, Wild Life (Protection) Act, 1972, Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 and any other applicable law.

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2.7.2 Restriction of mining:

1. No mining operation shall be carried out within 50 m of railway line, reservoir or road horizontally from the outer toe of the bank or the outer age of the cutting as the case may be.
2. The mining will not be allowed below the water table.
3. No mining operation will be allowed in forest area.
4. No mining will be done during monsoon season and during night times.
5. Sand, *Bajri,* Boulder shall not be extracted up to a distance of 1 kilometer (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.
6. Mining depth should be restricted to 1 meters and distance from the bank should be ¼th or river width and should not be less than 7.5 meters.
7. A buffer distance /un-mined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.
8. Nallah bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from Nallah banks but up to 10% of the width of the river, as the case may be and decided by regulatory authority while granting environmental clearance in consultation with irrigation department. Regulating authority while regulating the zone of river bed mining shall ensure that the objective to minimize the effects of riverbank erosion and consequential channel migration are achieved to the extent possible. In general, the area for removal of minerals shall not exceed 60% of the mine lease area, and any deviation or relaxation in this regard shall be adequately supported by the scientific report.
9. The reclamation of mined out areas will be natural, as during the next monsoon the void will be replenished with sand, which will be available for fresh quarrying for the next dry season.
10. The contractor will abide by provision of Mines Act, 1952, Interstate Migrant Work Man Act the contractor with the satisfaction of competent authority will

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provide drinking water, rest shelter, first aid box, welfare facilities as Central and State Govt. labor laws.

11. The contractors will abide at the time of mining with the term and condition as laid down under Mines Act, 1952 and Mines & Minerals (Regulation and Development) Act, 1957, SRO 105-31st March, 2016, Forest (Conservation) Act, 1980 and the stipulations of the EIA/EMP.

2.7.3 Details of Production

Year	ROM(Assuming Specific Gravity as 2.0)
I Year	17,010
II Year	17,010
III Year	17,010
IV Year	17,010
V Year	17,010
Total	**85,050**

Total production of mineral block no.17 is 85,050 T for 5 years, which will be excavated by opencast semi-mechanized method for 17,010 TPA.

Block Number	Area	Location	Mineable Reserve	Average production Capacity
17	1.20 Ha	River Bed Mining Minor Mineral Block-17, Q – Kulgam Bridge Upstream, Vishu Nallah, Village – Kulgam, Tehsil- Kulgam, District- Kulgam, and State/U.T.- J & K	85,050 T	17,010 TPA

2.8 BLASTING

There will be no drilling and blasting as the material is losse in nature which shall be in the interest of environment and ecology.

2.9 MINE MACHNINERY & FUEL CONSUMPTION

The proposed Nallah bed mining project shall be carried out by opencast manually method wherein the river bed material shall be exploited utilizing light weight excavators and loaded in tippers from the place of excavation to the minor mineral processing units or construction sites.

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2.10 STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTES

Mining of Nallah Bed is fresh material and will not generate any waste, thus disposal of waste and its arrangements will not be required.

2.11 USE OF MINERAL

The Nallah bed mineral (boulder, *bajri* & sand) are of good quality and will be used in the construction industries and making highways.

2.12 SITE SERVICES

2.12.1 Working Office:

Temporary working office will be based at mine site. This will be a temporary structure and can easily be shifted one side to another side as & when required,

2.12.2 Rest Shelter:

A temporary structure with toilet facility as a rest shelter to labors will be provided to the workers near mine site.

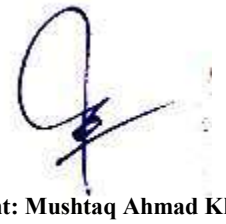
2.12.3 Primary Health/First Aid:

First aid box with principal medicine will be kept at mine site to facilitate the first aid treatment to the workers in case of any eventuality.

2.12.4 Water arrangement:

Separate arrangements for drinking water for the labors will also be made in the working office and rest shelter.

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:



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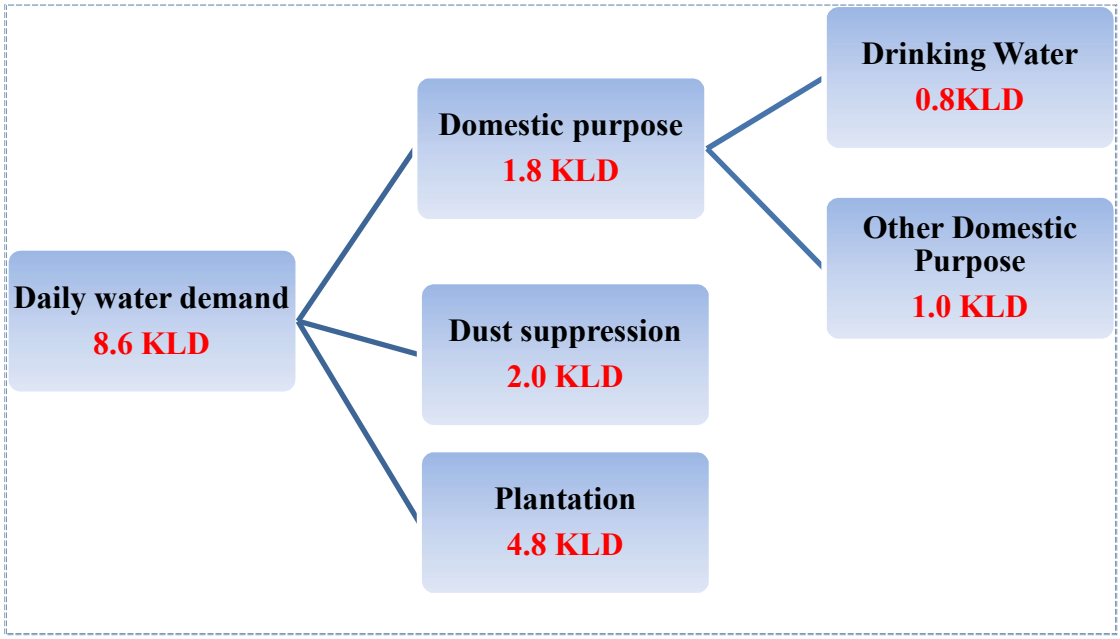

The water will be supplied from available sources from PHED supply.

2.12.5 Sanitary facilities:

Temporary latrines & urinals shall be maintained at convenient places for use of labors.

2.12.6 Man Power Requirement:

The manpower requirement for the proposed project is given below along with the breakup, who will be utilized for excavation & loading of minerals into trucks or tractor-trolleys.

S. No.	Category	Numbers
1.	Mine Manager (part time)	2
2.	Supervisor	2
3.	Manager (accounts)	4
4.	Operator	9
5.	Driver	24
6.	Helper	9
TOTAL		**50**

*Additional workers include workers for dust suppression purpose, providing water for drinking & domestic purpose, for maintenance of roads, etc.

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CHAPTER- 3

DESCRIPTION OF ENVIRONMENT

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3.0 DESCRIPTION OF THE ENVIRONMENT

3.1 Preamble

Baseline environmental status in and around proposed mining lease area depicts the existing environmental 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 by Ultra Testing & Research laboratory recognized by MoEF&CC as per EPA Act, 1986.

The main aim of the impact assessment study depends mainly on two factors. One is the estimation of impact from proposed project on the environment and second one is the assessment of the environmental condition. Both are key factors to arrive at the post project scenario. The estimated impact due to the proposal mine lease area can be superimposed over the existing conditions to arrive at the post project scenario. The scope of the baseline studies includes detailed characterization of following environmental components, which are most likely to be influenced by the setting up of a mine lease area.

- ✓ Metrological conditions
- ✓ Ambient Air Quality
- ✓ Noise levels
- ✓ Water Quality (Surface + Ground water)
- ✓ Soil Quality
- ✓ Socio economic status

3.2 Study Area

The proposed project as a center, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring.

3.3 Study Period

The baseline environment quality was carried out over a radial distance of 10 km around the mine during post monsoon season covering the months of **1st October 2020 to 1st December 2020.**

3.4 Meteorological Conditions

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

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processes associated with them.

A meteorological station was set up at the proposed plant premises. Meteorological data was generated during the post-monsoon season monitoring period.

The following parameters were recorded at hourly intervals continuously during monitoring period:

- ✓ Wind speed
- ✓ Wind Direction
- ✓ Temperature

Rainfall was recorded on daily basis.

Table-3.1: Summarized Meteorological Data for the Monitoring Period

(Jan 2020 –Dec 2020) To be taken

(Jan2020– Dec2020)

Parameters	Jan	Feb	Mar.	April	May	June	July	Aug	Sep.	Oct.	Nov.	Dec.	Annual
Max. Temp.	46	65	68	78	86	90	92	96	90	80	69	57	76.42
Min. Temp.	34	0	37	40	47	55	59	0	50	35	0	39	33.00
R.H. %	80.23	68.47	68.95	65.83	61.27	60.22	56.08	64.43	64.48	62.02	73.29	75.99	66.77
W. Speed in Km/hr.	0.79	1.16	1.41	1.33	1.80	1.57	1.39	1.43	1.10	0.68	0.70	1.16	1.21
Rainfall in mm.	0.17	0.01	0.13	0.085	0.05	0.06	0.004	0.17	0.03	0.00	0.03	0.06	0.07

Source: - https://www.wunderground.com/history/monthly/in/budgam/VISR/date/2020-12

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3.5 AIR ENVIRONMENT

3.5.1 Ambient Air Quality

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

Methodology adopted for the study

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
- ✓ 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 18 locations with due consideration to the above mentioned points. AAQM locations were selected in downwind and upwind direction of the proposed mining lease area covering core and buffer zones. The details of the monitoring stations are given in **Figure 3.2.**

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours for 12 weeks during the study period. The common air pollutant namely, Particulate Matter-10 (PM_{10}), Sulphur-dioxide (SO_2), Oxides of Nitrogen (NO_2) has been measured through a planned field monitoring.

Statistical parameters like minimum, maximum, average and 98th 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 rural and other area.

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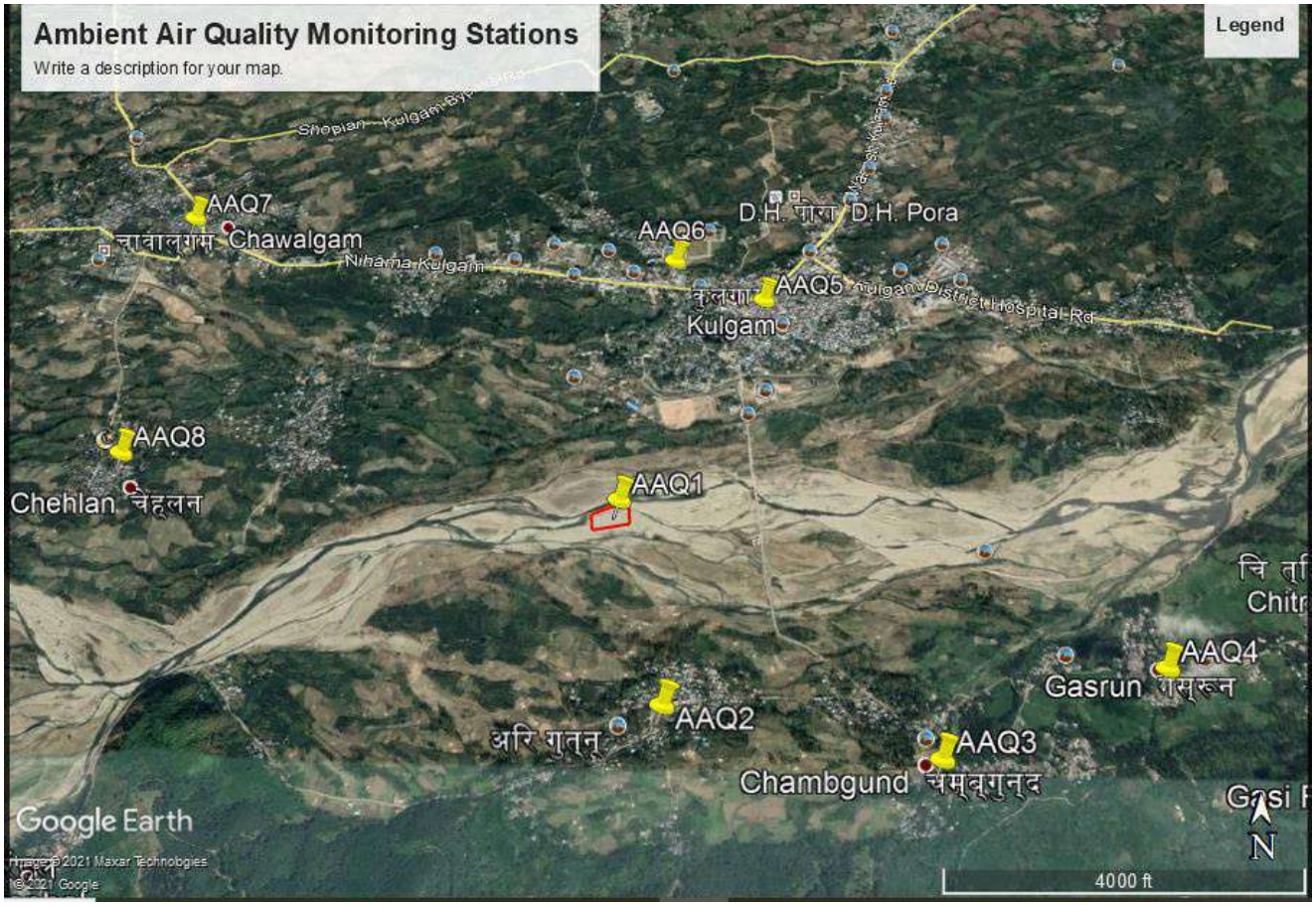

Figure 3.2 Showing Ambient Air Monitoring Locations marked within the Study Area

Table-3.2: Location of Ambient Air Quality Monitoring Stations

Locations Code	Locations	Direction	Distance (km)	Latitude	Longitude
AAQ 1	Minor Mineral Block No- 17	----	----	33°38'8.01"N	75°0'42.19"E
AAQ 2	District Kulgam Hospital	N	1.04	33°38'43.62"N	75° 1'39.19"E
AAQ 3	Government High School, Bonpora	SE	0.7	33°38'11.26"N	75° 2'55.65"E
AAQ 4	Government Higher Secondary School, Chambgund	ESE	1.47	33°39'3.33"N	75° 4'37.52"E
AAQ 5	Akhal	SW	1.31	33°38'42.94"N	75° 3'2.25"E
AAQ 6	Dard Gund	WNW	1.57	33°40'5.05"N	75° 3'3.36"E
AAQ 7	Chawalgam	WNW	0.49	33°39'28.97"N	75° 3'21.71"E
AAQ 8	Chehlan	SSW	0.95	33°39'39.47"N	75° 4'31.50"E

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Table-3.3 (a) Ambient Air Quality in the Study Area PM_{10}.

Location		PM_{10} (µg/m^3)			
Code	Name of the Station	Min	Max	Average	98th percentile
AAQ 1	Minor Mineral Block No- 17	66.9	**86.8**	75.0	**86.6**
AAQ 2	District Kulgam Hospital	55.3	70.8	61.7	**69.8**
AAQ 3	Government High School, Bonpora	**52.8**	75.1	61.5	74.1
AAQ 4	Government Higher Secondary School, Chambgund	58.8	73.8	64.9	72.6
AAQ 5	Akhal	55.4	75.3	62.8	75.1
AAQ 6	Dard Gund	56.2	71.2	63.1	71.1
AAQ 7	Chawalgam	56.7	76.6	64.8	76.4
AAQ 8	Chehlan	58.6	74.1	65.0	73.1

Table-3.3 (b) Ambient Air Quality in the Study Area$PM_{2.5}$

Location		$PM_{2.5}$(µg/m^3)			
Code	Name of the Station	Min	Max	Average	98th percentile
AAQ 1	Minor Mineral Block No- 17	32.5	**45.7**	37.4	**44.5**
AAQ 2	District Kulgam Hospital	26.7	36.3	30.9	**36.2**
AAQ 3	Government High School, Bonpora	**26.1**	39.8	31.1	39.2
AAQ 4	Government Higher Secondary School, Chambgund	27.6	38.0	32.4	37.8
AAQ 5	Akhal	27.3	39.3	31.4	38.1
AAQ 6	Dard Gund	27.1	37.2	31.9	37.1
AAQ 7	Chawalgam	27.9	40.3	32.3	39.1
AAQ 8	Chehlan	28.2	38.2	32.6	38.0

Table-3.3 (c) Ambient Air Quality in the Study Area SO_2

Location		SO_2 (µg/m^3)			
Code	Name of the Station	Min	Max	Average	98th percentile
AAQ 1	Minor Mineral Block No- 17	5.8	**7.7**	6.6	**7.7**
AAQ 2	District Kulgam Hospital	**4.6**	6.3	5.5	**6.2**
AAQ 3	Government High School, Bonpora	4.7	6.7	5.4	6.6
AAQ 4	Government Higher Secondary School, Chambgund	4.9	6.6	5.7	6.5

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AAQ 5	Akhal	4.9	6.7	5.6	6.7
AAQ 6	Dard Gund	4.7	6.4	5.6	6.3
AAQ 7	Chawalgam	5.0	6.8	5.7	6.8
AAQ 8	Chehlan	4.9	6.6	5.7	6.5

Table-3.3 (d) Ambient Air Quality in the Study Area NO_x

Location		**NOx (µg/m^3)**			
Code	**Name of the Station**	**Min**	**Max**	**Average**	**98th percentile**
AAQ 1	Minor Mineral Block No- 17	7.8	**13.0**	10.6	**12.7**
AAQ 2	District Kulgam Hospital	7.0	10.2	8.6	**10.1**
AAQ 3	Government High School, Bonpora	**6.2**	11.7	8.7	11.4
AAQ 4	Government Higher Secondary School, Chambgund	7.4	10.6	9.1	10.5
AAQ 5	Akhal	6.5	11.2	8.8	11.0
AAQ 6	Dard Gund	7.1	10.9	8.9	10.7
AAQ 7	Chawalgam	6.6	11.4	9.1	11.1
AAQ 8	Chehlan	7.4	10.7	9.1	10.6

Table-3.3 (e) Ambient Air Quality in the Study Area (CO)

Location		**CO (mg/m^3)**			
Code	**Name of the Station**	**Min**	**Max**	**Average**	**98th percentile**
AAQ 1	Minor Mineral Block No- 17	0.22	**0.67**	0.44	**0.63**
AAQ 2	District Kulgam Hospital	0.17	0.54	0.38	**0.54**
AAQ 3	Government High School, Bonpora	**0.17**	0.57	0.38	0.56
AAQ 4	Government Higher Secondary School, Chambgund	0.18	0.57	0.38	0.56
AAQ 5	Akhal	0.18	0.57	0.38	0.55
AAQ 6	Dard Gund	0.17	0.55	0.39	0.55
AAQ 7	Chawalgam	0.19	0.58	0.38	0.55
AAQ 8	Chehlan	0.18	0.57	0.40	0.57

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3.5.3: Baseline Scenario

a) Suspended Particulate Matter(PM_{10})

Suspended particulate matter in general terms is the particulate matter in suspension in ambient air. It includes dust, smoke etc. In general some of the important sources of suspended particulate matter are mines. The following sources of suspended particulate matter in the study area are identified:

- ✓ Emission due to vehicular movement
- ✓ Dust generation from ground or other mining operations

The minimum and maximum level of PM_{10} recorded within the study area was in the range of 52.8 $\mu g/m^3$ to 86.8 $\mu g/m^3$ with the 98th percentile ranging between 69.8 $\mu g/m^3$ to 86.6 $\mu g/m^3$. The 24 hourly average values of PM_{10} were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 100 $\mu g/m^3$ for PM_{10} in industrial, residential, rural and other area.

b) Particulate Matter ($PM_{2.5}$)

Fine particles include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. In general, some of the important sources of particulate matter are mines. The following sources of particulate matter in the study area are identified:

- ✓ Emission due to vehicular movement
- ✓ Dust generation from ground or other mining operations

$PM_{2.5}$ recorded within the study area was in the range of 26.1 $\mu g/m^3$ to 45.7 $\mu g/m^3$ with the 98th percentile ranging between 36.2 $\mu g/m^3$ to 44.5 $\mu g/m^3$were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 60$\mu g/m^3$ for $PM_{2.5}$ for industrial, residential, rural and other areas.

c) Sulphur Dioxide (SO_2)

Sulphur dioxide gas is an inorganic gaseous pollutant. Sulphur dioxide emissions are expected to be emitted wherever combustion of any fuel containing Sulphur takes place. The Sulphur in the fuel will combine with oxygen to form Sulphur dioxide. The following sources of Sulphur dioxide in the study area are identified:

- ✓ Emissions from domestic/consumption of fuel (coal, diesel, etc.)

Sulphur dioxide in atmosphere is significant because of its toxicity; Sulphur dioxide is capable of producing illness and lung injury. Further it can combine with water in the air to form toxic

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acid aerosols that can corrode metal surfaces, fabrics and the leaves of plants. Sulphur dioxide is an irritant to the eyes and respiratory system. Excessive exposure to Sulphur dioxide causes bronchial asthma and other breathing related diseases as it affects the lungs.

