

M/s Aadhya Stone Crusher

Proprietor:-Sh. Raghav Thakur

Village and Post Office Andora, Tehsil Amb, District Una, Himachal Pradesh -

177203, Phone: 9816370002

**To,
The Member Secretary,
HP Pollution Control Board,
HIM PARIVESH, PHASE III, SHIMLA-171009
Himachal Pradesh**

Date:- 05-04-2026

Sub:-Submission of Draft Environmental Impact Assessment (EIA) Report for Public Consultation of Riverbed mining project proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher.

Reference No.:- ToR Identification No.:- T025B0107HP5529278N dated 11-03-2026

Respected Sir,

We are herewith submitting the Draft EIA Report with Annexures and Executive Summary (Hindi & English) in the prescribed format of Ministry of Environment Forests and Climate Change for your kind perusal and consideration to conduct of **Public Hearing**. This is a riverbed mining project for extraction of Sand, Stone and Bajri from Swan River, situated at Khasra Nos. 2873, 2880/1, 2881/1 and 2882, in Mauza Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh. As per EIA Notification, dated 14th September 2006 and amendment made thereof, units fall under **Category 'B1'**. The draft EIA report has been prepared in accordance with standard ToR issued by SEAC, HP and using the **Environmental Baseline Monitoring** conducted during Post monsoon season (**January 2026 to March 2026**) within 10km radius of the project site.

Thus, we are hereby submitting draft EIA & EMP report along with Executive summary in Hindi & English (hard and soft copy) with requisite fee amounting Rs. 5000/- through Original Demand Draft Ref. No. 000848 dated 07-04-2026.

It is requested to take up the case for public consultation as required for the Grant of Environmental Clearance at the earliest.

**Thanking you
For M/s Aadhya Stone Crusher**



Sh. Raghav Thakur (Proprietor)

Authorized Signatory

Encl: - (As Above)



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Arvind Anand
Srinivas Kumar
C14803

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DRAFT EIA REPORT

of

Riverbed Mining for Extraction of Sand, Stone and Bajri from Swan River

Located at

*Khasra Nos. 2873, 2880/1, 2881/1 and 2882, in Mauza/Mohal Ram Nagar,
Tehsil Ghanari, District Una, Himachal Pradesh*

Proposed by

Project Proponent:- Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

Project Schedule:-1(a)(i); Mining of Minerals

Project Area:- 2.0569 Ha.

Production Capacity:- 67500 TPA

Category:-B1'

ToR File No.:- TO25B0107HP5529278N dated 11th March 2026

Baseline monitoring Period :- January to March 2026

Monitoring Done By:- Noida Testing Laboratories

NABL Certificate No:- TC-6814

PREPARED BY



**ENVIRONMENTAL CONSULTANT
SHIVALIK SOLID WASTE MANAGEMENT LIMITED**

**CEI/ NABET Certificate No: NABET/EIA/23-26/RA 0310 valid up
August 17th, 2026**



**Address: SCO 20-21, 1st floor, Near Hotel Dolphin, Dhakoli,
Zirakpur, (Punjab)- 140604**

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ANNEXURE XI:- BASELINE MONITORING REPORTS

ANNEXURE XII:- DISTRICT SURVEY REPORT OF UNA

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

ToR LETTER



सत्यमेव जयते

File No: HP SEIAA/2025/1364
Government of India
Ministry of Environment, Forest and Climate Change
(Issued by the State Environment Impact Assessment
Authority(SEIAA), HIMACHAL PRADESH)



Dated: 11/03/2026

To,

Raghav Thakur
Village and post office Andora, Tehsil Amb, District Una, Himachal Pradesh, 177203
r934292@gmail.com

Subject:

Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding.

Sir/Madam,

This is in reference to your application for Grant of Terms of Reference under the provision of the EIA Notification 2006-regarding in respect of project Riverbed Mining project for the Extraction of Sand, Stone, and Bajri from Swan River, proposed by Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher submitted to Ministry vide proposal number SIA/HP/MIN/557399/2025 dated 07/11/2025.