The minimum and maximum level of SO_2 recorded within the study area was in the range of 4.6 to 7.7 µg/m^3 with the 98th percentile ranging between 6.2 µg/m^3 to 7.7 µg/m^3.

The 24 hourly average values of SO_2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m^3 for industrial, residential, rural and other area.

d) Oxides of Nitrogen (NO_2)

The important sources of oxides of Nitrogen are from utilities and auto exhaust due to vehicular movement in mine lease area. The following sources of oxides of nitrogen in the study area are identified.

- ✓ Emissions from vehicular movements in the study area.

Oxides of Nitrogen in the presence of sunlight will undergo reactions with a number of organic compounds to produce all the effects associated with photochemical smog. NO_x has inherent ability to produce deleterious effects by themselves like toxicity. It causes asphyxiation when its concentration is great enough to reduce the normal oxygen supply from the air.

The minimum and maximum level of NO_x recorded within the study area was in the range of 6.2 µg/m^3 to 13.0 µg/m^3 with the 98th percentile ranging between 10.1 µg/m^3 to 12.7 µg/m^3. The 24 hourly average values of NO_2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m^3 for industrial, residential, rural and other area.

3.6 NOISE LEVELS

Noise is one of the most undesirable and unwanted by-products of our modern life style. It may not seem as insidious or harmful as air and water pollutants but it affects human health and well-being and can contribute to deterioration of human well-being in general and can cause neurological disturbances and physiological damage to the hearing mechanism in particular. It is therefore, necessary to measure both the quality as well as the quantity of noise in and around the proposed site.

3.6.1 Source of Noise

The main sources of noise in the study area are domestic activities, industrial activities and vehicular traffic. The main occupation of the villagers in the study area is agriculture and

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business.

3.6.2 Noise level in the Study Area

The baseline noise levels have been monitored at 8 locations within the study zone, using a sound level meter and noise level measurement locations were identified for assessment of existing noise level status, keeping in view the land use pattern, industrial area, Silence Zone, residential areas in villages etc., if available within 10 km radius of the study area. The day levels have been monitored during 6.00 AM to 10.00 PM and night noise levels, during 10.00 PM to 6.00 AM. The noise monitoring stations are shown in Figure 3.3 and represented in Table 3.4. The results are presented in Table 3.6.

Table 3.4: Noise Level Monitoring Stations in the Study Area

Code	Locations	Zone	Direction	Distance	Latitude	Longitude
NQ1	Minor Mineral Block No- 17	Industrial	----	----	33°38'10.00"N	75° 1'47.81"E
NQ2	Brazlo	Residential	NE	0.33	33°38'42.94"N	75° 3'2.25"E
NQ3	Govt Polytechnic college Kulgam	Silent	NE	0.52	33°38'27.50"N	75° 1'8.90"E
NQ4	Chitripora	Residential	SSE	0.53	33°37'58.39"N	75° 2'30.42"E
NQ5	Arigutnoo	Residential	SSE	0.57	33°37'45.32"N	75° 0'53.40"E
NQ6	Government High School, Bonpora	Silent	E	1.42	33°38'40.58"N	75° 3'47.34"E
NQ7	Minor Mineral Block No- 19	Industrial	----	----	33°38'10.00"N	75° 1'47.81"E
NQ8	Brazlo	Residential	NE	0.33	33°38'42.94"N	75° 3'2.25"E

Ambient Noise Standards

Ministry of Environment Forests& Climate Change (MoEF&CC) has notified the noise standards vide gazette notification dated February 14, 2000 for different zones under the Environment Protection Act (1986). These standards are given in **Table-3.5**

Table 3.5 Ambient Quality Standards in respect of Noise

Area Code	Category of Area	Noise dB (A) L_{eq}	
		Daytime*	Night time*
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Daytime is from 6.00 am to 10.00 pm and Night time is from 10.00 pm to 6.00am.
2. Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle hours, loud speakers and bursting of crackers are banned in these zones.

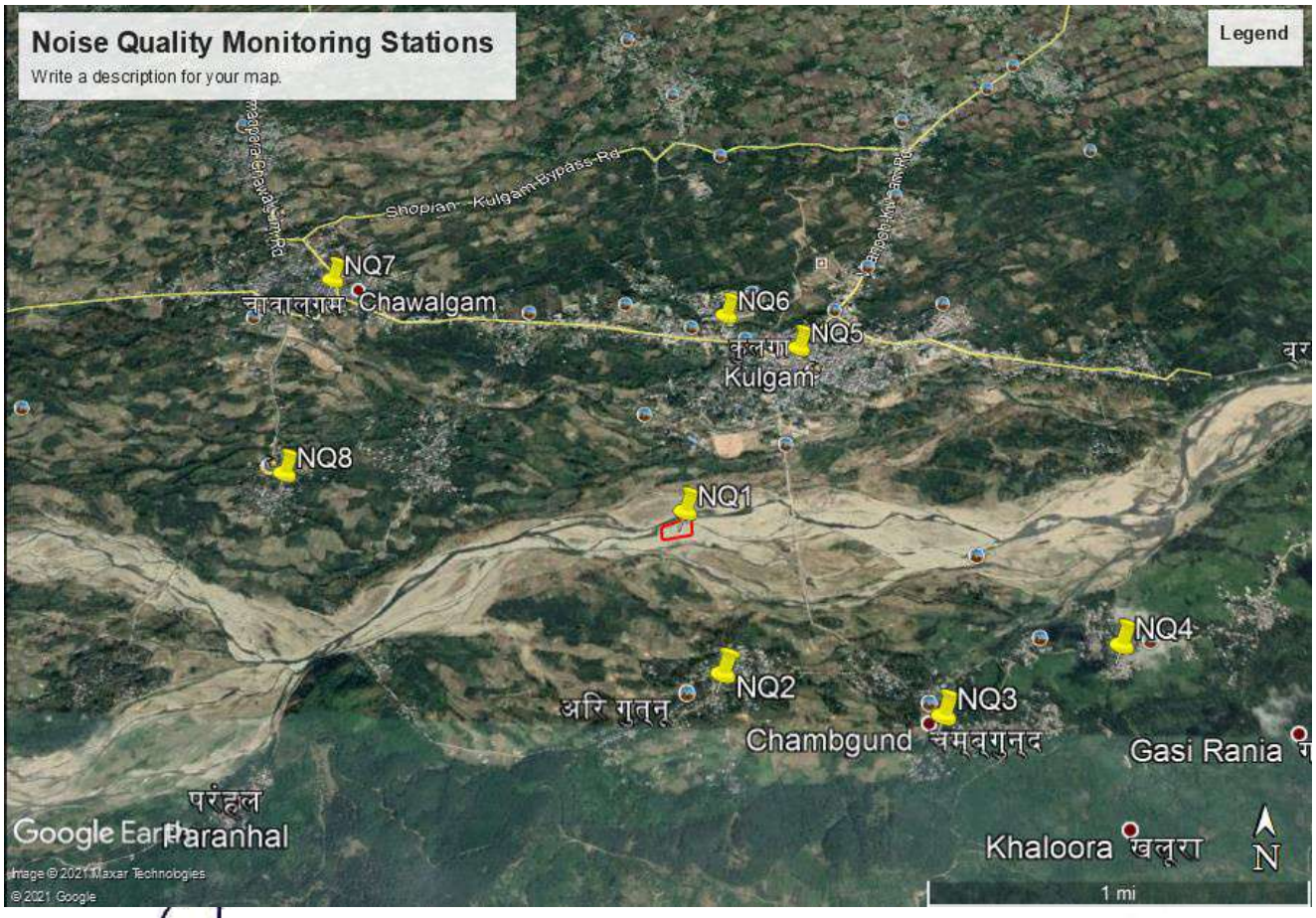

Figure 3.2: Showing Ambient Noise Quality Monitoring Locations marked within the Study Area

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Baseline Scenario

The values of noise observed in some of the areas are primarily owing to vehicular traffic and other anthropogenic activities. Assessment of hourly night time Leq (Ln) varies from 32.7 to 37.9 dB (A) and the hourly daytime Leq (Ld) varies from 40.7 to 50.00 dB (A) within the study area.

Table 3.6: Hourly Leq Noise Level in the Study Area

SI. No.	Monitoring Stations	Zone	Locations	Equivalent Noise Level, dB (A)			
				Observed Value, dB(A)		Prescribed Limit, dB(A)	
				Day	Night	Day	Night
	Core Zone						
1.	NQ1	Industrial	Minor Mineral Block No- 17	68.5	59.5	75	70
	Buffer Zone						
2.	NQ2	Residential	Brazlo	51.0	41.2	55	45
3.	NQ3	Silent	Govt Polytechnic college Kulgam	**48.2**	38.7	50	40
4.	NQ4	Residential	Chitripora	48.9	**37.1**	55	45
5.	NQ5	Residential	Arigutnoo	**51.5**	**46.7**	55	45
6.	NQ6	Silent	Government High School, Bonpora	49.8	38.3	55	45
7.	NQ7	Silent	Government Higher Secondary School Manzgam	46.0	37.0	50	40
8.	NQ8	Residential	Largo	41.6	33.4	55	45

The status of noise quality within the 10 km zone of the study area is, therefore, within the MoEF&CC standards.

3.7 WATER ENVIRONMENT

Water Quality

Surface and groundwater samples were collected from different sources within the study area and some important physical and chemical parameters were considered for depicting the baseline status of the study area. The sources of surface water in the study area is given below-

- Upstream of Vishu Nallah.
- Middle Stream of Vishu Nallah.
- Downstream of Vishu Nallah.

Location for water sampling sites is given in **Table 3.8**

Sampling Frequency and Sampling Techniques

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Parameters for analysis of water quality were selected based on the utility of the particular source of water as per MoEF&CC guidance. Hence quality of ground water was compared with IS: 10500: 1991 (Reaffirmed 1993 With Amendment NO -3 JULY 2010) for drinking purposes. Surface 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 in a 5 liter plastic jerry can and 250 ml sterilized clean glass/pet bottle for complete physico-chemical and bacteriological tests respectively. The samples were analyzed as per standard procedure / method given in IS: 3025 (Revised Part) and standard method for examination of water and wastewater Ed.21st, published jointly APHA, AWWA and WPCF. The surface water quality is compared with CPCB water quality criteria mentioned in **Table** below.

Table 3.7: 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 Coli forms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 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; 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; pH between 6 to 9; 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 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less

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Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 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 each month in the study period. Sampling was done by standard sampling technique as per the Standard Methods. Necessary precautions were taken for preservation of samples.

Water Quality Assessment

Selected water quality parameters for water resource of the study area have been used for describing the water environment and assessing the impacts. Eight ground water samples were collected in the study area to assess the water quality. Water samples also drawn from the hand pumps and open wells and three surface water samples were drawn from Upstream of Vishu Nallah, Middle Stream of Vishu Nallah and Downstream of Vishu Nallah. Sampling locations for water samples are shown in Figure 3.4 and the details of locations are given in **Table 3.8**. The water samples collected from the above locations were analyzed for important major and minor ions, and the analytical results of the water samples were compared with CPCB drinking water standards and the results are shown in **Table 3.9.**

Table 3.8: Location of Water Sampling Sites

Location No.		**Sample collected from**			
Ground Water Samples					
Code	**Locations**	**Distance in Km**	**Direction**	**Latitude**	**Longitude**
GW1	Govt Polytechnic college Kulgam	0.52	NE	33°38'27.50"N	75° 1'8.90"E
GW2	Chitripora	0.53	SSE	33°37'58.39"N	75° 2'30.42"E
GW3	Arigutnoo	0.57	SSE	33°37'45.32"N	75° 0'53.40"E
GW4	Government High School, Bonpora	1.42	E	33°38'40.58"N	75° 3'47.34"E
GW5	Bata Pora Vailoo	0.57	S	33°37'49.85"N	75° 1'59.84"E
Surface Water Samples					
Code	**Locations**	**Distance in Km**	**Direction**	**Latitude**	**Longitude**
SW1	Middlestream Vishu Nallah	---	---	33°38'10.00"N	75° 1'47.81"E

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SW2	Upstream Vishu Nallah	0.95	ENE	33°38'43.05"N	75° 3'28.06"E
SW3	Downstream Vishu Nallah	0.05	SW	33°38'7.70"N	75° 0'14.15"E

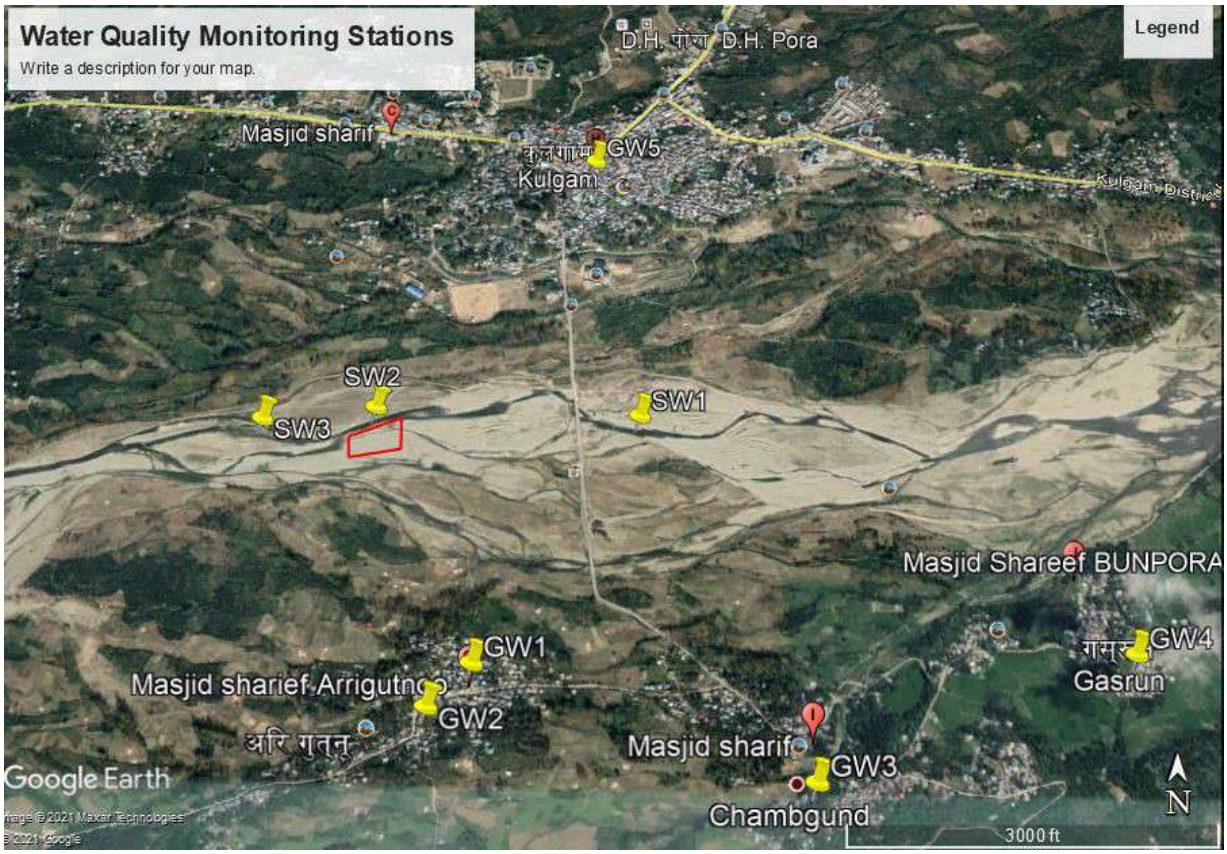

Figure 3.3 Showing Water Quality Monitoring Locations marked within the Study Area.

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Table 3.9: Groundwater Sample Analysis Results during December 2020

S. No.	Test Parameter	Unit	Govt Polytechnic college Kulgam	Chitripora	Arigutnoo	Government High School, Bonpora	Bata Pora Vailoo	Specification/Limit (As per IS:10500: 2012)		Test Method
			GW1	GW2	GW3	GW4	GW5	Desirable	Permissible	
1	Temperature	o C	13	13.3	13.39	13.13	13.39	Not Specified	Not Specified	APHA 2550-B
2	Colour	Hazen	<1.0	<1.0	<1.0	<1.0	<1.0	5	15	APHA 2120-B
3	Odour	…	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	APHA 2150-B
4	Taste	…	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	APHA 2160-C
5	pH	…	7.2	7.4	7.43	7.29	7.43	6.5 - 8.5	No Relaxation	APHA 4500-H+
6	Turbidity	NTU	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1	5	APHA 2130-B
7	Total Dissolved Solids,(TDS)	mg/L	385.6	532.1	435.72	393.3	401.02	500	2000	APHA 2540-C
8	Fluoride,(F)	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	1	1.5	APHA 4500:(F-)-D
9	Total Alkalinity,(CaCO3)	mg/L	185.1	255.4	209.14	188.78	192.49	200	600	APHA 2320-B
10	Total Hardness,(CaCO3)	mg/L	239.1	349.6	270.15	208.45	248.63	200	600	APHA 2340-C
11	Calcium,(Ca)	mg/L	46.3	58.5	56.64	55.06	60.15	75	200	APHA 3500:(Ca)-B
12	Chloride,(Cl)	mg/L	54	95.8	82.78	62.92	68.17	250	1000	APHA 4500:(Cl-)-B
13	Magnesium,(Mg)	mg/L	29.6	48.8	30.84	16.99	23.58	30	100	APHA 3500:(Mg)-B
14	Nitrate,(NO3)	mg/L	N.D.	N.D.	N.D.	N.D.	N.D.	45	No Relaxation	APHA 4500:(NO3-)-B
15	Sulphate,(SO4)	mg/L	32.8	39.9	32.67	31.85	30.07	200	400	APHA 4500:(SO4)-E
16	Boron,(B)	mg/L	ND	ND	ND	ND	ND	0.5	1	APHA 4500:(B)-C

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17	Potassium,(K)	mg/L	19.3	26.6	21.78	19.66	20.05	Not Specified	Not Specified	APHA-3120B
18	Sodium,(Na)	mg/L	57.8	79.8	65.35	58.99	60.15	Not Specified	Not Specified	APHA-3120B
19	Total Nitrogen (as Total NH3-N)*	mg/L	N.D	N.D	N.D	N.D	N.D	Not Specified	Not Specified	APHA 4500:(NH3)-C
20	Total Phosphorus (P)	mg/L	N.D	N.D	N.D	N.D	N.D	Not Specified	Not Specified	APHA 4500:(P)-D
21	Salinity	%	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	Not Specified	Not Specified	APHA 2520B
22	Iron,(Fe)	mg/L	0.5	1	0.81	0.83	0.49	0.3	No Relaxation	APHA-3120B
23	Lead,(Pb)	mg/L	N.D	N.D	N.D	N.D	N.D	0.01	No Relaxation	APHA-3120B
24	Manganese,(Mn)	mg/L	N.D	N.D	N.D	N.D	N.D	0.1	0.3	APHA-3120B
25	Mercury,(Hg)	ug/L	N.D	N.D	N.D	N.D	N.D	0.001	No Relaxation	APHA-3114C
26	Selenium,(Se)	mg/L	N.D	N.D	N.D	N.D	N.D	0.01	No Relaxation	APHA-3120B
27	Zinc,(Zn)	mg/L	N.D	N.D	N.D	N.D	N.D	5	15	APHA-3120B
28	Anionic Detergent,(MBAS)	mg/L	N.D	N.D	N.D	N.D	N.D	0.2	1	APHA 5540-C
29	Mineral Oil	mg/L	N.D	N.D	N.D	N.D	N.D	0.5	No Relaxation	IS 3025 (Part-39)
30	Phenolic Compound,(C_6H_5OH)	mg/L	N.D	N.D	N.D	N.D	N.D	0.001	0.002	APHA 5530-C
31	Total Coliform Count	MPN/100 mL	Absent	Absent	Absent	Absent	Absent	Shall Not Be Detectable		IS 1622
32	Escherichia coli	MPN/100 mL	Absent	Absent	Absent	Absent	Absent	Shall Not Be Detectable		IS 1622

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Table 3.13: Surface water Sample Analysis Results during December 2020

S. No.	Parameter	Unit	SW1 Middlestream Vishu Nallah	SW2 Upstream Vishu Nallah	SW3 Downstream Vishu Nallah	SW4 Canal Near Block 17	Test Method
1	Temperature	o C	12.5	12.3	12.7	12.7	APHA 2550-B
2	Colour	Hazen	< 1	< 1	< 1	< 1	APHA 2120-B
3	Odour	…	Odourless	Odourless	Odourless	Odourless	APHA 2150-B
4	pH	…	7.4	7.3	7.5	7.5	APHA 4500-H+
5	Total Dissolved Solids,(TDS)	mg/L	380.3	275.6	311.4	387.9	APHA 2540-C
6	Biological Oxygen Demand(BOD3d270C)	mg/L	6	4.5	4.8	7.1	IS: 3025 (Part-44)
7	Chemical Oxygen Demand,(COD)	mg/L	9.3	7	7.4	11	APHA 5220-C
8	Calcium,(Ca)	mg/L	43.8	32.9	34.9	51.6	APHA 3500:(Ca)-B
9	Turbidity	NTU	<1.0	<1.0	<1.0	3.5	APHA 2130-B
10	Total Hardness,(CaCO3)	mg/L	174	130.8	138.6	205.3	APHA 2340-C
11	Dissolved Oxygen(DO)	mg/L	11.3	8.5	9	13.3	APHA 4500:(O)-C
12	Anionic Detergent,(MBAS)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 5540-C
13	Magnesium,(Mg)	mg/L	15.5	11.7	12.4	18.3	APHA 3500:(Mg)-B
14	Chloride,(Cl)	mg/L	41	30.8	32.6	48.3	APHA 4500:(Cl-)-B
15	Conductivity	µs/cm	576.3	417.6	471.9	480.6	APHA 2510-B
16	Nitrate,(NO3)	mg/L	0.7	0.5	0.6	0.8	APHA 4500:(NO3-)-B
17	Sulphate,(SO4)	mg/L	48	36.1	38.3	56.7	APHA 4500:(SO4)-E
18	Potassium,(K)	mg/L	17.2	12.9	13.7	20.2	APHA-3120B
19	Fluoride,(F)*	mg/L	0.4	0.3	0.3	0.5	APHA 4500:(F-)-D
20	Chromium,(Cr+6)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 3500:(Cr)-B
21	Cyanide,(CN)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 4500:(CN-)-D
22	Cadmium,(Cd)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 3120B
23	Sodium,(Na)	mg/L	61.3	46.1	48.9	72.3	APHA-3120B

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24	Copper,(Cu)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 3120B
25	Iron,(Fe)	mg/L	0.7	0.5	0.5	0.8	APHA-3120B
26	Boron,(B)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 4500:(B)-C
27	Zinc,(Zn)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA-3120B
28	Manganese,(Mn)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA-3120B
29	Phenolic Compound, (C6H5OH)	mg/L	N.D.	N.D.	N.D.	N.D.	APHA 5530-C
30	Mineral Oil	mg/L	N.D.	N.D.	N.D.	N.D.	IS 3025 (Part-39)
31	Total Coliform Count	MPN/100mL	78	60	90	93.6	IS 1622
32	Fecal Coliform (FC)	MPN/100mL	52	40	60	62.4	IS 1622

3.7.2 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 7.3 to 7.53 and the surface waters are 7.3 to 7.5. 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 limits in absence of alternate source is 2000mg/l, beyond this palatability decreases and may cause gastro intestinal irritation. In ground water samples collected from the study area, the total dissolved solids are varying from 312.6 mg/l to 431.4 mg/l, in the surface water samples collected in the study area were ranging from 275.6mg/l to a maximum of 380.3 mg/l. The TDS of the samples were above the desirable limit but within the permissible limit of 2000mg/l.
- The desirable limit for chlorides is 250 as per IS-10500 Standards whereas permissible limit of the same is 1000 mg/l beyond this limit taste, corrosion and palatability are affected. The chloride level in the surface water samples collected in the study area were ranging from 30.8 mg/l to a maximum of 41 mg/l, in ground water samples 43.8 mg/l to 77.6 mg/l. the chloride samples are within the desirable limits.
- The desirable limit as per IS-10500 Standards for hardness is 300 mg/l where as the permissible limit for the same is 600 mg/l beyond this limit encrustation in water supply structure and adverse effects on domestic use will be observed. In the ground water samples collected from the study area, the hardness is varying from 168.99 mg/l to 283.4 mg/l and for surface water is varying from 130.8 mg/l to 174 mg/l.

Overall all the samples collected from the study area were found to be fit for consumption, Most of ground water samples are well within the permissible limits as per IS-10500. Most of the heavy metals in all samples are below detectable limits.

Based on the results it is evident that most of the parameters of the river samples comply with 'Category C' standards of CPCB indicating their suitability as Drinking water source after conventional treatment and disinfection.

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3.8 SOIL CHARACTERISTICS

The composite soil samples were collected from site and the study area and were analyzed for characterization. The locations of the monitoring sites are depicted in **Table 3.15** and the result of the monitoring and analysis is presented in the **Table 3.16 and Figure 3.5** showing soil sample collection points marked within the study area.

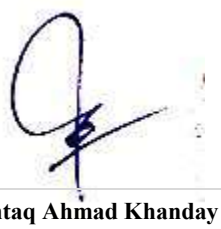
Methodology

The soil samples were collected in the month of Dec 2020. Soil samples were collected from5locations as given in Table 3.15 at each of these locations 4 sub-locations were identified randomly from where soil was collected from 30 cm below the surface. The final samples represent homogenously mixed soil from these 4 sub-locations for each location. The samples were filled in polythene bags, labeled in the field with number and site name and sent to laboratory for analysis.

Particulars	Details
Frequency	One grab sample from each station– once during the Study Period
Methodology	Composite grab samples of the topsoil were collected from 3 depths, and mixed to provide a representative sample for analysis. They were stored in airtight Polythene Bags and analyzed at the laboratory

Table 3.15: Soil Sample Collection Points

Code	Locations	Distance in km.	Direction	Latitude	Longitude
SQ1	Chamgund	0.72	SSW	33°37'46.85"N	75° 1'22.19"E
SQ2	Chitripora	0.53	SSE	33°37'58.39"N	75° 2'30.42"E
SQ3	District Kulgam Hospital	0.95	S	33°38'42.27"N	75° 1'36.69"E
SQ4	Arigutnoo	0.57	SSE	33°37'45.32"N	75° 0'53.40"E
SQ5	Brazlo	0.33	NE	33°38'42.94"N	75° 3'2.25"E



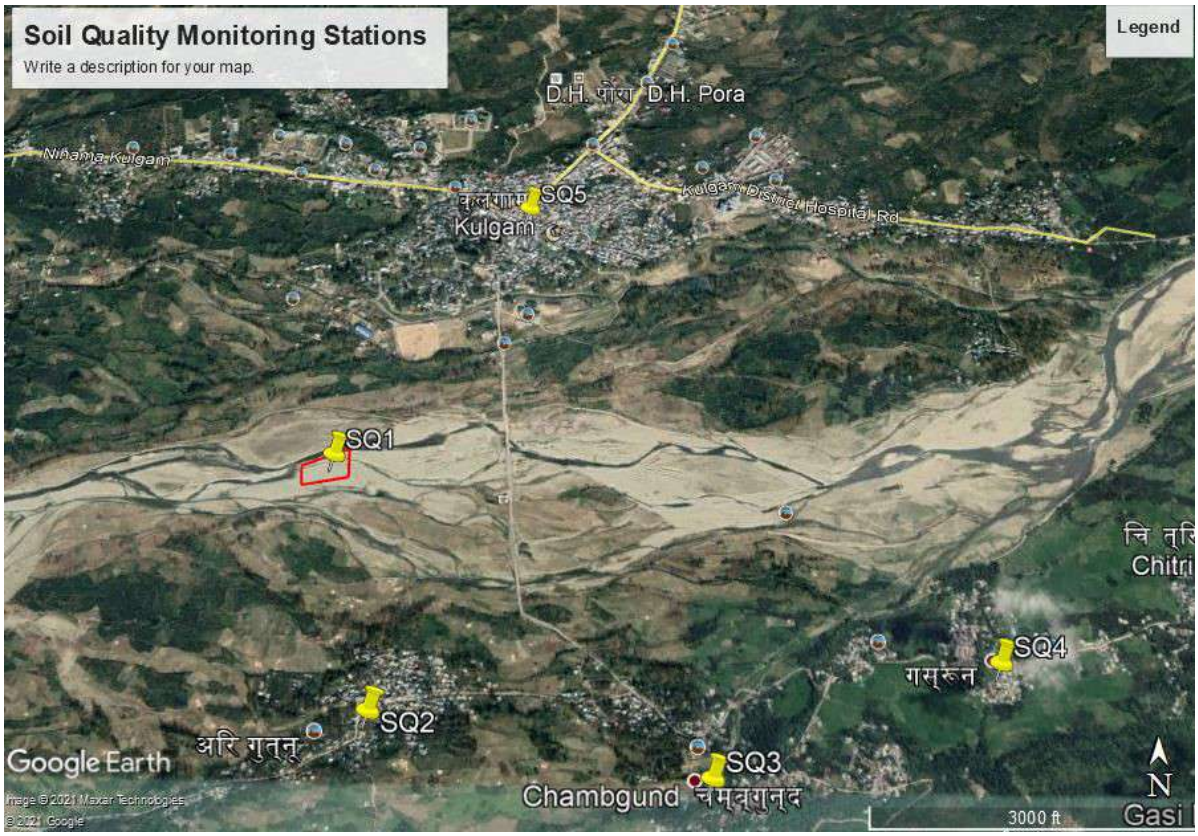


Figure 3.5 Showing Soil Sample Collection Points marked within the Study Area

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Table 3.16 Phyisco-Chemical Properties of Soil

S. No.	Parameters	Units	SW1	SW2	SW3	SW4	SW5	Test Method
1	Texture*	…	Clay Lome	Clay Lome	Clay Lome	Clay Lome	Clay Lome	IS 2720 (Part-4)
2	Sand*	%	23.1	24.9	24.3	28.4	24	IS 2720 (Part-4)
3	Silt*	%	34.3	29	31	19.2	31.7	IS 2720 (Part-4)
4	Clay	%	42.6	46	44.7	52.4	44.3	IS 2720 (Part-4)
5	Electrical Conductivity (EC)*	µs/cm	**32.8**	36.7	33.5	**42**	35.4	IS 14767
6	pH*	…	**7.14**	7.5	7.35	7.28	**7.43**	IS 2720 (Part-26)
7	Bulk Density*	g/cm3	1.39	1.64	1.46	1.71	1.45	IS 2386 (Part-4)
8	Water Holding Capacity (WHC)*	%	8.25	9.7	10.4	10.3	8.6	IS 2720 (Part-2)
9	Sodium,(Na)*	mg/kg	145	161	156.6	147.9	150.8	ETS/STP/SOIL-18
10	Potassium (K)*	mg/kg	81.6	88.1	88.9	83.2	84.9	ETS/STP/SOIL-18
11	Total Nitrogen (N)*	mg/kg	8.7	9.4	9.2	10.9	9	ETS/STP/SOIL-15
12	Chloride,(Cl)*	ml/kg	412.5	449.6	437.3	420.8	429	BS 1377 -3
13	Magnesium,(Mg)*	ml/kg	128.4	138.7	136.1	131	133.5	ETS/STP/SOIL-08
14	Organic Matter,(OM)*	%	1.43	1.6	1.52	1.62	1.49	IS 2720 (Part-22)
15	Aluminum,(Al)	mg/kg	1.18	1.27	1.42	1.22	1.36	ETS/STP/SOIL-18
16	Cadmium,(Cd)*	mg/kg	0.42	0.45	0.5	0.43	0.48	ETS/STP/SOIL-18

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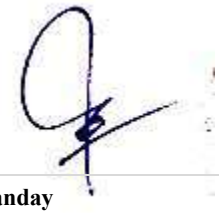
17	Chromium,(Cr)	mg/kg	20.6	24.3	21.6	25.3	21.4	ETS/STP/SOIL-18
18	Copper,(Cu)	mg/kg	1.47	1.59	1.68	1.5	1.53	ETS/STP/SOIL-18
19	Iron,(Fe)	mg/kg	81.3	92.7	87.8	82.9	84.6	ETS/STP/SOIL-18
20	Lead,(Pb)	mg/kg	0.29	0.31	0.31	0.54	0.3	ETS/STP/SOIL-18
21	Manganese,(Mn)	mg/kg	1.45	1.71	1.54	1.48	1.51	ETS/STP/SOIL-18
22	Zinc,(Zn)	mg/kg	4.03	4.4	4.4	4.1	4.2	ETS/STP/SOIL-18
23	Nickel,(Ni)	mg/kg	22.6	40.2	24	28.3	23.5	ETS/STP/SOIL-18
24	Calcium,(Ca)	mg/kg	476.5	657.6	538.4	486	495.6	IS 2720 (Part-23)
25	Phosphorus (PO4)	mg/kg	31.9	44	33.8	39.6	39.9	ETS/STP/SOIL-19



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Results of Analysis of the Soil

Physical characteristics of soil were characterized through specific parameters viz bulk density, porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be slightly alkaline (7.12 to 7.33). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity is (37.2 to 47.6) µmhos/cm.

The soils with low bulk density have favorable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops.

3.9 LAND USE/LAND COVER MAPPING

To assess the land use pattern surrounding the 10 km radius of the site, a detailed study was carried out.

Table 3.13: Land use pattern of Mining area

S.N.	Land Use Pattern	Area (Hectares)	% to the total
1	Settlement	5190.88	16.29
2	Forest	8058.36	25.29
3	River	95.47	0.30
4	Dry Channel	1076.86	3.38
5	Barren land/Waste land	65.85	0.21
6	Plantation	6325.63	19.85
7	Open Scrub	2092.97	6.57
8	Dense Scrub	1741.89	5.47
9	Agricultural land	7216.94	22.65
Total		**31864.85**	**100**

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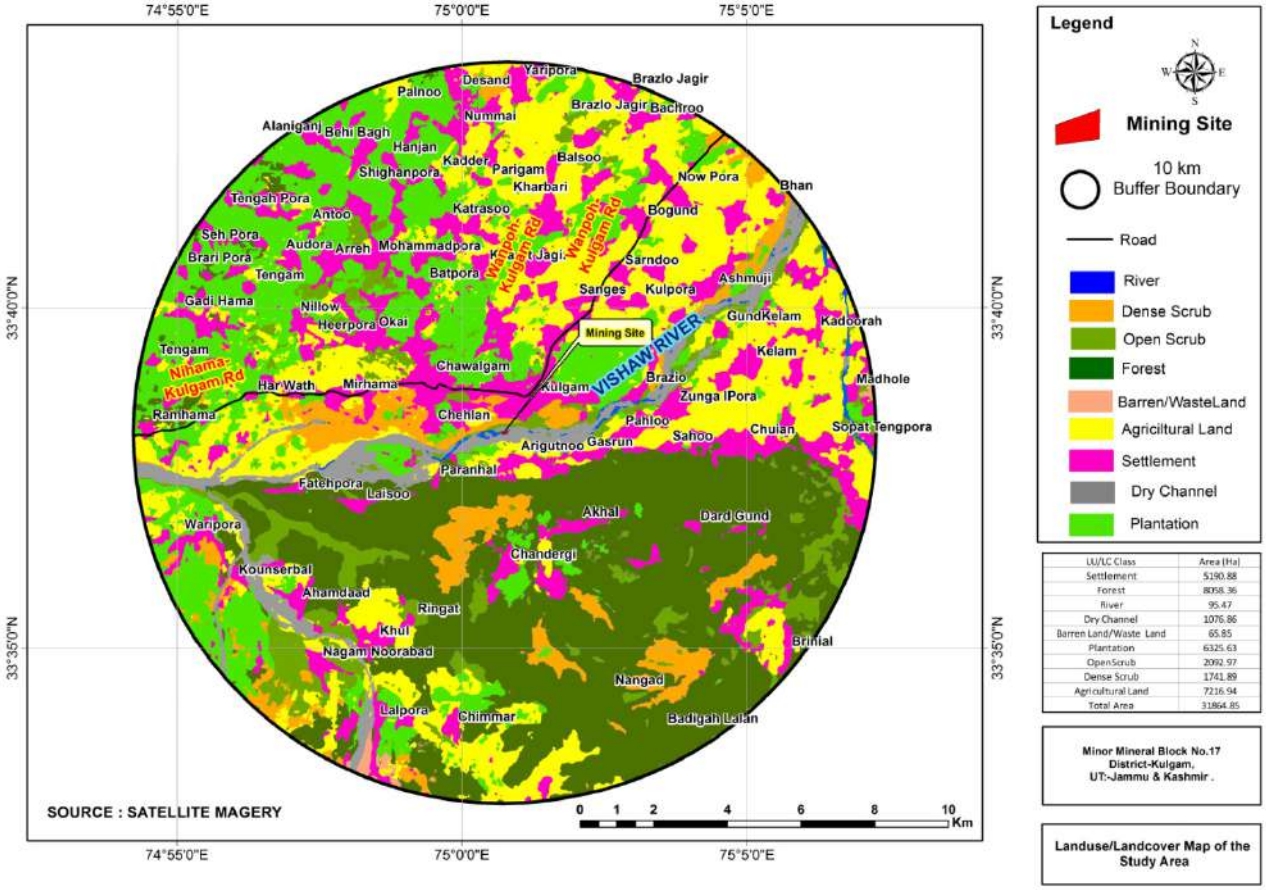

LU/LC Class	Area (Ha)
Settlement	5190.88
Forest	8058.36
River	95.47
Dry Channel	1076.86
Barren Land/Waste Land	65.85
Plantation	6325.63
OpenScrub	2092.97
Dense Scrub	1741.89
Agricultural Land	7216.94
Total Area	31864.85

3.10 Traffic Analysis

Traffic study is carried out for understanding the existing carrying capacity of the road in the vicinity of site and flow towards MDR 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 3.14 (a): Existing Traffic Scenario & LOS

Road	V(PCU/day)	C(PCU/day)	Existing V/C Ratio	LOS
Vicinity of site	96	1800	0.15	A
Road towards Kulgam district	530	6000	0.08	A

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

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The existing Level of Service is Excellent at both site and PWD respectively.

Table.3.14 (b): Table of LOS

Level of Service	Definition	Volume to capacity ratios		Performance
		Freeways	All other roadways	
A	Conditions of free flow; speed is controlled by driver's desires; speed limits, or physical Roadway conditions.	0.0-0.34	0.0-0.34	Excellent
B	Conditions of stable flow; operating speeds beginning to be restricted; little or no restriction on maneuverability from other vehicles.	0.35-0.54	0.35-0.50	Very Good
C	Conditions of stable flow; speeds and maneuverability more closely restricted; occasional backups behind left-turning vehicles at intersections.	0.55-0.77	0.51-0.74	Good / Average / Fair
D	Conditions approach unstable flow; tolerable speeds can be maintained but temporary restrictions may cause extensive delays; little freedom to maneuver; comfort and convenience low; at intersections, some motorists, especially those making left turns, may wait through one or more signal changes.	0.78-0.93	0.75-0.89	Poor
E	Conditions approach capacity; unstable flow with stoppages of momentary duration; maneuverability severely limited.	0.94-0.99	0.90-0.99	Very Poor
Source: San Joaquin County General Plan 2010				

Total Capacity of mine : 17,010 tonnes

No. of working days : 250 days

Average Production per day : 68.04 tonnes

Truck Capacity : 7 tonne approx

No. of truck strips/day : 9.72 trucks approx.

No. of truck trips per day to &for : 9.72 x 2 = 19.44

Increase in PCU per day : 77.76

Table.3.14 (c): Modified Traffic Scenario & LOS

Road	V(PCU/day)	C(PCU/day)	Modified V/C Ratio	LOS
Vicinity of site	96 + 77.76 = 173.76	1800	0.09	A
Road towards Kulgam District	530 + 77.76 = 607.76	6000	0.10	A

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From the above analysis it can be seen that V/C ratio is "excellent" in the vicinity area, whereas for the road approaching Kulgam District is also "excellent". As per the classification the additional load on the carrying capacity of the concerned roads will not have any significant change**.**

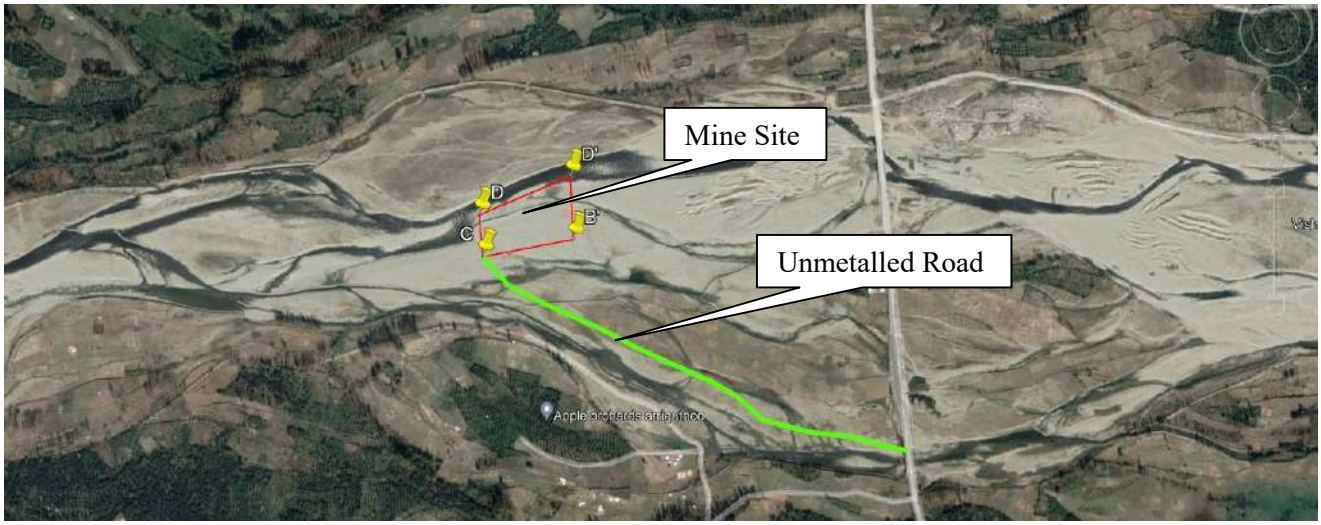

Figure 3.6: Transportation Route Map

3.11 BIOLOGICAL ENVIRONMENT

3.11.1. Introduction:

Biodiversity of reflects the potential of a regional ecosystem. Biota of particular area is considered as indicators of the environment as they quickly respond not only to one environmental factor but also to an interactive group of factors. These communities influence and react sensitively to change in the balance of environmental stresses.