2. The particulars of the proposal are as below:

(i) TOR Identification No. TO25B0107HP5529278N
(ii) File No. HP SEIAA/2025/1364
(iii) Clearance Type TOR
(iv) Category B1
(v) Project/Activity Included Schedule No. 1(a) Mining of minerals
Riverbed Mining project for the Extraction of Sand, Stone, and Bajri from Swan River, proposed by Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher
(vi) Name of Project
(vii) Name of Company/Organization Raghav Thakur
(viii) Location of Project (District, State) UNA, HIMACHAL PRADESH
(ix) Issuing Authority SEIAA
(x) Applicability of General Conditions no
(xi) Applicability of Specific Conditions no

a) Proposal No. SIA/HP/MIN/557399/2025, Fresh TOR
HP SEIAA/2025/1364
b) Processing fee UTR reference no. 113728207291 on dated 06/11/2025 having amount of Rs. 20,000/-

c) Project type Extraction of Sand, Stone & bajri.
d) Project Location Khassa No 2873, 2880/1, 2881/1 and 2882 falling in Mauza/Mohal Ram Nagar in Tehsil-Ghamari, District- Una, Himachal Pradesh.
e) Jambhudi Jambhudi for the year 2020-2021
f) Land Status Private land/river bed
g) Capacity 67,500 MT/year
h) Mining Area 02-05-69 Hectare
i) Leases with in 500 meter from the periphery of the area applied. Two mining leases exist within 500 meters, 1. M/s Gunpati Stone Crusher, 03-55-11 ha 2. M/s Rama Stone Crusher, 02-09-01 ha
j) Letter of Intent Lol issued on dated 24.05.2025, valid for two year.

- In view of the particulars given in the Para 1 above, the project proposal interalia including Form-1(Part A and B) were submitted to the Ministry for an appraisal by the State Environment Impact Assessment Authority(SEIAA) Appraisal Committee (SEIAA) in the Ministry under the provision of EIA notification 2006 and its subsequent amendments.
- The above-mentioned proposal has been considered by State Environment Impact Assessment Authority(SEIAA) Appraisal Committee of SEIAA in the meeting held on 25/02/2026. The minutes of the meeting and all the Application and documents submitted [(viz. Form-1 Part A, Part B, Part C EIA, EMP)] are available on PARIVESH portal which can be accessed by scanning the QR Code above.
- The brief about configuration of plant/equipment, products and by products and salient features of the project along with environment settings, as submitted by the Project proponent in Form-1 (Part A, B and C)/EIA & EMP Reports/presented during SEIAA are annexed to this EC as Annexure (1).
- The SEIAA, in its meeting held on 25/02/2026, based on information & clarifications provided by the project proponent and after detailed deliberations recommended the proposal for grant of Terms of Reference under the provision of EIA Notification, 2006 and as amended thereof subject to stipulation of specific and general conditions as detailed in Annexure (2).
- The SEIAA has examined the proposal in accordance with the Environment Impact Assessment (EIA) Notification, 2006 & further amendments thereto and after accepting the recommendations of the State Environment Impact Assessment Authority(SEIAA) Appraisal Committee hereby decided to grant Terms of Reference for instant proposal of M/s. Raghav Thakur under the provisions of EIA Notification, 2006 and as amended thereof.
- The Ministry reserves the right to stipulate additional conditions, if found necessary.
- The Terms of Reference to the aforementioned project is under provisions of EIA Notification, 2006. It does not tantamount to approvals/consent/permissions etc. required to be obtained under any other Act/Rule/regulation. The Project Proponent is under obligation to obtain approvals/clearances under any other Acts/ Regulations or Statutes, as applicable, to the project.
- This issues with the approval of the Competent Authority.

Copy To

- The Secretary (Environment), Ministry of Environment, Forests & Climate Change (MoEF&CC), GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003.
- The Chairman, Central Pollution Control Board, Him Parivesh Bhawan, CBD-cum-office Complex, East Arjun Nagar, New Delhi-110032.
- The Chairman, Himachal Pradesh State Pollution Control Board, Shimla-171009.
- The Director (Environment, Science & Technology) to the GoHP, Shimla-171001.
- The Adviser (IA), MoEF&CC, GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003.
- The Integrated Regional Office, MoEF&CC, CGO Complex, Shivalik Khand, Longwood, Shimla, HP-171001.
- The Monitoring Cell, MoEF&CC, GoI, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi - 110003
- Record File.

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Annexure 1

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Shivalik Solid Waste Management Ltd.

SSWML-EIA-F:6-II (h) Issue 01 Dated 15.07.2023 Amd. 00,00,00.0000

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

S. No	Terms of Reference
	land use should be given
1.11	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
1.12	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
1.13	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
1.14	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
1.15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given
1.16	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
1.17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves (existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished
1.18	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 RFT Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost
1.19	Proximity to Areas declared as Critically Polluted or the Project areas likely to come under the Arwali Range (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered
1.20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies

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Standard Terms of Reference for (Mining of minerals)

1.