Biological diversity comprises the variability of genus, species and ecosystems and is very crucial for maintaining the basic processes on which the life depends. On the basis of biological physiology biodiversity broadly can be divided into two category i.e. the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine but also contribute in improvement of essential environmental attributes like air, water, soil, etc. Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment nearby the project site.

The study was conducted in the project area to assess all possible consequences on the biological

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environment. Floral and faunal surveys and data collection conducted for assessing the biological diversity and its status over a period of time that forms an integral part of Impact Assessment Techniques. The present study is highlighting the various issues pertaining to floristic diversity and the faunal wealth in the core area i.e. Minor Mineral Block No. 06, District Kulgam, J&K UT and buffer zone i.e. area within 10 km radius.

3.11.1. Objective of the study:

- To collect Baseline data for the study along with a description of the existing terrestrial, wetland and aquatic vegetation.
- To assess scheduled species in the proposed site (Rare, endangered, critically, endangered, endemic and vulnerable).
- To identify locations and features of ecological significance.
- To identify impact of proposed project before, after and during development phase.

3.11.2. Period of Sampling: The ecological survey has been conducted during Post monsoon season for the collection of primary data of flora-fauna, vegetation, soil and other environmental observations. The details are given as below:

Post – monsoon: 1st October, 2020 to 31st December, 2020

Core zone **:** At the project site

Buffer zone **:** Around 10 km radius of the project site

3.11.3. Mode of Data collection: Detailed survey was conducted to evaluate floral composition of the study area. Primary data on floral and faunal composition was record during site visit. The field notes were taken regularly, included habitat, flora, association another appropriate features. Secondary Data Collection was collected from the official websites and published relevant literature.

Table: 3.15 Mode of data collection and parameters considered during the survey

S.No.	Aspect	Data	Mode of Data collection	Parameters Monitored	Remarks
1.	Terrestrial Biodiversity	Primary data collection.	By Field survey	Floral and Faunal diversity	**For Floral Diversity:** Random survey, sapling Survey/forest inventory, Walking transect, collection and Identification with the help of relevant literature.

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					For Faunal Diversity: Direct and indirect sampling, walking transect, point sampling and nest sampling etc. and identification with the help of relevant literature.
2.		Secondary Data Collection	From authentic source like Forests department and available published literatures from ZSI, BSI etc.	Flora and Fauna diversity and study of vegetation, forest type, importance etc.	Data collected from the working plan of the region, forest type from the authentic literature of champion & Seth.
3.	Aquatic Biodiversity	Primary data collection	By field survey	Floral and Faunal diversity	**For Plankton Study** : Lackey's drop method and light microscope. **For other aquatic**: Random survey, opportunistic observations.
4.		Secondary Data collection	From authentic Sources like Forests department.	Floral and Faunal diversity and study of vegetation, forest type, importance etc.	Desktop literature review to identify the representative spectrum of threatened species, population and ecological communities.

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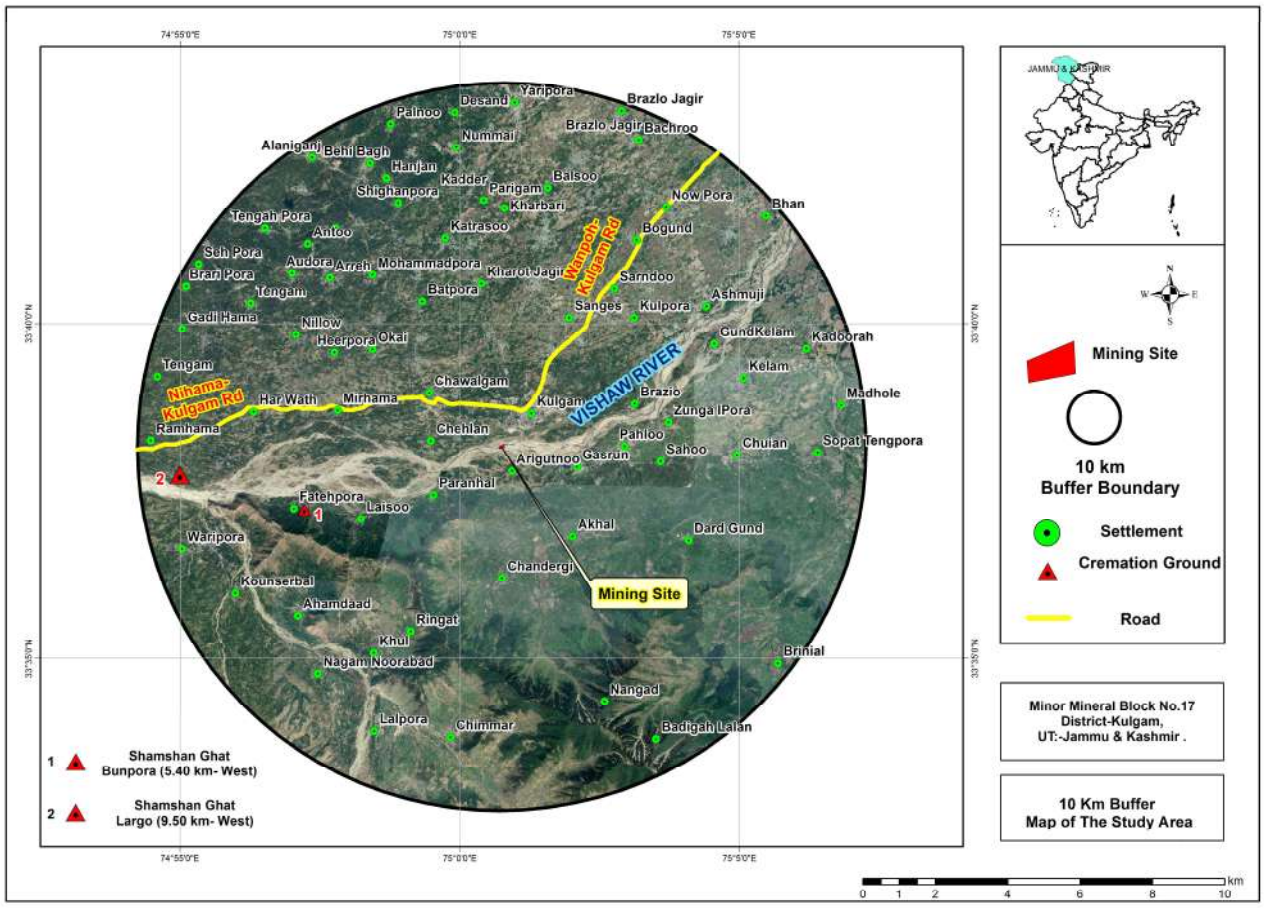
Fig. 3.8: Location Map of Minor Mineral Block No. 17, District Kulgam (J&K UT)



3.11.4. Biological Component of Core Zone :

3.11.4.1 Flora: The applied area is a part of flood plain of Nallah Vishu with almost flat topography where mining is proposed & there is no vegetation within the project site except few bushes.

3.11.4.2 Fauna: During the faunal survey in the area no wildlife corridor or movement of animals was recorded from proposed project area. A list of animals of the study area has been prepared on the basis of local inquiry from the villagers and from the available published literatures. The animals thus recorded were cross checked with Wildlife Protection Act, 1972 for their schedule.

No bird's habitats like nesting, breeding and forging patterns are noticed in the core zone. Local birds are noticed crossing over the area. No fixed pattern in migratory behavior is noticed.

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3.11.5. Vegetation in and Around Human Settlement:

Agricultural crops:

The three main cropping seasons in the district are Kharif, Rabi and Zaid. The other crops raised in the district include wheat, paddy, maize, pulses and oilseeds. Main fruits grown are mango and guava. The autumn or Kharif is usually known as siyari, and the spring or Rabi as Unhari. The Zaid or extra harvest is insignificant in this area. Gram, Wheat, Barley, Peas, Arhar and Masoor are the main crops of Rabi. Jowar, Rice, Bajra, Urad, Moong and Moth arethe main crops of Kharif. Melon, Water-melon, Bitter gourd and Pumpkin are the main crops of Zaid.

3.11. 5.1 Terrestrial Flora of the Buffer Zone

The most common tree species observed in the buffer zone are Cedrus Deodara, Juglans regia, Quercus dilatata, Mangifera indica, etc. A list of different types of plant species observed in during the present investigation is given **Table 3.16**

Sl. No.	Scientific Name	Local Name	Family	Image
1.	*Cedrus Deodara*	Deodar	Pinaceae	
2.	*Quercus leucotrichophora*	Banjh Oak/ Banj Oak	Fagaceae	
3.	*Lyonia ovalifolia*	Angeri	Ericaceae	
4.	*Juglans regia*	Akhrot	Juglandaceae	
5.	*Cornus macrophylla*	Large Leaf Dogwood	Cornaceae	
6.	*Rhus succedanea*	Wax Tree	Anacardiaceae	

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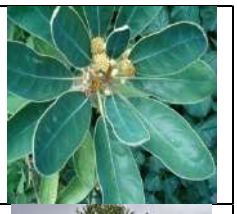
7.	*Litsea umbrosa*	Nees	Lauraceae	
8.	*Betula utilis*	Bhurj	Betulaceae	
9.	*Taxus baccata*	Birmi	Conifer/ Taxaceae	
10.	*Grewia optiva*	Bhimal/Bihul/Dhaman	Tiliaceae	
11.	*Prunus cornuta*	Janmin	Rosaceae (Rose family)	
12.	*Pyrus pashia*	Tangi/Mahal Mol	Rosaceae	
13.	*Pisacia integerrima*	Karkatshringi	Anacardiaceae	
14.	*Celtis australis*	Kharak/European Nettle Tree	Cannanaceae	
15.	*Acaia nilotica*	Babul	Fabaceae	

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16.	*Quercus dilatata*	Mohru	Fagaceae	
17.	*Ficus roxburghii*	Anjeer/ Himalayan Fig Tree	Moraceae	
18.	*Terminalia arjuna*	Arjun	Combretaceae	
19.	*Acacia nilotica*	Kikar	Leguminosae	
20.	*Saccharum bengalense*	Khar	Poaceae	
21.	*Senna sulfurea*	Cassia	Leguminosae	
22.	*Phyllanthus emblica*	Amla	Phyllanthaceae	
23.	*Pinus roxbhurghii*	Chir	Pinaceae	
24	*Bombax ceiba*	Simba	Malvaceae	

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25.	*Platanus orientalis*	Chinar	Platanaceae	

3.11.6 Fauna of the Buffer Zone

A list of animals of the study area has been prepared on the basis of survey and inquiry from local people and from the available published literatures.

Mammals: Many domesticated mammal species are reported from buffer zone during the field survey. Common domestic animals like Buffalo, cow, goat etc. can be noticed in open grass fields while grazing. Small mammals like Indian palm squirrel and field mouse are noticed in vicinity of the village.

Avifauna or Birds: *Monticola solitaries Bulbul*, *Ardea cinerea* etc. were observed. House crow (*Corvus splendens*) & House sparrow (*Passer domesticus*) are of common occurrence.

Reptiles: The reptilian species commonly reported are Garden lizard (*Calotes versicolor*) and *Eutropis macularia* along shady places in agricultural field or where growth of bushes is noticed. Among non-poisonous snakes rat snakes (*Ptyas mucosus*) are commonly noticed in field and Common Babbler is occasionally encountered by the farmers.

Table 3.17 Fauna of the buffer zone

Sl. No.	Scientific Name	English Name/ Common Name	Schedule (WPA,1972)	IUCN Status	Image
		Mammals			
1	*Presbytis entellus*	Common Langur	II	NT	
2	*Nemorhaedus goral*	Grey Himalayan Goral	III	NT	
3	*Ursus thibetanus*	Himalayan Black Bear	II	VU	

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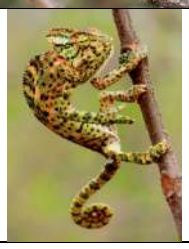
4	*Cuon alpinus*	Wild Dog	II		
5	*Canis aureus*	Jackal	II		
6	*Herpestes javanicus*	Small Indian Mangoose	II		
7	*Felis chaus*	Jungle Cat	II		
Reptiles					
8	*Amphiesma stolatum*	Buffed striped	IV	LC	
9	*Ptyas mucosa*	Rat snake	II		
10	*Oligodon amensis*	Banded Kukri Snake	IV		
11	*Calotes versicolor*	Common Garden Lizard	IV		
12	*Chamaeleo zeylanicus*	Indian Chameleon	II		

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13	*Hemidactylus frenatus*	Common House Gecko	III		
14	*Mabuya dissimilis*	Striped Grass Skink	IV		
15	*Mabuya macularia*	Bronze Grass Skink	IV		
16	*Bungarus caeruleus*	Common krait	IV		
Aves					
17	*Monticola solitaries Bulbul*	Blue Rock Thrush	IV		
18	*Phoenicurus ochruros sparrow*	Black Redstart	IV		
19	*Bubulcus ibis*	Cattle Egret	IV		
20	*Corvus splendens*	Common Crow	V		
21	*Turdoides caudate*	Common Babbler	IV		

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22	*Ardea cinerea*	Grey Heron	IV		

IUCN Status =LC: Least Concern**, NE:** Not Evaluated**, EN:** Endangered**, NT:** Near Threatened, **VU:** Vulnerable

3.11.7 Conclusion:

No species was reported from the project area which is listed under Schedule I of Wildlife Protection Act (WPA), 1972. The project is not likely to affect the terrestrial species as it does not fall into habitat of above mentioned species.

3.12 SOCIO-ECONOMIC ENVIRONMENT

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 adverse, the SEIA will assist the promoter and other stakeholders to reduce, remove or prevent these impacts from happening.

The study area consists of the core area where the proposed project is expected to come up and a buffer area encircling the project area with a radius of 10 kilometers from the periphery of the core area. For every new project, existing projects bound for expansion, modernization and 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 effect may be direct or indirect. Again, the impact may be positive or negative.

3.12.3 Scope of the study

The Scope of socio-economic impact assessment of river bed material leased to 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.

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e) To ensure sustainability of positive impact.

f) To suggest mitigation measures and agency responsible for taking action in case of adverse impact.

3.12.4 Steps taken to prepare the SEIA report

Step 1: Literature review, which includes state profile, district profile, Pre – feasibility report, maps etc.

Step 2: Referring to TOR to get aware of the direction of the State Environment Impact Assessment committee.

Step 3: Identification of the study area and important landmarks therein.

Step 4: Preparation of List of villages and urban areas located in the study area and their distance and direction from the project site.

Step 5: Grouping of villages and urban areas falling under core and buffer area.

Step 6: Site visit to collect the facts through observations

Step 7: Firming up of approach and methodology

Step 8: Finalization of Questionnaires – Listing schedule, Village and Household questionnaire.

Step 9: Collection of secondary data from Census Report, District profile, published and un-published literatures, administrative records etc.

Step10: Data entry and data validation

Step 11: Generation of Tables

Step 12: Data Analysis and preparation of report.

3.12.5 Concept & Definition of Terms used in the report

Study Area: The study area, also known as impact area has been defined as the sum total of core area and buffer area with a radius of 10 Kilometers from the periphery of the project site. The study area includes all the land marks both natural and manmade, falling therein.

Quality of Life: The Quality of Life (QoL) refers to degree to which a person enjoys the important possibilities of his/her life. The 'Possibilities' result from the opportunities and limitations, each person has in his/her life and reflect the interaction of personal and environmental factors. Enjoyment has two components: the experience of satisfaction and the possession or achievement of some characteristic.

Household: A group of persons who normally live together and take their meals from a common kitchen are called a household. Persons living in a household may be related or unrelated or a mix

of both. However, if a group of related or unrelated persons live in a house but do not take their meals from the common kitchen, then they are not part of a common household. Each such person is treated as a separate household. There may be one member households, two member households or multi-member households.

Sex Ratio: Sex ratio is the ratio of females to males in a given population. It is expressed as 'number of females per 1000 males'.

Literates: All persons aged 7 years and above who can both read and write with understanding in any language are taken as literate. It is not necessary for a person to have received any formal education or passed any minimum educational standard for being treated as literate. People who are blind but can read in Braille are also treated as literates.

Literacy Rate: Literacy rate of population is defined as the percentage of literates to the total population aged 7 years and above.

Labour Force: The labour force is the number of people employed and unemployed in a geographical entity. The size of the labour force is the sum total of persons employed and unemployed. An unemployed person is defined as a person not employed but actively seeking work. Normally, the labour force of a country consists of everyone of working age (commencing from 16 years) and below retirement (65 years) that are participating workers, that is people actively employed or seeking employment. People not counted under labour force are students, retired persons and people in prisons stay-at home people permanently disabled persons and discouraged workers.

Work: Work is defined as participation in any economically productive activity with or without compensation, wages or profit. Such participation may be physical and/or mental in nature. Work involves not only actual work but also includes effective supervision and direction of work. The work may be part time or full time or unpaid work in a farm, family enterprise or in any other economic activity.

Worker: All persons engaged in 'work' are defined as workers. Persons who are engaged in cultivation of land or milk production even solely for domestic consumption are also treated as workers.

Main Workers: Those workers who had worked for the major part of the reference period (i.e. 6 months or more in the case of a year) are termed as Main Workers.

Marginal Workers: Those workers who did not work for the major part of the reference period (i.e. less than 6 months) are termed as Marginal Workers.

Work participation rate: The work participation rate is the ratio between the labour force and the overall size of their cohort (national population of the same age range). In the present study the

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

3.12.6 Approach

Research approach plays an important role to decide suitable methodology. It helps to develop effective research design. There are two types of approaches – Deductive and Inductive.

For the preparation of the present report Inductive approach has been adopted. The work started with collection of both primary and secondary data, observed a pattern in the data, developed a hypothesis and finally prepared the report.

3.12.7 Methodology

For Socio-Economic Impact assessment (SEIA) of the proposed River bed mining project which recourse to systematic analysis of various Socio-Economic characteristics, both in terms of quality and quantity. Accordingly, both qualitative and quantitative data was collected through primary and secondary sources. For collection of primary data, a sample survey was conducted across the study area. For collection of secondary data approached the Census Authority in the state for published data/information, visited state and district portal and referred to administrative records of the state and district administration. 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 the rural areas two stage sampling design was adopted. The first stage unit was census villages and the Ultimate Stage Units were households in the selected villages. The villages and households were selected scientifically for collection of information.

In the urban area three stage sampling design was adopted. The first stage unit was town, second stage was municipal wards and ultimate stage unit were households.

Sample Size

The sample size was selected taking into consideration the following factors:

95 % Confidence Limit (Table value: 1.96)

Margin of error (5%) (Table value: 0.05)

Standard deviation (∂)

Design effect

Non-response rate

The Sample size at each level was worked out by applying the following formula:

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n = [z*s/E] ^ 2,

Where z is the z value for the level of confidence chosen, s is the estimated standard deviation and E is the allowable error.

3.12.8 Method of selection of First Stage Units

Probability Proportional to Size (PPS) was adopted to select the villages from the list of census villages. The households were selected by adopting linear systematic sampling method.

Mapping & Listing

In each sample village complete mapping and listing was undertaken. The maps were prepared for the sample villages. These maps are hypothetical and not to the scale. Listing was done in Schedule 0.0. The objective of mapping & listing was to develop a frame for selection of households for sample survey. The Listing of structures was undertaken from south-west corner of the village moving in clock-wise direction and all the structures including hidden structures were covered for listing. Both residential and non-residential structures were listed for the preparation of village frame.