S. No	Terms of Reference
1.1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994
1.2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given
1.3	All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee
1.4	All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone)
1.5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics
1.6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority
1.7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it 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
1.8	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
1.9	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
1.10	Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of

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Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

S. No	Terms of Reference
1.29	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
1.30	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
1.31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution
1.32	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
1.33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report
1.34	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
1.35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spell 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
1.36	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
1.37	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
1.38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project
1.39	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
1.40	Details of litigation pending against the project, if any, with direction /order passed by any Court of

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S. No	Terms of Reference
	demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority)
1.21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report
1.22	One season (non-monsoon) [i.e. March-May (Summer Season), October-December (post monsoon season) ; December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given
1.23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map
1.24	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
1.25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided
1.26	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
1.27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided
1.28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished

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S. No	Terms of Reference
	Law against the Project should be given
1.41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out
1.42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report
1.43	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
1.44	Besides the above, the below mentioned general points are also to be followed:- a) All documents to be properly referenced with index and continuous page numbering. b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated. c) 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. d) Where the documents provided are in a language other than English, an English translation should be provided. e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted. f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed. g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation. h) 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. i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area
1.45	<ol style="list-style-type: none"> The project proponent shall include the detailed analysis of GLC-2.5 with air modeling and shall prepare the wind-rose diagram of the site to plan the installation of PCDDs. The project proponent will assess and ensure that, after ceasing mining operations, to undertake re-grassing the mining area and any other area which may have been disturbed due to their mining activities and for restoration of the land to a condition which is fit for growth of fodder, flora, fauna etc. The project proponent shall conduct and submit a comprehensive mineral replenishment study to assess the rate and extent of natural replenishment of minerals in the leased area. The project proponent shall submit a certificate from the Director (Industries) to the fact that the proposed mining site is recommended/approved on the basis of the District Survey Report prepared & approved by SELAA authorities in conformity with the SO No. 141 (E), SO No. 3611(E) and as per Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020 published by MoEF&CC, GoI. Hard copy of the application along with the relevant document shall be ink signed & submitted in the office of SELAA Secretariat. The project proponent shall submit compliance report to the issue raised during public hearing.

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S. No	Terms of Reference
	<p>7) The project proponent shall submit proposed EMP and including CER activities as its part. All the commitment made under EMP & CER shall be made in the form of affidavit.</p> <p>8) The project proponent must ensure that environmental samples are analyzed at laboratories located in close proximity to the project site to maintain the accuracy and integrity of results. During each sampling activity, videography and geo-tagged photographs must be captured to provide transparent evidence of proper sampling locations, methods, and handling practices.</p>

Additional Terms of Reference

N/A

Annexure 2

Details of Products & By-products

Name of the product /By-product	Product / By-product	Quantity	Unit	Mode of Transport / Transmission	Remarks (eg. CAS number)
Sand, Stone and bajri	Sand, Stone and bajri	67500	Tons per Annum (TPA)	Road	This production total 67,500 includes waste

Signature Not Verified

Digitally Signed by Sh. Juniti Chand Rana
Member Secretary, SPAA

Date: 11/03/2026

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Shivalik Solid Waste Management Ltd.

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COMPLIANCE OF TOR

The below table gives the compliance of Terms of Reference issued vide ToR identification No. TO25B0107HP5529278N dated 11.03.2026 by the State Level Expert Appraisal Committee (SEAC), Himachal Pradesh for proposed Riverbed Mining project for extraction of Sand, Stone and Bajri situated at Khasra Nos. 2873, 2880/1, 2881/1 and 2882, in Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher. The Point wise compliance of TOR is as under:-

S.no.	Terms of Reference	Cross Ref. in EIA Report
1	Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.	New Project
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.	Letter of Intent attached as ANNEXURE- V
3	All documents including approved mine plan, EIA and Public hearing, should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	All documents, i.e., Approved mine plan, letter of Intent and other documents are compatible with one another in terms of the mine lease area 2.0569 Hectare production 67500 TPA of Sand, Stone & Bajri. 6750 TPA of silt/clay will be generated as a waste. Draft EIA report is prepared for conducting of the Public Hearing
4	All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features	Complied and Included in Chapters 2 & 3.

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

	of the study area (core and buffer zone).	
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of landforms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	A 1:50,000 scale geomorphology map is provided in Chapter 2, with land use patterns detailed in Chapter 3.
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	Yes, the land is allotted for mining as per State policy.
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 company has well laid down Environment Policy & shall comply with all its requirement attached as Annexure-X .

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8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope Study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	This is the case of mining from riverbed; All the safety measure is given in Chapter - 7
9	The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine/lease period.	The 10 Km zone from periphery of the lease has been considered as the study area. silt/clay will be generated as a waste during the process of mining which is detailed in the Chapter -2
10	Land use of the study area is 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 map 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 given in Chapter - 3
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.	Not applicable, as Proposed project is Riverbed mining
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	DFO letter attached as ANNEXURE-VII

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	Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	
13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	Not applicable, no forest land is involved.
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.	Not applicable.
15	The vegetation in the RF/PF areas in the study area, with necessary details, should be given	Complied; Details of the Biological Environment of the study area is incorporated in Chapter-3
16	A study shall be done to ascertain the impact of the Mining Project on wildlife in the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required should be worked out with cost implications and submitted.	The details are provided in Chapter 3 .
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km	Not Applicable Not applicable. No such ecological zones exist within 10 km. DFO certification attached as Annexure-VII .

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	of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with the 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.	Complied Details of the Biological Environment of the study area is incorporated in Chapter - 3
19	Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Department should be secured and furnished to the	Not applicable.

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	effect that the proposed mining activities could be considered.	
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL, HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not applicable.
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need-based sample survey, familywise, should be undertaken to assess their requirements, and action programs 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.	Not applicable. As the project is located on the riverbed, no displacement is involved; therefore, no R&R plan is required.

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22	<p>One season (non-monsoon) [i.e., March-May (Summer Season); October-December (post monsoon season); December-February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.</p>	<p>Baseline data and meteorological details included in Chapter 3. PM10 composition also provided.</p>
23	<p>Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used, and input parameters used for modeling should be provided.</p> <p>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</p>	<p>Air quality modeling is incorporated in Chapter 4, while the wind rose is included in Chapter 3.</p>

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	showing pre-dominant wind direction may also be indicated on the map.	
24	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.	Water requirement for the project is 1.39 KLD, comprising 0.67 KLD for domestic (drinking) purposes and 0.72 KLD for dust suppression. The details are incorporated in Chapter 2
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water for the project will be sourced through tanker supply, and the Affidavit-cum-NOC for the same is enclosed as Annexure VIII .
26	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.	Not applicable, as there is no requirement for water in the mining process.
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.	No impact is anticipated, as mining is restricted to 2m below ground level or above the water table and is carried out only during the non-monsoon season. Water pollution control measures are detailed in Chapter 4 .
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken, and Report furnished. The Report inter-alia shall include details of the aquifers present and the impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and	The mining shall be carried out up to the depth of 2 meters in dry season & shall not intersect the ground water.

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	for pumping of ground water should also be obtained and copy furnished.	
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification/diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	Not Applicable.
30	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.	Elevation and depth details in Chapters 2 & 4; schematic diagram in approved mine plan Annexure-V .
31	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	Afforestation will be carried out on the proponent's land situated outside the riverbed, with the proposed species detailed in Chapter 2 .

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	submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. A phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for the 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.	The List of species to be planted is also provided in Chapter -2 .
32	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 the State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Traffic study is incorporated in Chapter-3
33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.	A temporary rest shelter equipped with drinking water, first aid facilities, and protective gear is proposed, with details provided in Chapter 2.

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34	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.	Proposed project is riverbed mining, the excavation carried out in an area in the particular year gets replenished during the subsequent year.
35	The 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.	Occupational health impact is mainly expected from air pollution due to fugitive dust emission because of movement of vehicles. However, appropriate mitigation measures for air pollution control have been proposed and detailed in the Chapter-7 Financial provision has been incorporated in Chapter-10 i.e., EMP in terms of capital cost & recurring cost.
36	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.	It is proposed to organize periodical health checkups for laborers detailed in Chapter 7 . Financial provision has been incorporated in Chapter-10 i.e., EMP in terms of capital cost & recurring cost
37	Measures of socio-economic significance and influence on 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.	Details of the social economic scenario of the study area is provided in of Chapter-3
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.	Comprehensive details are presented in Chapter 10 of this report