3.12.9 Baseline Data

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

3.12.10 Baseline Data

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

Table 3.21: Demographic Particulars of the Study Area as on 2011

Sr. No.	Village Name	Distance from the Project Site	Direction from the Project Site
1.	Adigan Dewsar	2.15 Km	ENE
2.	Tengam	2.92 Km	N
3.	Nihama	0.71 Km	WNW
4.	Largo Ramahama	1.36 Km	NNE
5.	Khokhar Hama	1.32 Km	NE
6.	Likhdi pora	2.60 Km	NE
7.	Samnoo	2.98 Km	NNE

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8.	Har Wath	3.73 Km	ENE
9.	Damhal Hanji Pora	2.73 Km	ESE
10.	Gaudwana	2.39 Km	ESE
11.	Yaroo	0.68 Km	SW
12.	Wati Gam	1.34 Km	SW
13.	Bathi Pora	0.45 Km	SW
14.	Chogal Pora	1.71 Km	WSW
15.	Mir Wani	2.36 Km	W
16.	Mazgam	2.49 Km	SW
17.	Durhama	2.07 Km	WSW
18.	Chachmolla	1.67 Km	S
19.	Waripora	3.48 Km	ESE
20.	Herdumand Gori	2.39 Km	SSE

Source: Google Earth

3.12.10 Socio-economic Impact of the project

Impact on Demographic composition

The proposed river bed mining project at Tehsil- Kulgam, District- Kulgam 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 river bed mining project at Tehsil- Kulgam, District- Kulgam will provide direct employment up to 50 persons in each block, 24 will be driver, 9 will be operator and 2 will be Supervisory staffs. The Supervisory staffs will include Mines Manager and Supervisor. The project promoter has planned to recruit the semi-skilled and unskilled workers locally. Every effort will be made to recruit and deploy the skilled and Supervisory staffs locally after imparting proper training to them. In rare cases they will be recruited from outside the study area. Besides, the above employment for persons belonging to informal sector will be generated due to opening of the above Nallah bed mine. It is a positive and direct impact of the project since it will provide employment opportunities to the local people.

Impact on Agriculture

No negative impact on agricultural production in the study area is anticipated due to mining of river

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bed material at Tehsil- Kulgam, and District- Kulgam. Hence no agriculture is possible in the lease area due to its sand, boulder and *bajri.*

Impact on road development

Movement of trucks and other vehicles to and fro the mine is expected to increase substantially, when mining will start. The existing roads connecting the river bed with the national and state highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved by making them paved roads. Hence, there is ample scope for road development in and around the mining areas.

Impact on Law & Order

As most of the workers to be employed are local people 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

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

b) **Provision of First Aid:** The first aid treatment shall reflect the hazards associated with the mining of sand, boulder and *Bajri.* The first aiders must be well trained in handling patients working in river bed mining material.

c) **Regular health examination:** For all mine workers regular health examination must be compulsory. The regular health examination will cover 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.)

d) **No work for temporal disabilities:** The workers having temporary disability must stop doing the job till he/she recovers from disabilities.

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

f) **Tie up with the nearest hospital for medical help:** To meet the medical needs of the mine workers tie-ups with nearest hospitals may be made. Efforts will be made to reserve few beds in the above hospitals for the workers of the upcoming mining project. This will ensure timely medical aid to the affected persons.

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g) **Supply of Mask, Gloves:** The workers in the river bed material mine 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.

h) **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.

i) **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 the health institutions.

j) **Special Group Insurance Scheme:** All the mine workers have been planned to be covered under a Group Insurance Scheme of LIC or any other Insurance company.

Perception of the people

During site visit people living in the study area were asked to indicate their perception about the proposed river bed material mining project at Tehsil- Kulgam, District- Kulgam. Majority of them welcomed the project since it would create employment opportunities for the local people. They retorted that by implementing such employment oriented projects the economic condition of the common people can be improved. The overall perception of the people in the study area on the proposed mining project was 'Very Good'. They said that they will welcome the project whole heartedly if employment opportunities in the proposed mining project are guaranteed for the local people.

3.12.11 OCCUPATIONAL PATTERN

The overall percentage of workers in the area is **36.88 %.**

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Table: 3.22 Occupational Patterns of People in Buffer Zone

S. No.	Village Name	Total Population Person	Total Worker Population Person	Total Worker Population Male	Total Worker Population Female	Main Working Population Person	Main Cultivator Population Person	Main Agricultural Labourers Population Person	Main Household Industries Population Person	Main Other Workers Population Person	Marginal Worker Population Person	Non- Working Population Person	Non- Working Population Male	Non- Working Population Female
1.	Adigan Dewsar	1,582	524	365	159	350	114	55	23	158	174	1,058	445	663
2.	Tengam	399	228	113	115	69	39	9	11	10	159	171	91	80
3.	Nihama	1,254	378	313	65	301	148	14	-	139	77	876	373	503
4.	Largo Ramahama	2,407	868	492	376	276	87	9	6	174	592	1,539	715	824
5.	Khokhar Hama	494	200	100	100	86	33	1	-	52	114	294	138	156
6.	Likhdi pora	865	333	188	145	167	121	-	-	46	166	532	240	292
7.	Samnoo	1,278	394	236	158	199	110	12	2	75	195	884	356	528
8.	Har Wath	1,088	244	217	27	143	59	11	12	61	101	844	351	493
9.	Damhal Hanji Pora	4,099	1,066	865	201	832	165	207	37	423	234	3,033	1,212	1,821
10.	Gaudwana	1,308	570	330	240	188	30	41	37	80	382	738	349	389
11.	Yaroo	840	376	224	152	202	83	91	10	18	174	464	200	264
12.	Wati Gam	808	444	231	213	79	37	14	-	28	365	364	158	206
13.	Bathi Pora	745	281	180	101	100	8	5	1	86	181	464	183	281
14.	Chogal Pora	1,500	443	355	88	264	94	39	25	106	179	1,057	411	646
15.	Mir Wani	1,615	932	481	451	159	60	23	1	75	773	683	363	320
16.	Mazgam	5,238	2,054	1,224	830	623	147	26	42	408	1,431	3,184	1,450	1,734
17.	Durhama	248	67	54	13	14	3	3	-	8	53	181	64	117
18.	Chachmolla	490	207	104	103	68	24	6	3	35	139	283	134	149
19.	Waripora	908	337	168	169	145	135	3	-	7	192	571	274	297
20.	Herdumand Gori	1,874	765	444	321	387	283	22	1	81	378	1,109	509	600

Source: https://censusindia.gov.in/2011census/dchb/0113_PART_B_DCHB_KULGAM.pdf

3.12.12 LITERACY

The overall percentage of literate in the area is **47.196%.** Total literate population is **13,706.** The literacy rate of male is **58.50%,** while literacy rate in female is **41.50%.**

Table: 3.23 Literacy Rate around the project site in Buffer zone

S. No.	Village Name	Total Population	Literate Total	Literate Male	Literate Female	Illiterate Total	Illiterate Male	Illiterate Female
1	Adigan Dewsar	1,582	589	337	252	993	473	520
2	Tengam	399	161	93	68	238	111	127
3	Nihama	1,254	575	358	217	679	328	351
4	Largo Ramahama	2,407	1,266	726	540	1,141	481	660
5	Khokhar Hama	494	252	140	112	242	98	144
6	Likhdi pora	865	410	226	184	455	202	253
7	Samnoo	1,278	608	319	289	670	273	397
8	Har Wath	1,088	576	320	256	512	248	264
9	Damhal Hanji Pora	4,099	2,214	1,301	913	1,885	776	1,109
10	Gaudwana	1,308	571	341	230	737	338	399
11	Yaroo	840	421	263	158	419	161	258
12	Wati Gam	808	343	222	121	465	167	298
13	Bathi Pora	745	245	129	116	500	234	266
14	Chogal Pora	1,500	791	501	290	709	265	444
15	Mir Wani	1,615	682	433	249	933	411	522
16	Mazgam	5,238	2,578	1,514	1,064	2,660	1,160	1,500
17	Durhama	248	77	39	38	171	79	92
18	Chachmolla	490	234	137	97	256	101	155
19	Waripora	908	336	190	146	572	252	320
20	Herdumand Gori	1,874	777	430	347	1,097	523	574

Source: https://censusindia.gov.in/2011census/dchb/0113_PART_B_DCHB_KULGAM.pdf

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3.12.13 SOCIAL STRUCTURE

Out of total population, **0 %** is SC population and **0.29958%** is ST Population.

Table: 3.24 Social Structures in Buffer Zone

S. No.	Village Name	Total Population	Scheduled Cast Population			Scheduled Tribes Population		
			Total	Male	Female	Total	Male	Female
1	Adigan Dewsar	1,582	-	-	-	1	1	-
2	Tengam	399	-	-	-	-	-	-
3	Nihama	1,254	-	-	-	-	-	-
4	Largo Ramahama	2,407	-	-	-	-	-	-
5	Khokhar Hama	494	-	-	-	-	-	-
6	Likhdi pora	865	-	-	-	-	-	-
7	Samnoo	1,278	-	-	-	8	3	5
8	Har Wath	1,088	-	-	-	11	1	6
9	Damhal Hanji Pora	4,099	-	-	-	1	1	-
10	Gaudwana	1,308	-	-	-	-	-	-
11	Yaroo	840	-	-	-	-	-	-
12	Wati Gam	808	-	-	-	-	-	-
13	Bathi Pora	745	-	-	-	-	-	-
14	Chogal Pora	1,500	-	-	-	-	-	-
15	Mir Wani	1,615	-	-	-	-	-	-
16	Mazgam	5,238	-	-	-	66	40	26
17	Durhama	248	-	-	-	-	-	-
18	Chachmolla	490	-	-	-	-	-	-
19	Waripora	908	-	-	-	-	-	-
20	Herdumand Gori	1,874	-	-	-	-	-	-

Source: https://censusindia.gov.in/2011census/dchb/0113_PART_B_DCHB_KULGAM.pdf

3.12.14 SEX RATIO

Villages with 10 km Study Area on Google Image

Sex ratio is **947.8961** numbers of females per **1000** males. As per the Census 2011 the male population is **50.61%** while female population is **49.39%** of the total population.

Table: 3.25 Sex Ratio in Buffer Zone.

S. No	Village	No of Households	Total Population	Male	Female	Sex Ratio (females/ males) * 1000
1	Adigan Dewsar	240	1,582	810	772	953.086
2	Tengam	64	399	204	195	955.88
3	Nihama	198	1,254	686	568	827.988
4	Largo Ramahama	381	2,407	1,207	1,200	994.200
5	Khokhar Hama	86	494	238	256	1,075.63
6	Likhdi pora	144	865	428	437	1,021.028
7	Samnoo	213	1,278	592	686	1,158.78
8	Har Wath	160	1,088	568	520	915.49
9	Damhal Hanji Pora	680	4,099	2,077	2,022	973.51
10	Gaudwana	279	1,308	679	629	926.36
11	Yaroo	164	840	424	416	981.13
12	Wati Gam	147	808	389	419	1,077.12
13	Bathi Pora	153	745	363	382	1,052.34
14	Chogal Pora	268	1,500	766	734	958.22
15	Mir Wani	329	1,615	844	771	913.50
16	Mazgam	965	5,238	2,674	2,564	958.86
17	Durhama	42	248	118	130	1,101.69
18	Chachmolla	82	490	238	252	1,058.82
19	Waripora	139	908	442	466	1,054.29
20	Herdumand Gori	305	1,874	953	921	966.42

Source: https://censusindia.gov.in/2011census/dchb/0113_PART_B_DCHB_KULGAM.pdf

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3.12.15 CONCLUSION

The implementation of the river bed mining project at Tehsil - Kulgam, District - Kulgam, and State – Jammu & Kashmir will generate both direct and indirect employment for the local aspirants. The issue of environment clearance to the mine lease holder will make mining of river bed material 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 of the project area to provide employment opportunities to the local people. With the implementation of the proposed river bed mining 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. Thus there will be a gradual shifting of population from agriculture to other sectors of the economy including service sectors.

The study area is still lacking in health and educational facilities. It is expected that same will improve to a great extent with the commissioning of proposed River bed mining project and associated industrial and business activities.

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CHAPTER-IV

ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

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4.0 GENERAL

The mining projects along with other activities in vicinity may influence the existing physical, biological and social components of environment. In case of mining projects, impacts on biodiversity, air pollution, water pollution, waste management and social issues may be associated. These impacts could be minimized up to a significant level when scientific mining procedures, guidelines and rules are taken into account. The nature and characteristics of impacts are required to be taken into consideration while evaluating the magnitude of impacts. Open cast mining activities have different types of impacts on nearby environment with respect to both magnitude and significance. During the working life of mine, air, water, noise and land use are likely to be affected due to mining of minerals and associated activities. The various anticipated impacts and mitigation measures are discussed in this chapter.

Environmental factors ("impacts") associated with, or caused by, mining, as distinct from those associated with the subsequent use of the extracted minerals, are largely confined to relatively restricted areas in the vicinity of the appropriate geological formation and downstream in the catchment where the deposit is located. These impacts would normally be considered to be "direct" impacts that can be linked directly to the mining and ore processing operations.

In contrast, there are many other types of impacts that are associated with mining activities, but do not occur as a direct consequence of the mining activity itself. These would be considered to be "indirect" impacts. A typical example would be the variety of impacts caused by the activities of individuals and organizations that take place in areas peripheral to a mining operation. In several instances, these indirect impacts can exceed the total environmental impact of the original mining operation and thereby require a far greater degree of management attention.

The term "cumulative impacts" is generally applied to those situations where several impacts from different processes and activities combine to exert a greater set of (usually adverse) effects than those that would be predicted from the original activities. An example of this type of situation would be the combination of adverse effects that a community would experience if it were exposed simultaneously to atmospheric emissions of gases, windblown dust and effluent discharged from a mining operation. A second example would be the situation where effluents and discharges from several mining operations or industries in a single catchment exerted a set of combined effects or impacts on the river system draining the basin. In some circumstances, there may be synergistic effects, where the combined (cumulative) effect of two different activities is

greater than would be expected from a simple combination of the two isolated activities. Similarly, there are also certain circumstances where the impacts from two different activities effectively neutralize each other – this situation is often referred to as an "antagonistic" or "counteractive" interaction. Three typical wastes provide a simple example of this type of situation, namely: acid rock drainage, raw sewage and power station ash. Individually, these wastes exert serious adverse impacts on aquatic environments; in combination, however, they neutralize and offset each other so that their combined effect on the aquatic environment is often innocuous.

4.1 IDENTIFICATION OF IMPACTS

The areas of environmental concerns for which the impacts and their predictions are taken into consideration are mainly:

- Land Environment
- Water Environment
- Air Environment
- Noise Environment
- Biological Environment–Ecological Flora and fauna
- Socio economic Environment
- Occupational Health and Safety

The impacts can be further categorized as positive impacts and negative impacts depending upon their nature, potential and magnitude in construction phase and in operation phase.

4.2 METHODOLOGY OF ASSESSMENT

The overall impact on Air, Water, Noise, Soil, Socio Economic, Ecological, Land environment etc. will be assessed. In addition, it will be weighed in positive impact and negative impact created by the project. To estimate the impact produced, a framework has been designed as given ahead:

• Environmental Sensitivity is defined
• Status of work done till date
• Status of activities (in quantitative terms) undertaken during project period.

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4.3 CRITERIA OF ASSESSMENT

A detailed damage to environment resulted due to construction activities assessed by ascertaining weight-age matrix index method. Seven scale of matrix has been fixed ranging major positive (+3) to major negative (-3). Various parameters like land, air, water etc. were assigned scale for assessment of the damage occurred due to construction, operation and proposed construction

Criteria followed to assess the impact is presented in table 4.1 below -

Table 4.1 Assessment criteria of Impact

S. No.	Score	Rating
1.	+3	Major
2.	+2	Moderate
3.	+1	Minor
4.	0	None
5.	-1	Minor
6.	-2	Moderate
7.	-3	Major

4.4 ASSESSMENT OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES DURING CONSTRUCTION PHASE

4.4.1 Land Environment

The proposed extraction of streambed 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 mining and allied activities involved in river bed mining result in creation of temporary haul roads and formation of mined pits inside river, etc. affecting the landuse pattern. In this project, silt and clay are also produced as a constituent of the River-Bed Material, which are considered to be waste.

Anticipated Impacts

1. Undercutting and collapse of river banks.
2. Excessive and unscientific riverbed material mining is a threat to bridges, dams and nearby structures.

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3. River bank cutting and erosion.
4. Upstream erosion as a result of an increase in channel slope and changes in flow velocity.
5. Downstream erosion due to increased carrying capacity of the stream
6. Downstream changes in patterns of deposition.
7. Changes in channel bed and habitat type.

Mitigation Measures

1. Since the project is mainly for sand, *bajri* and boulder excavation (soil deficient), no loss of top soil is involved.
2. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere.
3. Mining will be restricted to the lease area to a maximum depth of 1.0 m from the surface as per the provision of Jammu & Kashmir Minor Mineral Concession, Storage, Transportation of Minerals and Prevention of Illegal Mining Rules, 2016.
4. A barrier of 7.5 m width has been left from the lease boundary as a statutory area and further pit slope shall be maintained below 45°.
5. Safety zones with respect to bridge, hydraulic points and or/embankment as prescribed by the Department of Geology and Mining should be strictly adhered to
6. In this activity, the work is proposed to be done opencast semi-mechanized method. The river bed material (RBM) excavated will be removed by light weight excavators and directly loaded in tippers from the place of excavation to the mineral processing units or construction sites.
7. The mining is planned in non monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
8. Grasses and bushes which have fibrous roots at the first instance are proposed to grown along the banks which enhances the binding properties of the soil. Hence protecting the banks.
9. The systematic and scientific removal of sand, *bajri* and boulder will not cause bed degradation.
10. Restoration of bank will be ensured at the end of mine closure every year.

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Undercutting and collapse of river bank				0				None
Top soil degradation				0				None
Impact on vegetation					+1			Positive
Soil Erosion				0				None
Impact on Soil Quality				0				None

*Impact must be Negative or Positive or None

Conclusion:
As per the scoring matrix, minor positive impact i.e., +1 will be anticipated with project.

4.4.2 Water Environment

Anticipated Impacts

Mining of sand from within or near a river bed has a direct impact on the physico-chemical habitat characteristics. These characteristics include in stream roughness elements, depth, velocity, turbidity, sediment transport and stream discharge. Altering these habitat characteristics can have deleterious impacts on both in-stream biota and associated riparian habitat.

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

1. Alteration of flow patterns resulting from modification of the river bed
2. An excess of suspended sediment
3. Damage to riparian vegetation and in-stream habitat
4. Aquatic life

The disturbance activities can also disrupt the ecological diversity in many ways.

Mitigation Measures

1. Project activity will be carried out only in the dry part of the river bed. Hence, none of the project activities affect the water environment directly.

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2. In the project, it is not proposed to divert or truncate any stream. No proposal is envisaged for pumping of water either from the river or tapping the ground water.
3. In the lean months, the proposed sand mining will not expose the base flow of the river and hence, there will not be any adverse impact on surface hydrology.
4. The deposit will be worked from the top surface to a maximum depth of 1.0 m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well.
5. Further mining will be completely stopped during the monsoon seasons to allow the excavated area to regain its natural profile.

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Impact on surface water quality			-1					Negative
Impact on ground water quality				0				None
Impact on human health				0				None
Intersection of ground water table				0				None
Impact on Aquatic life			-1					Negative

*Impact must be Negative or Positive or None

Conclusion:

As per the scoring matrix, moderate negative impact i.e., -2 will be anticipated with project.

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4.4.3 Air Environment

Emission of fugitive dust is envisaged due to:

i. Mining Activities includes excavation and lifting of minerals. The whole process will be done opencast semi-mechanized. Therefore the dust generated is likely to be insignificant as compared to mining processes involving drilling, blasting, mechanized loading etc.

ii. Transportation of minerals will be done by road using trucks. Fugitive dust emission is expected from the transportation of trucks on the haul roads. Evaluation of fugitive dust emission has been done by using line source model as given below:

Air Modeling

A detailed study on emission sources and quantification of pollutant concentration by means of dispersion modeling is required to access the environmental impact of a mine. On the basis of the predicted increments to air pollutant concentrations, an effective mitigation and environmental plan can be devised for sensitive areas. In case of river bed mining, as there are no blasting and drilling activities, the impacts may only be caused by material handling and transportation activities. The material is mostly wet, and therefore effect is minimal.

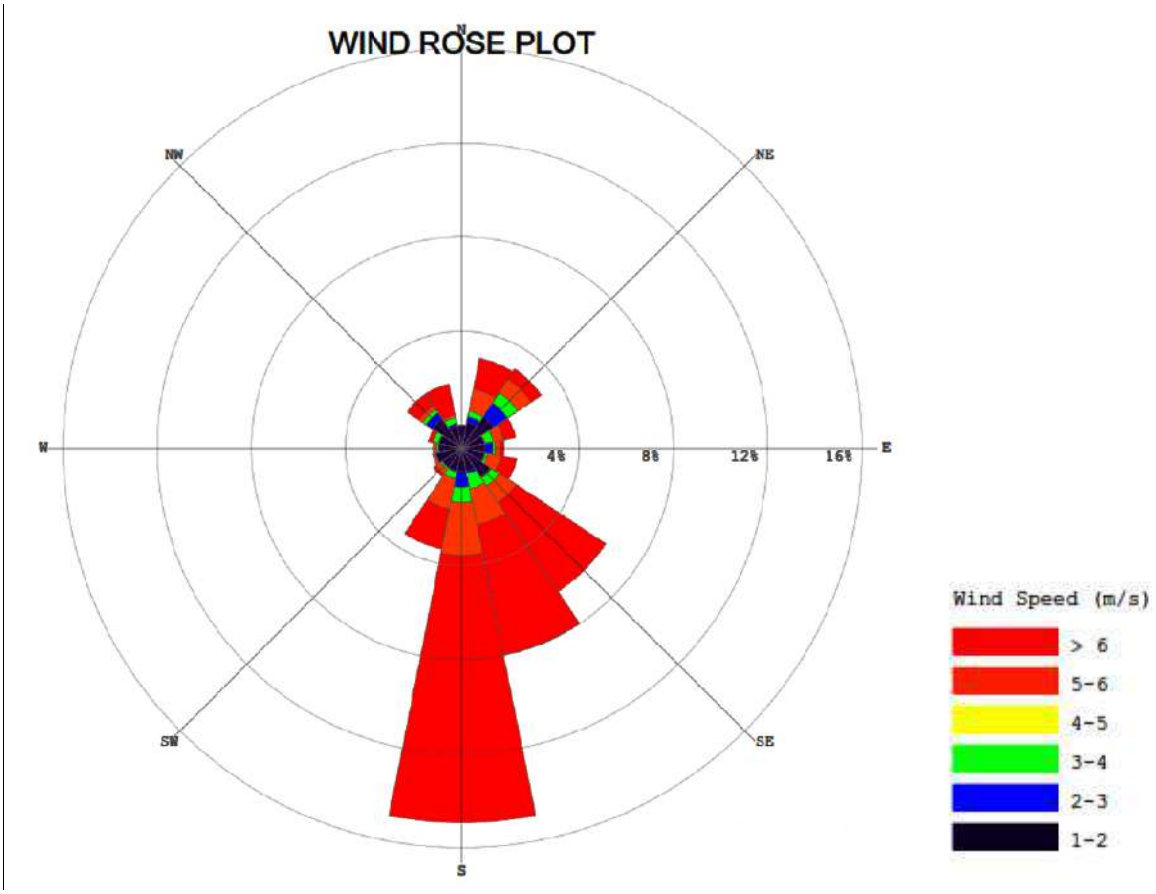

Figure 4.1 Wind-rose Diagram

Mitigation measures

The collection and lifting of minerals will be done manually. 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:

1. Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74% (*Ref. Haul road dust control by WR REED & JA Organiscak*). The same can be seen as shown in the above graph (Fig.4.1).
2. Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
3. Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
4. Deploying PUC certified vehicles to reduce their emissions.
5. Proper tuning of vehicles to keep the gas emissions under check.

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6. Monitoring to ensure compliance with emission limits would be carried out during operation.

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Impact on quality of air			-1					Negative
Mineral Transportation			-1					Negative
Dust Emission			-1					Negative
Human health				0				None
Vehicular Movement		-2						Negative

*Impact must be Negative or Positive or None

Conclusion:
As per the scoring matrix, high negative impact i.e., -5 will be anticipated with project.

4.4.4 Noise Environment

The proposed mining activity is manual 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:

1. Mental disturbance, stress & impaired hearing.
2. Decrease in speech reception & communication.
3. 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:

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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. 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.

Mitigation measures

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

1. The vehicles will be maintained in good running condition so that noise will be reduced to minimum possible level.
2. In addition, truck drivers will be instructed to make minimum use of horns in the village area and sensitive zones.
3. No such machinery is used for mining which will create noise to have ill effects.
4. Awareness will be imparted to the workers about the permissible noise levels & maximum exposure to those levels

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Impact of noise			-1					Negative
Human health				0				None

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Equipment and Machinery Noise		-2						Negative
Vehicular Noise			-1					Negative

*Impact must be Negative or Positive or None

Conclusion:
As per the scoring matrix, high negative impact i.e., -4 will be anticipated with project.

4.4.5 Biological Environment – Ecological Flora & Fauna

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.

River bed mining generates additional traffic, which negatively impairs the environment.

Anticipated Impacts:

1. Excessive and unscientific riverbed sand mining results in the destruction of aquatic and riparian habitat through large changes in the channel morphology.
2. Access roads crossing the riparian areas will have impact on the species disturbing the ecosystem.
3. Mining may drive away the wild life from their habitat, and significantly affect wildlife and nearby residents.
4. Diminution of the quality and quantity of habitat essential for aquatic and riparian species.
5. Reduction in the yield of agriculture due to deposition of dust on the leaves, etc. of the crops.
6. Fragmentation of wildlife habitat and blocking of migratory paths/corridors. Isolation may lead to local decline of species, or genetic.
7. Mining on the streambed, braided flow or subsurface inter-sand flow may hinder the movement of fishes between pools.

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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. 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.
6. No discard of food, polythene waste etc will be allowed in the lease area which would distract/attract the wildlife.
7. No night time mining will be allowed which may catch the attention of wild life.
8. If wildlife are noticed crossing the area, they will not be disturbed at all.
9. Workers will be made aware of the importance o the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.
10. Access roads will not encroach into the riparian zones and if any riparian vegetation cleared off for the mining activity will be restored at the end of closure of mine.

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Impact on the local Flora					+1			Positive
Impact on the local Fauna				0				None
Impact on the Forest land or any eco-sensitive area involved.				0				None
Impact of Aquatic life			-1					Negative

*Impact must be Negative or Positive or None

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Conclusion:

As per the scoring matrix, insignificant impact i.e., 0 will be anticipated with project.

Green Development Plan

Plantation programme will be carried out side boundary limit of lease area on the both the banks of Nallah Vishu in consultation with Soil Conservation Department.

Year- wise plantation programme for first five years is given as under:

Year	Outside B.L.	Along Road	Along Drain	Around Dump	Total
1st	20	Nil	Nil	Nil	20
2nd	20	Nil	Nil	Nil	20
3rd	20	Nil	Nil	Nil	20
4th	20	Nil	Nil	Nil	20
5th	20	Nil	Nil	Nil	20
Total	**100**	**Nil**	**Nil**	**Nil**	**100**

4.4.7 Socio-economic Condition

1. The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement.
2. No public buildings, places, monuments etc exist within the lease area or in the vicinity.
3. The mining operation will not disturb/ relocate any village or need resettlement. Thus no impact is anticipated.
4. The impact of mining activity in the area is positive on the socio – economic environment of region.
5. River Bed Mining Project is providing employment to local population and it will be give preference to the local people whenever there is requirement of man power.

Scale of Matrix / Parameters	Major	Moderate	Minor	None	Minor	Moderate	Major	Impact*
	(-3)	(-2)	(-1)	0	(+1)	(+2)	(+3)	
Loss of habitation				0				None
Immigration/ Emigration of workers				0				None

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Health impacts					+1			Positive
Loss/gain of culture and religion				0				None
Employment Generation							+3	Positive

*Impact must be Negative or Positive or None

Conclusion:
As per the scoring matrix, high positive impact i.e., +4 will be anticipated with project.

4.4.8 Occupational Health and Safety

Occupational Health and Safety professionals develop and coordinate safety and health systems and strategies within organizations. They identify workplace hazards, assess risks to employee health and safety, and recommend solutions. Increasingly, Health and Safety Professionals are also responsible for many of the environmental aspects of their workplace. As this profession matures there is an increased emphasis on risk management strategy and on the development of workplace culture.

Occupational Health and Safety professionals in the minerals industry may perform the following tasks:

1. Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.
2. Periodical medical checkup will be conducted.
3. The collection of minerals from the mine does not cause any occupational ill effects.
4. Any workers health related problem will be properly addressed.
5. Except dust generation there is no source which can show a probability for health related diseases and proper dust suppression will control generation and dispersion.
6. Develop and implement training sessions for management, supervisors and workers on health and safety practices and legislation.
7. Labour will work under supervision with proper safety equipments and safety belt at the mining site.
8. There will be proper barrier zone around the lease area.

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Under Covid – 19 following precautions will be done:

- ✓ Temperature of employees will be checked by Thermometer Gun twice a day and log book for the same will be maintained.
- ✓ Face protection shields along with masks and PPEs and along with sanitizer will be provided.
- ✓ Gloves, masks and hand sanitizers will be provided.
- ✓ Social distance will be maintained.

It is ensured by PP that the updated guidelines of MHA in content of Covid -19 will be followed during Mining operation at Mining site.

Hence, as per the study of areas of environmental concerns and scoring matrix, the overall result comes to have major negative impact anticipated from the project.

4.5 IMPACT MATRIX

Various activities from the Minor Mineral Block No. 17 projects are likely to have some impact on the environmental constituents during its operational phase. The impact assessment matrix given in **Table 4.3** reveals the impact associated with each activity of the project on various environmental parameters during operational phase before any mitigation measures are implanted. To assess the severity of the impacts, they are categorized as follows:

Table 4.8 Overall Scenario of Potential Environmental Impacts

Environmental Parameters	Local	Regional	Short term	Long Term	Reversible	Irreversible	Adverse	Beneficial	No Impact	Significant	Insignificant
Topography									√		
Drainage	√			√	√			√			√
Soil									√		
Water Resources									√		
Water Quality	√		√			√					√
Land Use	√			√		√		√		√	
Air Quality	√		√		√						√
Noise	√		√		√						√
Flora	√	√		√		√		√		√	
Fauna	√			√		√		√		√	
Employment	√			√		√		√		√	
Aesthetic	√			√		√		√		√	

CHAPTER-V

ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

SI.NO.	CONTENTS	Page No.
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5.2	ANALYSIS OF ALTERNATIVE SITE	2/V

5.0 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 Analysis of Alternatives Technology

The mine is operated by opencast manually method of mining. No other alternative technologies can be used because the deposit is soft in nature. Mine will be using eco-friendly measures to minimize the impact of mining on the surrounding environment.

5.2 Analysis of Alternatives Site

No alternate sites are selected as the deposit is found within the Mining lease area and mining is site specific i.e. mining will have to be carried out only where deposit of the said mineral occurs.

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CHAPTER-VI

ENVIRONMENTAL MONITORING PROGRAMME

INDEX

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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:

Parameters	Technique	Technical Protocol
PM_{10}	Gravimetric method	**IS 5182 (Part-XXIII)**
$PM_{2.5}$	Gravimetric method	**ELPL/III/SOP/XXIII**
Sulphur Dioxide	West and Gaeke	**IS-5182 (Part-II)**
Nitrogen Dioxide	Jacob & Hochheiser	**IS-5182 (Part-VI)**
Carbon Monoxide	Non Dispersive Infra Red (NDIR)	**IS-5182 (Part-X)**

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, IS-2296/Class C
- Ground water samples will be analyzed for all the parameters as per IS-10500.

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Surface Water Parameters:

S. No.	Test Parameters	Test Method
1.	Temperature	APHA 2550-B
2.	Colour	APHA 2120-B
3.	Odour	APHA 2150-B
4.	pH	APHA 4500-H+
5.	Total Dissolved Solids, (TDS)	APHA 2540-C
6.	Biological Oxygen Demand (BOD3d27^{o}C)	IS:3025 (Part-44)
7.	Chemical Oxygen Demand, (COD)	APHA 5220-C
8.	Calcium, (Ca)	APHA 35800; (Ca)-B
9.	Turbidity	APHA 2130-B
10.	Total Hardness, (CaCO3)	APHA 2340-C
11.	Dissolved Oxygen (DO)	APHA 4500; (O)-C
12.	Anionic Detergent, (MBAS)	APHA 5540-C
13.	Magnesium , (Mg)	APHA 3500:(Mg)-B
14.	Chloride,(Cl)	APHA 4500:(Cl-)-B
15.	Conductivity	APHA 2510-B
16.	Nitrate,(NO3)	APHA 4500:(NO3-)-B
17.	Sulphate,(SO4)	APHA 4500:(SO4)-E
18.	Potassium,(K)	APHA-3120B
19.	Fluoride,(F)*	APHA 4500:(F-)-D
20.	Chromium,(Cr+6)	APHA 3500:(Cr)-B
21.	Cyanide,(CN)	APHA 4500:(CN-)-D
22.	Cadmium,(Cd)	APHA 3120B
23.	Sodium,(Na)	APHA-3120B
24.	Copper,(Cu)	APHA 3120B
25.	Iron,(Fe)	APHA-3120B
26.	Boron,(B)	APHA 4500:(B)-C
27.	Zinc,(Zn)	APHA-3120B
28.	Manganese,(Mn)	APHA-3120B
29.	Phenolic Compound,(C6H5OH)	APHA 5530-C
30.	Mineral Oil	IS 3025 (Part-39)
31.	Total Coliform Count	IS 1622
32.	Fecal Coliform (FC)	IS 1622

Ground Water Parameters:

S. No.	Test Parameters	Test Method
1.	Temperature	APHA 2550-B
2.	Colour	APHA 2120-B
3.	Odour	APHA 2150-B
4.	Taste	APHA 2160-C
5.	pH	APHA 4500-H+
6.	Turbidity	APHA 2130-B
7.	Total Dissolved Solids,(TDS)	APHA 2540-C
8.	Fluoride,(F)	APHA 4500:(F-)-D
9.	Total Alkalinity,(CaCO3)	APHA 2320-B
10.	Total Hardness,(CaCO3)	APHA 2340-C
11.	Calcium,(Ca)	APHA 3500:(Ca)-B
12.	Chloride,(Cl)	APHA 4500:(Cl-)-B
13.	Magnesium,(Mg)	APHA 3500:(Mg)-B
14.	Nitrate,(NO3)	APHA 4500:(NO3-)-B
15.	Sulphate,(SO4)	APHA 4500:(SO4)-E
16.	Boron,(B)	APHA 4500:(B)-C
17.	Aluminium,(Al)	APHA-3120B
18.	Arsenic,(As)	APHA 3120B
19.	Cadmium,(Cd)	APHA 3120B
20.	Chromium,(Cr)	APHA-3120B
21.	Copper,(Cu)	APHA 3120B
22.	Iron,(Fe)	APHA-3120B
23.	Lead,(Pb)	APHA-3120B
24.	Manganese,(Mn)	APHA-3120B
25.	Mercury,(Hg)	APHA-3114C
26.	Selenium,(Se)	APHA-3120B
27.	Zinc,(Zn)	APHA-3120B
28.	Anionic Detergent,(MBAS)	APHA 5540-C
29.	Mineral Oil	IS 3025 (Part-39)
30.	Phenolic Compound,(C6H5OH)	APHA 5530-C
31.	Fecal Coliform (FC)	IS 1622
32.	Escherichia coli	IS 1622

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.

Soil Quality Parameters:

S. No.	Parameter	Test method
1.	Texture	IS 2720 (Part-04)
2.	Sand	IS 2720 (Part-04)
3.	Silt	IS 2720 (Part-04)
4.	Clay	IS 270 (Part-04)
5.	Electrical Conductivity (EC)	IS 14767
6.	pH	IS 2720 (Part-26)
7.	Bulk Density	IS 2386 (Part-4)
8.	Water Holding Capacity (WHC)	IS 2720 (Part-26)
9.	Sodium, (Na)	ETS/STP/SOIL-18
10.	Potassium, (K)	ETS/STP/SOIL-18
11.	Total Nitrogen (N)	ETS/STP/SOIL-15
12.	Chloride (Cl)	BS 1377-3
13.	Magnesium, (Mg)	ETS/STP/SOIL-08
14.	Organic Matter, (OM)	IS 272 (Part-22)
15.	Aluminum, (Al)	ETS/STP/SOIL-18
16.	Cadmium, (Cd)	ETS/STP/SOIL-18
17.	Chromium, (Cr)	ETS/STP/SOIL-18
18.	Copper, (Cu)	ETS/STP/SOIL-18
19.	Iron, (Fe)	ETS/STP/SOIL-18
20.	Lead, (Pb)	ETS/STP/SOIL-18
21.	Manganese, (Mn)	ETS/STP/SOIL-18
22.	Zinc, (Zn)	ETS/STP/SOIL-18
23.	Nickel, (Ni)	ETS/STP/SOIL-18
24.	Calcium, (Ca)	IS 2720 (Part-23)
25.	Phosphorus (PO4)	ETS/STP/SOIL-19

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.

Ambient Noise Parameters:

S. No.	Parameters	Test Method
1.	Day Time Noise Level	IS: 9989
2.	Night Time Noise Level	IS: 9989

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.

Socio-Economic –

S. No.	Parameters
1.	Demographic structure
2.	Infrastructure resource base
3.	Economic resource base
4.	Health status : Morbidity pattern
5.	Cultural and aesthetic attributes
6.	Education

Ecological Impact

Ecological Impact will be monitored to assess the green belt development and Conversation of Wild life.

Ecological Impact –

S. No.	Parameters
1.	Green Belt
2.	Conservation of Wild Life

6.3 MONITORING SCHEDULE

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

Monitoring Parameters	Frequency of Monitoring
Ambient Air: Ambient Air Quality at appropriate location for PM_{10}, $PM_{2.5}$, SO_2, NO_x • In the vicinity of the mine area. • In the surrounding area covering project site only.	**Six Monthly**
Water: • Drinking water one sample. • Mine area for Water Portability Confirming to Drinking Water Standards IS : 10500:2011	**Six Monthly**
Noise: Day & Night level Noise Monitoring	**Six Monthly**
Soil: Soil Monitoring, Qualitative and quantitative testing/analysis to check the soil fertility, porosity, texture, water holding capacity, etc.	**Six Monthly**

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Socio-economic Condition	**Once in 3 Year**
Ecological Impact	**Once in a Season**

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
2	Water Quality (Surface & Groundwater)	Once a season for 4 seasons in a year
3	Soil Quality	Once in two years on 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	Ecological Impact	Once in a Season

6.4 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Annual budget is very essential for successful implementation of EMP. The EMC will be responsible for the budget allotted to carry on the operating expenses:

S. No.	Proposed Actions	Budget proposed by project proponent (in Lacs)	
		Capital	Recurring
1.	Green belt development	2.00	1.50
2.	Haulage route maintenance	3.00	2.50
3.	Env. Awareness programme	0.00	1.50
4.	Pollution monitoring	0.00	1.75
5.	Occupational Health checkup/treatment of mine workers	2.84	2.75
	Total	**7.84**	**10.00**

6.5 REPORTING SCHEDULES OF THE MONITORING DATA

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

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

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CHAPTER-VII

ADDITIONAL STUDIES

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7.0 PUBLIC CONSULTATION

The public hearing for the Minor Mineral Block No. 17 in village -Kulgam, District Kulgam (J&K UT) was conducted on 16.11.2021, as per the Environment Impact Assessment Notification dated 14th September 2006. The public hearing details are summarized in the **Table-7.1**.

Table-7.1 Public Hearing Details

Particular	Description
Advertisement for Public Hearing ➢ Date of Advertisement in Newspapers	15.10.2021
Date of Public Hearing	16.11.2021 at 10.30 am to 01.00 pm
Venue	At Village : Town Hall Kulgam
Members	**1.**Additional District Magistrate, Kulgam **2**.District Mineral Officer, Department of Geology & Mining, Kulgam **3.**Divisional Officer, Pollution Control Committee, Kulgam

The press notification indicating the date and venue of the public hearing was issued in prominent news papers Viz. Local News Paper with project details inviting suggestions, views, comments and objections from the public regarding Block No. 17, District Kulgam.