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39	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.	The proposed project is prepared for conduction of Public Hearing. Budgetary provisions will be incorporated in the EIA/EMP report after incorporation of public hearing proceedings.
40	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 the project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The total project cost is estimated at ₹15 lakhs. The expenditure for implementing the Environmental Management Plan (EMP) includes a capital cost of ₹6.19 lakhs. In addition, there is a recurring annual cost of ₹3.69 lakhs. Over a period of five years, the recurring expenses amount to ₹14.01 lakhs.
42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	Disaster management Plan given in Chapter-7
43	The 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.	Benefits of the Project given in Chapter-8
44	General Points	
a)	All documents to be properly referenced with index and continuous page numbering.	All documents are properly referenced with indexed and continuous page numbering.
b)	Where data are presented in the Report, especially in Tables, the period in which the data were collected, and the sources should be indicated.	Data sources and collection periods are indicated where applicable.

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c)	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.	Monitoring conducted by Noida Testing Laboratory, accredited by NABL and MoEF&CC.
d)	Where the documents provided are in a language other than English, an English translation should be provided.	Translated copies are provided wherever required.
e)	The questionnaire for environmental appraisal of mining project was devised earlier by the Ministry. shall also be filled and submitted.	All required documents, as per SEIAAHP guidelines, have been submitted.
f)	While preparing the EIA report, the instructions for the proponents and instruction 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.	EIA report prepared in accordance with the prescribed guidelines.
g)	Changes if any made in the basic scope and project parameters (as submitted in Form-1 and the PFR) for securing the TOR should be brought to the attention of MOEF&CC with reason for such changes and permission should be sought as the TOR may also have to be altered. Post public hearing changes in structure and content of the draft EIA/EMP (other than modification arising out of the P.H. process) will entail conducting the PH again with the revised. Documentation.	No changes made to the original scope or project parameters.

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<p>h)</p>	<p>As per the circular no. J-11011/618/2010-IA-II(I) dated 30.05.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operation of the project, should be obtained from the regional office of Ministry of Environment, Forest and Climate Change as may be applicable.</p> <p>I. The EIA report should also include.</p> <p>II. Surface plan of the area indicating contours of main topographic features, drainage and mining area.</p> <p>III. Geological maps and sections and sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.</p>	<p>Not applicable; this is a new project. Surface plan, contour details, drainage, and geological maps are enclosed.</p>
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In addition to the standard Terms of Reference (ToR) prescribed by the MoEF&CC, the following Specific ToR points have been stipulated by SEAC:-

Sr. No	Terms of Reference	Cross Ref. in EIA Report
<p>1</p>	<p>The project proponent shall include the detailed analysis of GLC-2.5 with air modeling and shall prepare the wind-rose diagram of the site to plan the installation of PCDs.</p>	<p>Analysis GLC 2.5 analysis along with Air Quality modelling and windrose diagram has been incorporated in Chapter 4 of Draft EIA Report.</p>

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2	The project proponent shall submit affidavit to ensure that after ceasing mining operation undertake regressing the mining area and any other area which may have been disturbed due to their mining activities and restore the land to a condition which is fit for growth of fodder, flora, fauna etc.	Not applicable;- As this is a riverbed mining project, plantation within the mined-out area is not feasible due to the nature of the terrain. Plantation activities will be undertaken outside the mining lease area, specifically on land owned by the project proponent.
3	The project proponent shall conduct and submit a comprehensive mineral replenishment study to assess the rate and extent of natural replenishment of minerals in the leased area.	The District Survey Report (DSR) of the concerned district has been attached as Annexure-XII , providing details of mineral availability in the mine lease area and the extent of natural replenishment within the Swan River.
4	The project proponent shall submit a certificate from the Director (Industries) to the fact that the proposed mining site is recommended/approved on the basis of the District Survey Report prepared & approved by SEIAA authorities in conformity with the SO No. 141 (E), SO, No. 3611(E) and as per Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020 published by MoEF&CC, GoI.	A Letter of Intent (LoI) has already been issued by the Department of Industries to the project proponent, and the mine plan has been approved as per the DSR approved by SEIAA, in line with the Sustainable Sand Mining Management Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020 published by MoEF&CC, GoI.
5	Hard copy of the application along with the relevant document shall be ink signed & submitted in the office of SEIAA Secretariat.	Agreed and will be complied.
6	The project proponent shall submit compliance report to the issue raised during public hearing.	Not applicable, as the draft EIA is being submitted for public hearing
7	The project proponent shall submit proposed EMP and including CER activities as its part. All the commitment made under EMP & CER shall be made in the form of affidavit.	CER has been included in the EMP. Commitments under EMP & CER will be submitted in affidavit form during the Final EIA presentation.