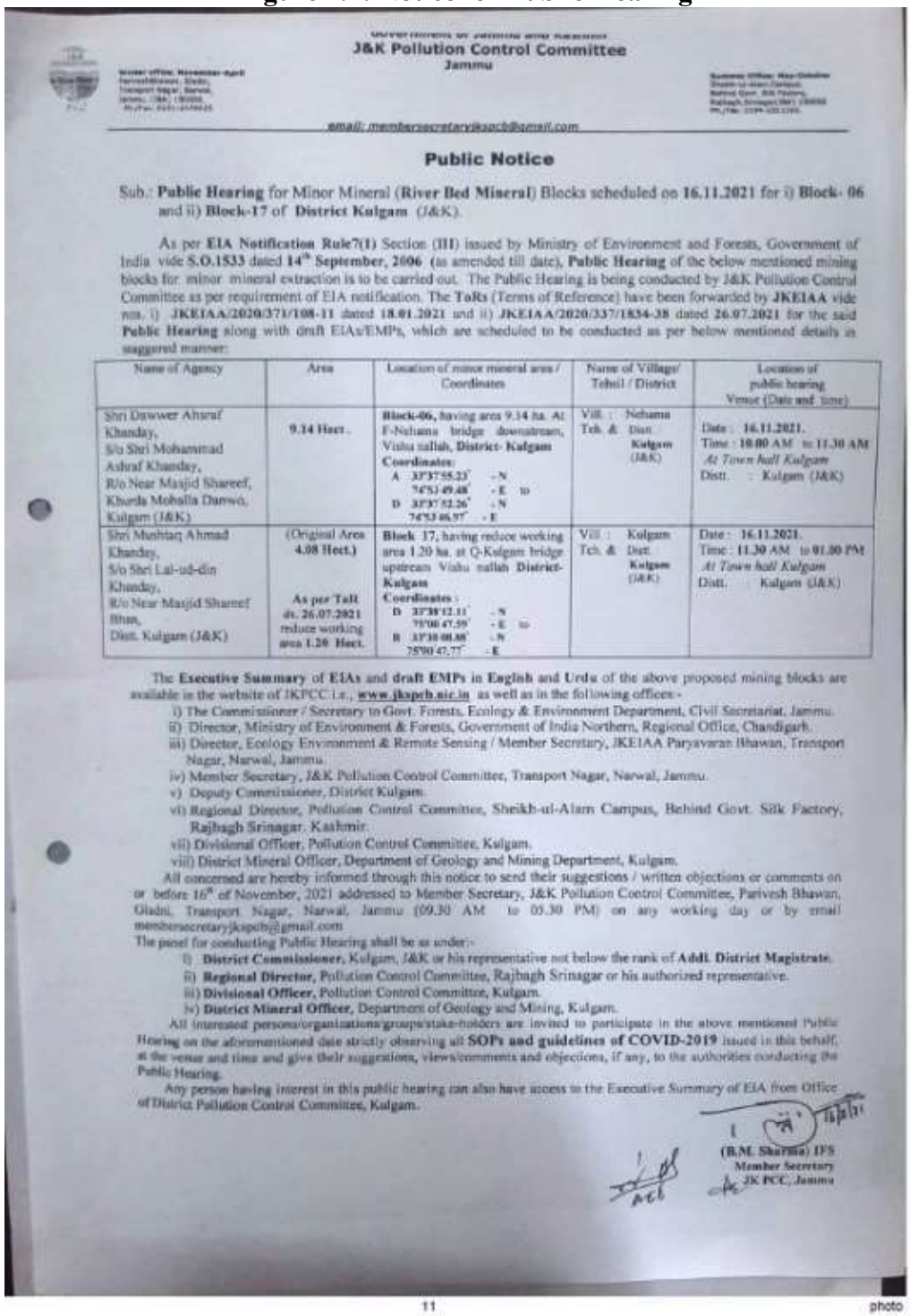
Public hearing meeting was convened by Regional Officer, JKPCB, Kulgam along with the Additional District Magistrate, Kulgam.

Around 50 people attended the public hearing.

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

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 and specific reference to the impacts on environment, its management and social welfare measures including community development activities proposed.

Figure 7.1: Notice for Public Hearing



Government of Jammu and Kashmir
J&K Pollution Control Committee
Jammu

email: membersecretaryjkspcb@gmail.com

Public Notice

Sub.: **Public Hearing** for Minor Mineral (**River Bed Mineral**) Blocks scheduled on **16.11.2021** for i) **Block- 06** and ii) **Block-17** of **District Kulgam** (J&K).

As per **EIA Notification Rule7(1)** Section (III) issued by Ministry of Environment and Forests, Government of India vide **S.O.1533** dated **14th September, 2006** (as amended till date), **Public Hearing** of the below mentioned mining blocks for minor mineral extraction is to be carried out. The Public Hearing is being conducted by J&K Pollution Control Committee as per requirement of EIA notification. The **ToRs** (Terms of Reference) have been forwarded by **JKEIAA** vide nos. i) **JKEIAA/2020/371/108-11** dated **18.01.2021** and ii) **JKEIAA/2020/337/1834-38** dated **26.07.2021** for the said **Public Hearing** along with draft EIAs/EMPs, which are scheduled to be conducted as per below mentioned details in suggested manner:

Name of Agency	Area	Location of minor mineral area / Coordinates	Name of Village/ Tehsil / District	Location of public hearing Venue (Date and time)
Shri Dawwer Ahsraf Khanday, S/o Shri Mohammad Ashraf Khanday, R/o Near Masjid Shareef, Khurda Mohalla Danwo, Kulgam (J&K)	**9.14 Hect.**	**Block-06,** having area 9.14 ha. At F-Nehama bridge downstream, Vishu nallah, **District- Kulgam Coordinates:** A 33°37'55.23" - N 74°53'49.48" - E to D 33°37'52.26" - N 74°53'46.97" - E	Vill. : Nehama Teh. & Distt. : **Kulgam** (J&K)	Date : **16.11.2021.** Time : **10.00** AM to **11.30** AM *At Town hall Kulgam* Distt. : Kulgam (J&K)
Shri Mushtaq Ahmad Khanday, S/o Shri Lal-ud-din Khanday, R/o Near Masjid Shareef Ithan, Distt. Kulgam (J&K)	(Original Area **4.08 Hect.**) **As per ToR dt. 26.07.2021** reduce working area **1.20 Hect.**	**Block 17,** having reduce working area 1.20 ha. at Q-Kulgam bridge upstream Vishu nallah **District-Kulgam Coordinates :** D 33°38'12.11" - N 75°00'47.59" - E to B 33°38'08.88" - N 75°00'47.77" - E	Vill. : Kulgam Teh. & Distt. : **Kulgam** (J&K)	Date : **16.11.2021.** Time : **11.30** AM to **01.00** PM *At Town hall Kulgam* Distt. : Kulgam (J&K)

The **Executive Summary** of **EIAs** and **draft EMPs** in **English** and **Urdu** of the above proposed mining blocks are available in the website of JKPCC i.e., **www.jkspcb.nic.in** as well as in the following offices:-

i) The Commissioner / Secretary to Govt. Forests, Ecology & Environment Department, Civil Secretariat, Jammu.
ii) Director, Ministry of Environment & Forests, Government of India Northern, Regional Office, Chandigarh.
iii) Director, Ecology Environment & Remote Sensing / Member Secretary, JKEIAA Paryavaran Bhawan, Transport Nagar, Narwal, Jammu.
iv) Member Secretary, J&K Pollution Control Committee, Transport Nagar, Narwal, Jammu.
v) Deputy Commissioner, District Kulgam.
vi) Regional Director, Pollution Control Committee, Sheikh-ul-Alam Campus, Behind Govt. Silk Factory, Rajbagh Srinagar. Kashmir.
vii) Divisional Officer, Pollution Control Committee, Kulgam.
viii) District Mineral Officer, Department of Geology and Mining Department, Kulgam.

All concerned are hereby informed through this notice to send their suggestions / written objections or comments on or before 16th of November, 2021 addressed to Member Secretary, J&K Pollution Control Committee, Parivesh Bhawan, Gladni, Transport Nagar, Narwal, Jammu (09.30 AM to 05.30 PM) on any working day or by email membersecretaryjkspcb@gmail.com

The panel for conducting Public Hearing shall be as under:-

i) **District Commissioner,** Kulgam, J&K or his representative not below the rank of **Addl. District Magistrate.**
ii) **Regional Director,** Pollution Control Committee, Rajbagh Srinagar or his authorized representative.
iii) **Divisional Officer,** Pollution Control Committee, Kulgam.
iv) **District Mineral Officer,** Department of Geology and Mining, Kulgam.

All interested persons/organizations/groups/stake-holders are invited to participate in the above mentioned Public Hearing on the aforementioned date strictly observing all **SOPs and guidelines of COVID-2019** issued in this behalf, at the venue and time and give their suggestions, views/comments and objections, if any, to the authorities conducting the Public Hearing.

Any person having interest in this public hearing can also have access to the Executive Summary of EIA from Office of District Pollution Control Committee, Kulgam.

(B.M. Sharma) IFS
Member Secretary
JK PCC, Jammu

11 photo

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Figure 7.2: Photographs Showing Public Hearing

7.1.2 Conclusion on Public Hearing

As there is no further representation from the Public present during public hearing, Regional Officer, JKPCB, Kulgam summed up the Proceedings of the Public hearing and declared the Public Hearing as over. The details of people attended,

representations received in writing during the public hearing are enclosed along with the minutes of the public hearing as **Annexure VIII & IX.**

7.1 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:

i. Elimination of hazards

ii. Substitute something safer

iii. Use engineering/design controls

iv. Use administrative controls such as safe work procedures

v. Protect the workers i.e. by ensuring competence through supervision and training, etc.

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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

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Risk Likelihood Table for Guidance (Table No- 7.1)

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.

Risk Rank Likelihood x Consequence	L1 Almost certain	L2 Likely	L3 Possible	L4 Unlikely	L5 Rare
C1 Catastrophic	25	24	22	19	15
C2 Major	23	21	18	14	10
C3 Moderate	20	17	13	09	06
C4 Minor	16	12	08	05	03
C5 Insignificant	11	07	04	02	01

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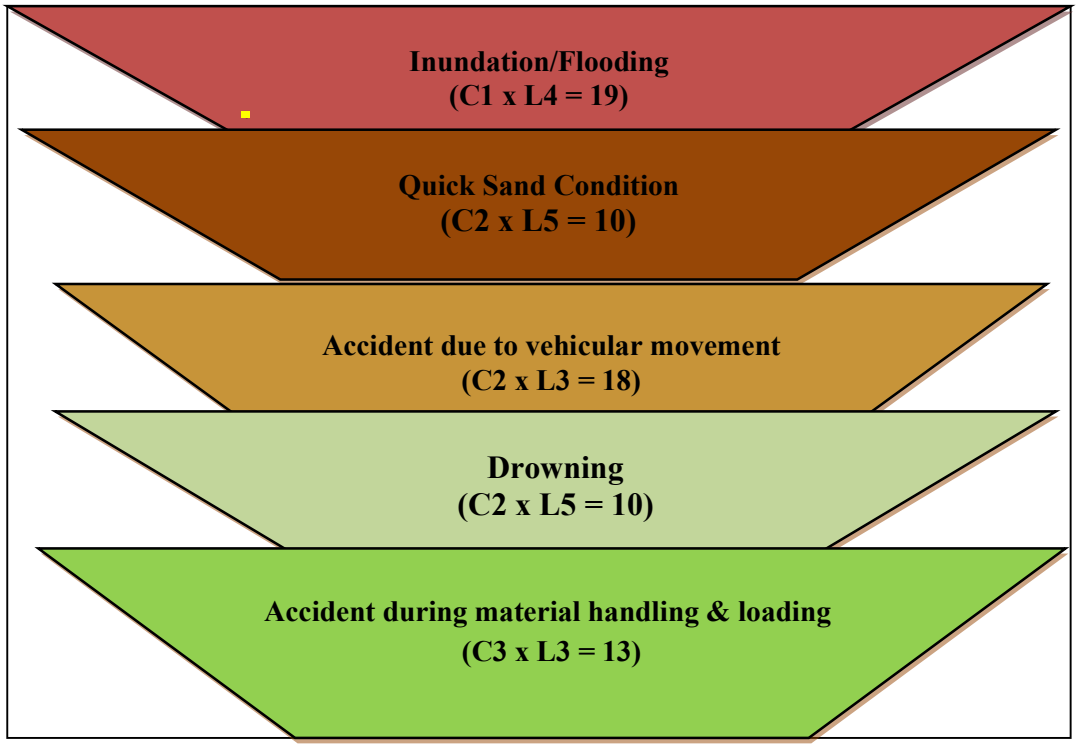
RISK RATING:

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

7.2 RISK ASSESSMENT



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

The key risk (hazard x probability) event **rating** associated with sand bed mining and to assess its consequences of such events occurring and the likelihood based on above Table-2 are as:-

The Risk rating of such hazards is as follows:

7.2.1 INUNDATION/FLOODING

The risk rating assigned to this activity is assigned as '19' i.e., it is possible and will have catastrophic with major consequences, if work started without assessment of the river bed 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.

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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.

7.2.2 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 bed 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.

7.2.3 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.

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5. The maximum permissible speed limit will be ensured.
6. The truck drivers will have valid driving license.

7.2.4 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.

7.2.5 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 river bank 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.

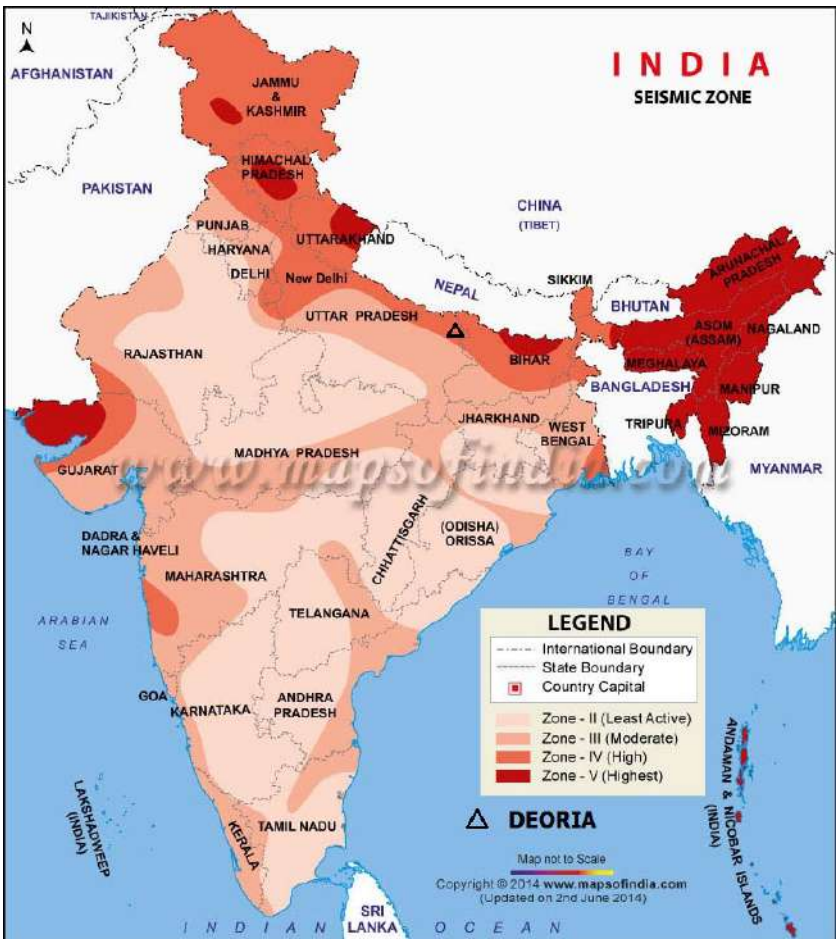
7.3 DISASTERS & ITS MANAGEMENT

7.3.1 Anticipated Disasters & its Mitigation Measures

1. **Floods:** The area is prone to floods. However bank protection has been taken care by the govt. by constructing of flood embankments/retaining walls/check dams, etc.

Precautionary measures will be taken to avoid the effects on the workers at the site if the disaster occurs.

2. **Earth Quake:** The lease area falls in seismic zone V which is moderate intensity zone. However there will be no impact as there is no built-in structure at the site.



(Source: http://www.ndma.gov.in/en/)

7.4 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 kilometers 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 SEIA

The prime objective of the current study is to assess the impact of the proposed project River Bed Mining 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

1. Impact on population composition

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

2. Impact on employment generation

The proposed River Bed Mining Project is expected to provide employment opportunities to workers. It is understood that all the persons to be deployed for various mining activities will be recruited locally and there is very little scope for migration of people from outside the study area.

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The employment potentiality of the project is expected to ameliorate the economic condition of the families of those persons who will get employed in the proposed mining project. However, the River Bed Mining Project will provide seasonal employment. Further, the project will provide indirect employment to about 50 people who will be involved in segregation of extracted mining materials, petty business and service oriented industries.

3. Impact on Health

Extraction of sand, *bajri* & boulder from the river bed poses serious health risks due to dust, quarrying and stone crushing. The effects will vary depending upon the nature of the dust particles, silica content in it and the size of the particles. Pneumoconiosis is an occupational lung disease often caused to miners, due to the inhalation of dust. Silica content in the sand may also lead to Silicosis, which is again an occupational lung disease. Miners may also suffer with occupational respiratory ailments, skin allergies etc, but the same are preventable if exposure is minimized. Further, regular health check-up of the miners is required to prevent any negative impact on their health. In the present River Bed Mining Project, no adverse impact on health is expected if minimum precautions are taken by the miners.

4. Impact on road development

Movement of trucks and other vehicles to and fro the quarry is expected to increase substantially, when mining will start. The existing roads connecting the quarry with the national and state highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved by making them paved roads. Hence, there is ample scope for road development in and around the mining areas.

5. Impact on law & Order

As local people will be employed to run the quarry, 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 is over. 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 project area.

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.

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

c) **Regular Health Examination:** For all mine workers regular health examination will be made compulsory. Treatment for respiratory diseases or asthma, skin diseases, lung function test (pre and post ventolin), Audiograms, Chest X- ray etc., as required will be given.

d) **No work for Temporal Disabilities:** The workers having temporary disability will be asked to stop doing the job till he/she recovers from disabilities.

e) **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.

f) **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.

g) **Supply of Mask and Gloves:** The workers in the 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.

h) **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.

i) **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.

j) **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 River Bed Mining Project Tehsil – Kulgam, District – Kulgam, UT – Jammu & Kashmir will provide employment to local people who are in search of the same. The granting of Environment Clearance to the project will make mining of Sand, *Bajri* and boulder legally valid and it will generate revenue for the state. With the implementation of the

project there will be increase in the employment opportunities for the local villagers. 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 activities.

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CHAPTER-VIII

PROJECT BENEFITS

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8.2	PLANTATION	3/VIII
8.3	HEALTH	3/VIII
8.4	ENVIRONMENTAL BENEFITS	4/VIII

8.0 GENERAL

The continuation of the project will bring overall improvement in the locality, neighborhood and the state by bringing industry, roads, water supply, electricity, employment, living standard and economic growth.

EMPLOYMENT

The socio-economic conditions of the surrounding villages are poor as there is no significant source of earning. The occupational activities are agriculture, cattle rearing and employment in mines but on daily wages. The mining activity will provide employment to local people which will increase socio- economic status of the area.

8.1 IMPROVEMENTS IN PHYSICAL AND SOCIAL INFRASTRUCTURE

The operation of the project will enhance the socio-economic activities in the adjoining areas. This will result in following benefits:-

- Improvements in physical infrastructure.
- Improvements in Social Infrastructure.
- Increase in Employment Potential.
- Contribution to the Exchequer.
- Prevention of illegal mining.
- Enhancement of green cover.

IMPROVEMENTS IN PHYSICAL INFRASTRUCTURE:

The project will improve the physical infrastructure of the adjoining areas. This will include the following:-

- Improved road communication due to opening of the proposed project.
- Strengthening of existing community facilities through the Community Development Programme.
- Pumping of mine water augment the water availability after treatment.
- 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.
- Skill development & capacity building like vocational training, income generation programs and entrepreneurship development program.

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- Literacy program, adult education, assists formation of Village Working Group (VWG), Mahila Mandal etc.
- Awareness program and community activities, like health camps, medical aids, family welfare programs, immunization camp sports & cultural activities, plantation etc.

IMPROVEMENTS IN SOCIAL INFRASTRUCTURE:

There will be some obvious changes in various environmental parameters due to mining activity. Increase socio-economic activities, creation of new employment opportunities, infra-structural development, better educational and health facilities.

Following are the specific impacts:-

Socio-Economic: - There will be positive impact in socio-economic area due to increased economic activities, creation of new employment opportunities, infrastructural development and better educational and health facilities.

Population dynamics: - Due to the direct and indirect employment potential, there is a scope of migration of people into project area and in the peripheral regions; from nearby areas.

Health Care facilities: - Lessee will undertake awareness program and community activities like health, camps, medical aids, family welfare camps, AIDS awareness program, Health checkup will be scheduled in which BP level or sugar level will be measured etc.

Employment Potential: - There is a possibility of creation of direct and indirect employment opportunities due to working of this mine.

INCREASES IN EMPLOYMENT POTENTIAL :

Increase in Employment Potential due to the project activity, Employment opportunities will increase both directly as well indirectly.

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.

PREVENTION OF ILLEGAL MINING:

- SRO-105. - In exercise of the powers conferred by section 15 read with section 23C of the Mines and Minerals (Development and Regulation) Act, 1957, (Central Act 67

of 1957), the Government of Jammu and Kashmir hereby makes the following rules for regulating the grant of various forms of mineral concessions in respect of minor minerals and storage, transportation of minerals and prevention of illegal mining in the State.

- The State Government may, by notification in the Official Gazette, make rules for preventing illegal mining, transportation and storage of minerals and for the purposes connected therewith.
- In particular and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:
- Establishment of check-posts for checking of minerals under transit.
- Establishment of weigh-bridges to measure the quantity of mineral being transported.
- Regulation of mineral being transported from the area granted under a prospecting licence or a mining lease or a quarrying licence or a permit, in whatever name the permission to excavate minerals, has been given.
- Inspection, checking and search of minerals at the place of excavation or storage or during transit.
- Maintenance of registers and forms for the purposes of these rules;

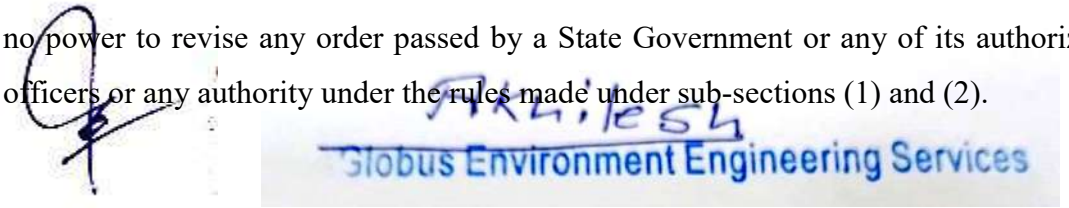
1. Ins. by Act 56 of 1972, s. 13 (w.e.f. 12-9-1972).

2. Ins. by Act 25 of 1994, s. 9 (w.e.f. 25-1-1994).

3. Ins. by Act 38 of 1999, s. 18 (w.e.f. 18-12-1999).

4. Ins. by s. 19, ibid. (w.e.f. 18-12-1999).

- The period within which and the authority to which applications for revision of any order passed by any authority be preferred under any rule made under this section and the fees to be paid therefore and powers of such authority for disposing of such applications; and.
- Any other matter which is required to be, or may be, prescribed for the purpose of prevention of illegal mining, transportation and storage of minerals.
- Notwithstanding anything contained in section 30, the Central Government shall have no power to revise any order passed by a State Government or any of its authorized officers or any authority under the rules made under sub-sections (1) and (2).



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.

8.2 PLANTATION:

Plantation programme will be carried out side boundary limit of lease area on the both the banks of Vishu Nallah in consultation with Soil Conservation Department. Year- wise plantation programme for first five years is given mentioned below:

Table 8.1 Progressive Afforestation during proposal period

Year	Outside B.L.	Along Road	Along Drain	Around Dump	Total
1st	20	Nil	Nil	Nil	20
2nd	20	Nil	Nil	Nil	20
3rd	20	Nil	Nil	Nil	20
4th	20	Nil	Nil	Nil	20
5th	20	Nil	Nil	Nil	20
Total	**100**	**Nil**	**Nil**	**Nil**	**100**

8.3 HEALTH

Periodic medical checkups as per Mines Act/ Rules and other social development and promotional activities will be undertaken. All this will lift the general health status of the residents of the area around mines.

8.4 ENVIRONMENTAL BENEFITS

a. Protecting of river 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 river bank.
e. A check on illegal mining activity.

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CHAPTER-9

COST BENEFIT ANALYSIS

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9.0	Environmental Cost Benefit Analysis	1/IX

9.0 Environmental Cost Benefit Analysis

As per the ToR points issued by JKEIAA
For Minor Mineral Block 17 Vide Letter No. JKEIAA/2020/337/1834-38 Dated 26.07.2021.

For the mining project activity, the 'Environmental Cost Benefit Analysis' is not required.

Henceforth, this chapter is not applicable.

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CHAPTER-X

ENVIRONMENTAL MANAGEMENT PLAN

INDEX

10.0 INTRODUCTION

To mitigate the adverse impacts which are likely to be caused due to the mining operation and overall scientific development of local habitat, environmental management plan (EMP) has been formulated and integrated with the mine planning. The details of the anticipated impacts and mitigative measures have been discussed in Section IV of this report, based on the results of present environmental conditions and environmental impact assessment. The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

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

10.1 LAND USE PATTERN

River bed mining can lead to river bank erosion and sedimentation arising from changes in hydrology due to alteration in water depths and river bed morphology. Sand and gravel in lowland river landforms are biologically important and an economic asset. Keeping this in mind, the following management plans are suggested:

i. The area under mining at a given time will be kept minimum and the area will be reclaimed by top soil.

ii. There will be no mining near the banks. This is to protect the bank erosion and river migration.

iii. Proper wide benches in the mining area will be created to prevent any erosion.

iv. Grass/plants will be planted on the slopes and benches to prevent soil erosion.

10.2 AIR ENVIRONMENT MANAGEMENT

Mitigative measures suggested for air emission control will be based on the baseline ambient air quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to check it vis-à-vis the NAAQS prescribed by MoEF&CC and in cases of non-compliance,

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appropriate mitigative measures will be adopted. In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/ SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area. During the course of mining no toxic substances are released into the atmosphere as such there seems to be no potential threat to health of human beings. In the mining activities, the only source of gaseous emissions is from the engines of vehicles. The reasons may be quality of fuel, improper operation of the engine, etc; proper maintenance of engines will improve combustion process and brings reduction in pollution.

10.2.1 Control of Gaseous Pollution

In mining activities, the only source of gaseous emissions is from the engines of transport vehicles. The emissions from the diesel engines of the machinery can be controlled by proper maintenance and monitoring of machines.

10.2.2 Control of Dust Pollution

The main pollutant in air is PM10, which is generated due to various mining activities. However to reduce the impact of dust pollution the following steps have been taken during various mining activities.

a) During loading operation

i. Latest loading equipment like hydraulic excavators will be used with dumpers. This reduces the number of buckets to fill from height and thus have comparatively less dust generation. The propagation of this dust is confined to loading point only and does not affect any person both the operators of excavator and dumpers who will sit in closed chamber and will be equipped with dust mask.

ii. Skilled operators will operate excavators.

iii. Avoid overloading of dumpers and consequent spillage on the roads.

iv. The operators' cabin in the drills, dumpers will be provided with dust free enclosure and persons working at high dust prone areas will be provided with dust mask.

b) During Transport operation

i) All the haulage roads including the main ramp be kept wide, leveled, compacted and properly maintained and watered regularly during the shift operation to prevent generation of dust due to movement of dumpers, and other vehicles.

ii) Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere.

iii) Regular Compaction and grading of haul roads to clear accumulation of loose material.

iv) Air quality will be regularly monitored both in the core zone and the buffer zone.

c) Plantation work carried out

In order to reduce air pollution in the surroundings, green belt will be developed around mines office, mine approach road. The plantation will be done around the lease boundary.

d) Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of Jammu & Kashmir Pollution Control Board.

10.3 NOISE AND VIBRATION ENVIRONMENT

The ambient noise level monitoring carried out in and around the proposed mine lease area shows that ambient noise levels are well within the stipulated limits of MoEF&CC. There is no drilling and blasting for mineral extraction. Noise pollution will only be due to loading and transporting equipment. Effective steps will be taken to keep the noise level well below the DGMS prescribed limit of 85 dbA.

10.3.1 Noise Abatement and Control

i. Proper maintenance of all machines is being carried out, which help in reducing generation of noise during operations.

ii. No other equipments accept the Transportation vehicles and Excavator and Loaders (as and when required) for loading is allowed.

iii. Noise generated by these equipments is intermittent and does not cause much adverse impact.

iv. Periodical monitoring of noise will be done to adopt corrective actions wherever needed.

v. Plantation will be taken up along the approach roads. The plantation minimizes propagation of noise and also arrests dust.

10.4 WATER MANAGEMENT

There will be no wastewater generation from the mining operations. Only wastewater generation will be sanitary wastewater, which will be treated in septic tank followed by subsurface dispersion.

10.4.1 Surface and Ground Water Management

i. Mining will neither intersect the ground water table of the area. So not at all disturbing water environment.

ii. The mining does not have any impact on topography and natural drainage of surrounding area.

iii. Rain water harvesting pits will be proposed on the mining site.

10.4.2 Waste Water Management

No waste water is generated from the mining activity of minor minerals as the project only involves lifting/excavation of Sand and transportation directly to the consumers.

10.4.3 Water Conservation The projects do not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water. No artificial rainwater harvesting is proposed for the present project.

10.5 SOLID WASTE MANAGEMENT

Waste management is an important facet of environment management. Thus, solid waste management is important from both aesthetics and environment viewpoints.

i. Solid waste (sand and silt) that will be generated during mining activities as spillage will be utilized for filling of the mine voids. Apart from this, no other solid wastes will be generated from the said mining operations.

ii. Generated food waste or any other domestic waste will be collected in dustbins and will be properly disposed off.

iii. There are no toxic elements present in the mineral which may contaminate the soil or river water.

10.6 GREEN BELT DEVELOPMENT

The proposed green belt in the lease area is to be developed taking into consideration the availability of area as the efficiency of green belt in pollution control mainly depends on tree species, its width, distance from pollution sources, side of the habitat from working place and tree height. The proposed green belt has been designed to control PM10, gaseous pollutants, noise, surface run off and soil erosion etc. While considering the above aspects due care will be taken for selecting the suitable characteristics plant

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species such as fast growing, locally suitable plant species, resistant to specific pollutant and those which would maintain the regional ecological balance, soil and hydrological conditions.

Guidelines for plantation: The plant species identified for greenbelt development will be planted using pitting technique. The pit size will be either 45 cm x 45 cm x 45 cm or 60 cm x 60 cm x 60 cm. bigger pit size will be considered at marginal and poor quality soil. Soil used for filling the pit should be mixed with well decomposed farm yard manure or sewage sludge at the rate of 2.5 kg (on dry weight basis) and 3.6 kg (on dry weight basis) for 45cm x 45 cm x 45 cm and 60 cm x 60 cm x 60 cm size pits respectively. The filling of soil should be completed at least 5-10 days before actual plantation. Healthy sapling of identified species should be planted in each pit with the commencement of monsoon. Provision for regular and liberal watering during the summer period during the commissioning stage of the plant will be arranged from the local available resources. The authorities responsible for plantation will also make adequate measures for the protection of the saplings. While making choices of plant species for cultivation in green belt, weight age has been given to the natural native species, bio climatic condition, plants which can be grown as per normal horticultural practices. Plant species identified for greenbelt development, considering the bio-climatic and soil condition.

10.7 SOCIO-ECONOMIC ENVIRONMENT

10.7.1 Management Plan for Socio-Economic Environment

i. In general, socio-economic environment will have positive impact due to the mining project in the area.

ii. The deployed laborers will be from nearby villages only as these people are mainly dependent upon such mining activities.

iii. In order to further improve the socio-economic conditions of the area, the management will contribute for development works in consultation with local bodies**.**

10.8 OCCUPATIONAL HEALTH AND SAFETY

Occupational Health and Safety professionals develop and coordinate safety and health systems and strategies within organizations. They identify workplace hazards, assess risks to employee health and safety, and recommend solutions. Increasingly, Health and Safety Professionals are also responsible for many of the environmental aspects of their workplace. As this profession matures there is an increased emphasis on risk management strategy and on the development of workplace culture.

Occupational Health and Safety professionals in the minerals industry may perform the following tasks:

i. The collection of minor minerals from the River bed mining material does not cause any occupational ill effects.

ii. Except fugitive dust generation there is no source which can show a probability for health related diseases and proper dust suppression will control dust generation and dispersion.

iii. Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.

iv. The occupational health hazards have so far not been reported.

v. Awareness program will be conducted about likely occupational health hazards so as to have preventive action in place.

vi. Any workers health related problem will be properly addressed.

vii. Periodical medical checkup will be conducted.

viii. Promote occupational health and safety within their organization and develop safer and healthier ways of working;

ix. Help supervise the investigation of accidents and unsafe working conditions, study possible causes and recommend remedial action;

x. Develop and implement training sessions for management, supervisors and workers on health and safety practices and legislation;

xi. Coordinate emergency procedures, mine rescues, fire fighting and first aid crews;

xii. Communicate frequently with management to report on the status of the health and safety strategy and risk management strategy, and Develop occupational health and safety strategies and systems, including policies, procedures and manuals.

10.9 COST OF EMP MEASURES

The mining activities involve, excavation, loading, haulage and transportation of mineral. These activities lead to generation of air borne dust, which can cause air pollution in and around the mining lease area, if appropriate control measures are not taken. Similarly mining causes Land Degradation, Noise and Water Pollution etc. in the area.

In order to minimize impacts of mining on different environmental parameters and to keep air and water quality within prescribed limits of CPCB, a rapid Environmental Management Plan (EMP) is prepared to strictly follow it. This helps in resolving all environmental and ecological issues due to mining in the area. The environmental management plan includes all measures and safety precautions necessary for safe mining along with rehabilitation measures for mined out areas.

10.9.1 Estimated Project Cost Along With Analysis In Terms of Economic Viability ofthe Project:

Initial cost of the project has been estimated as 156.75 Lacs.

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S. No.	Description	Unit	Total (Lacs)
1.	Laborers charge (Excavation & Loading)	Rs. 500/day(Man power 50) Assuming 250	62.5 Lacs
2.	Equipment's/Tools/Machineries	250 days Assuming Rs. 5000/day	12.5 Lacs
3.	Royalty Charge paid to Govt. (As per annual production)	Annual	4.25 Lacs
4.	Haulage Road Repair & Maintenance	Annual	3.0 Lacs
5.	Bid Amount as per LOI	--	54.80 Lacs
6.	Env. Clearance processing fee	--	0.4 Lacs
7.	Public hearing fee	--	2.00 Lacs
8.	Surveillance equipment	--	15.00 Lacs
9.	Consultancy fee	--	2.30 Lacs
10.	**Total Project Cost**		**156.75 Lacs**
11.	**EMP Cost**		**7.84 Lacs**
12.	**CER Cost**		**3.13 Lacs**
13.	**Grand Total**		**167.72 Lacs**

10.9 .2 Environment Management Plan

EMP (Environment Management Plan) details for the project.

EMP plan is given below:

Total Cost of the Project = 156.75 Lacs

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

Rs. 156.75 Lacs x 0.05 = **7.84 Lacs**

S. No.	Proposed Actions	Budget proposed by project proponent (in Lacs)	
		Capital	Recurring
1.	Green belt development	2.00	1.50
2.	Haulage route maintenance	3.00	2.50
3.	Env. Awareness programme	0.00	1.50
4.	Pollution monitoring	0.00	1.75
5.	Occupational Health checkup/treatment of mine workers	2.84	2.75
	Total	**7.84**	**10.00**

10.9.3 Corporate Environment Responsibilities:

CER (Corporate Environment Responsibility) details for the project.

CER plan is given below:

Total Cost of the Project = 156.75 Lacs

Yearly CER cost for

The project, i.e. 2% of the total project cost

Rs. 156.75 Lacs x 0.02 = **3.13 Lacs**

S. No.	Project activity	Activities	Annual budget proposed by proponent (in lacs)
1.	Heath/drinking water facility	Free distribution of medicines, health check-up installation of hand pumps	0.88
2.	Electrification	Solar lamp distribution & solar street light installation in the village.	0.88
3.	Sanitation	Construction of ladies; toilets in the village	0.49
4.	Education	Distribution of school bags & books in nearby primary school education grants to girl child to check drop outs in schools.	0.88
5.	Rain water harvesting structure	Construction of rain water harvesting structure in the primary school nearby village.	0.00
6.	Public awareness programme	Awareness program on personal hygiene (covid 19) and distribution of mask and sanitizers	0.00

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	Total		**3.13**

10.9.3 Budget for Surveillance

S. No.	Particulars	Budget recommended by project proponent (In Lacs)	
		Capital (In Lacs)	Recurring (In Lacs)
1.	CCTV Camera	2.0	
2.	Transport Permit	3.0	
3.	Security Guard		1.0
4.	Annual Audit of lease		1.0
5.	Radio Frequency Identification	2.0	0.20
6	Mobile Application	0.50	0.06
7.	Personal Computer with power backup	0.50	0.06
8.	Weight Bridge	7.00	1.5
9.	**Total**	**15.00**	**3.82**

10.10 SUMMARY

As per Above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx 20 trees per year for both leases. It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood

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CHAPTER-XI

SUMMARY AND CONCLUSION

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11.0 INTRODUCTION

Nallah Bed Mining Project is situated at Minor Mineral Block – 17, Q - Kulgam Bridge Downstream, Vishu Nallah, Village: Kulgam, Tehsil: Kulgam, District: Kulgam, and State/UT: Jammu & Kashmir over an area of 1.2 ha for 5 year Lease Period in the favor of Project Proponent Mushtaq Ahmad Khanday. The proposed rate of average production is 17,010 TPA of Sand, *Bajri* & Boulder. The estimated project cost is Rs. 156.75 Lacs.

11.1 ENVIRONMENTAL CLEARANCE:

Environmental Impact Assessment (EIA) is a process, used to identify the environmental, social and economic impacts of a project prior to decision-making. It is a decision making tool, which guides the decision makers in taking appropriate decisions for proposed projects. EIA systematically examines both beneficial and adverse consequences of the proposed project and ensure that these impacts are taken into account during the project designing.

The present case comes under category 'B1' the purview of EIA Notification, MoEF, Govt. of India, New Delhi dated 14th September 2006 and its subsequent amendments thereof and EIA Guidance Manual for Mining (Feb, 2010) of MoEF, Govt. of India. This Draft EIA study has been carried out to assess the environmental, social and economic impacts of the project and formulate action plans to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options.

11.2 TERMS OF REFERENCE:

Terms of Reference has been awarded in favor of Dawwer Ahsraf Khandy (Project Proponent) by J&K Environment Impact Assessment Authority, Jammu & Kashmir for Minor Mineral Block No. 17 and Vide Letter No. JKEIAA/2020/337/1834-38 dated 26.07.2021 over an area of 1.20 Ha. **(Copy of TOR is enclosed as Annexure – II).**

11.3 BRIEF DESCRIPTION OF PROJECT:

A. Project Proponent	
Project Proponent	Mushtaq Ahmad Khandy
Nature of Project	Nallah Bed Mining Project
B. Size of the Project	
Project Name	Minor Mineral Block No. 17

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New/ existing / Renewal mine/ Lease Period	New
Area	1.2 Ha
C. Project Location	
Block No.	Block No. 17
Location	Minor Mineral Block – 17, Q - Kulgam Bridge Upstream, Vishu Nallah, Village : Kulgam Tehsil : Kulgam District : Kulgam UT : Jammu & Kashmir
Geographical Co-ordinates	

Geographical Pillar Co-ordinates	Latitude	Longitude
D’	33°38'12.11"N	75°00'47.59"E
D	33°38'10.14"N	75°00'41.98"E
C	33°38'08.01"N	75°00'42.19"E
B’	33°38'08.88"N	75°00'47.77"E

Survey of India Topo Sheet no.	43 K/14
Life of Mines	5 year
Minable Reserve	85,050 T
Water Requirement	8.6 KLD
Manpower Requirement	50 persons
Present land use at the proposed	The area is a Government Land
D. Environmental Settings Details	
Nearest village	Kulgam
Nearest Town/City	Kulgam
Nearest Railway Station	Panzgom Railway station
Nearest Airport	Sheikh Ul Alam International Airport, Srinagar
Nearest Highway	NH-1A
Ecology Sensitive Zone	There is no ecology sensitive zone present in 10 km
Seismic Zone	Zone V

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11.4 MINING DETAILS:

Particulars	Details
Method of Mining	Opencast Semi-Mechanized
Minable Reserve	85,050 T
Life of Mines	5 years
Bench Height	1.0 m
Water Table	5-10 mBGL
Water Requirement	8.6 KLD
Manpower Requirement	50 persons
No. of Working Days	250 days

Source: Mining Plan & Progressive Mine Closure Plan

11.5 SUMMARY:

Baseline studies have been carried out in the previous chapters as per the provisions of EIA notification 14.09.2006 and its amendments thereof.

One season monitoring has been conducted and all the parameters related to the biotic, physical and socio-economic factors (Land, Water, Air, Biological, Noise, Socio-economic) has been considered and studied. Depending upon the data, values and the study conducted a full proof planned Environment Impact assessment with mitigation; monitoring and Management plan has been given.

All the point given by the JKEIAA, J & K in the Terms of Reference has been complied with along with all the points raised during the public consultation has been addressed.

11.6 CONCLUSION:

As discussed, it is safe to say that the proposed facilities are not likely to cause any significant impact to the ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to serve as biological indicators for the pollutants released from the premises of "River Bed Mining Project.

The proposed Nallah bed mining project will prove beneficial to the local people as direct and indirect employment opportunity will be generated. There will be increase in revenue generation to the government by way of government taxes etc. Further improvement in

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infrastructure will take place like education, roads, availability of drinking water, medical facilities in adjacent villages.

There will be no significant pollution of air, water, soil and noise. Regular monitoring of all the components of environment will be done and according to that the proposed mitigation measures will be adopted. Increased social welfare measures taken by the proponent will bring development in the near-by villages.

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CHAPTER-12

DISCLOSURE OF THE CONSULTANT

The EIA/EMP Report for RBM (River Bed Mineral) Mineral Block No. 17, Area 1.20, and Production Capacity 17,010 TPA with bulk density 2 at Nallah Vishu District Kulgam has been prepared by Globus Environment Engineering Services, Lucknow, and Uttar Pradesh.

Quality Council of India

National Accreditation Board for Education & Training

CERTIFICATE OF ACCREDITATION

Globus Environment Engineering Services, Lucknow
326 - AB, 3rd Floor, Sahara Shopping Center, Lekhraj Crossing, Faizabad Road, Lucknow-226016

Accredited as Category -B 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 opencast only	1	1 (a) (i)	B
2	Building and construction projects	38	8 (a)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated April 13, 2018 posted 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/18/0698 dated June 27, 2018. The accreditation needs to be renewed before the expiry date Globus Environment Engineering Services, Lucknow following due process of assessment.

Sr. Director, NABET *Certificate No.* *Valid till*
Dated: June 27, 2018 NABET/EIA/1821/IA0034 April 03, 2021

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

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