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8	The project proponent must ensure that environmental samples are analyzed at laboratories located in close proximity to the project site to maintain the accuracy and integrity of results. During each sampling activity, videography and geo-tagged photographs must be captured to provide transparent evidence of proper sampling locations, methods, and handling practices.	Agreed; will be complied. Environmental samples will be analyzed at accredited laboratories, and documentation including videography and geo-tagged photographs will be maintained as evidence.
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1 INTRODUCTION

1.1 1.1 PURPOSE OF THE REPORT

The purpose of EIA study is to assess the beneficial and adverse impacts of the proposed stone, boulder, bajri & sand mining project on the existing environmental parameters, so that suitable control measures could be taken to reduce impacts. Thus, the EIA report is a summarized presentation of base line information of air, water, soil, noise, flora, fauna, socio-economic study, and the prevailing environmental scenario of the project activity and the likely impacts due to proposed project, to decide the suitable mitigation measures for implementation to maintain healthy working environment and pollution content within permissible limits.

The Ministry of Environment, Forest, and Climate Change (MoEF&CC) through its EIA notification number SO1533 (E) of 14th September 2006 and its subsequent amendment under the Environment Protection Act, 1986, classifies this project under Category- “B1” due to its cluster situation.

Although the individual lease of the proposed project is 2.0569 hectare, which is less than 5 Hectare. The Mining Officer’s letter confirms the presence of two additional mining leases within a 500-meter radius of the site. This results in a combined cluster area of 7.6981 hectares, thereby necessitating appraisal under Category ‘B1’. Details of mine leases located within a 500-meter periphery are presented below in **Table 1-1**.

TABLE 1-1: DETAIL OF MINE LEASES WITHIN 500 METERS

Sr. No	Name of mine lease	Area in Hectare	Khasra No.	Status of Mining Leases
1.	M/s Ganpati Stone Crusher VPO Ole, Tehsil Ghanari, District Una. H.P	03.5511 Hect.	1981/2, 1985, 1986, 1995, 1996 & 1997	Operational
2.	M/s Rama Stone Crusher VPO Upper Andora, Tehsil Amb, District Una H.P	02.0901 Hect.	2549, 2552, 2551, 2552, 2553, 2554, 2555, 2556, 2542 & 2541	Operational
3.	Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher	02.0569 Hect.	2873, 2880/1, 2881/1 & 2882	Proposed
Total Area = 7.6981 hectare				

Environmental Management plays a vital role in the sustainable development of the country. Recognizing its importance, the Ministry of Environment, Forest & Climate Change, and Government of India has formulated policies and procedures governing the industrial and other developmental activities to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concern in project development.

The major objectives of the report are:-

- To establish the present environmental scenario,
- To anticipate the impact of proposed project and
- To suggest preventive and mitigation measures

The proposed riverbed mining of sand, stone, and bajri from the Swan River covers an area of 2.0569 hectares. The Terms of Reference (ToR) for the proposed project were approved in the 77th SEIAA meeting held on 25th February 2026. The ToR was subsequently issued under Identification No. TO25B0107HP5529278N, dated 11th March 2026, and is attached as **Annexure-III**.

This is a new project. No forest lands is involved. Method of mining is opencast, manual without drilling and blasting and restricted up to 2m depth. Mineral transportation will be done through road. M/s Aadhya Stone Crusher, linked to the proposed mine, is located at a distance of approximately 1.0 km.

Environmental Baseline monitoring data has been taken from January to March 2026.

1.2 IDENTIFICATION OF THE PROJECT

The proposed riverbed mining project involves the extraction of sand, stone, and bajri from the Swan River by Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher. The project covers an area of 2.0569 hectares, located at Khasra Nos. 2873, 2880/1, 2881/1, and 2882 in Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh.

The Letter of Intent has been sanctioned in favour of Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher. This letter was issued by the Department of Industries, Himachal Pradesh, under reference No. Udyog-Bhu(Khani-4) Laghu-597/2025-4675 dated 24.07.2025. Letter of Intent is attached as Annexure II & joint Inspection Report along with Tatima & Jamabandi attached as **Annexure IV**).

The Mining Plan has been approved vide letter no. Udyog-Bhu (Khani-4) Laghu-597/2025-7419 issued on dated 13.10.2025 is attached as **Annexure-V**.

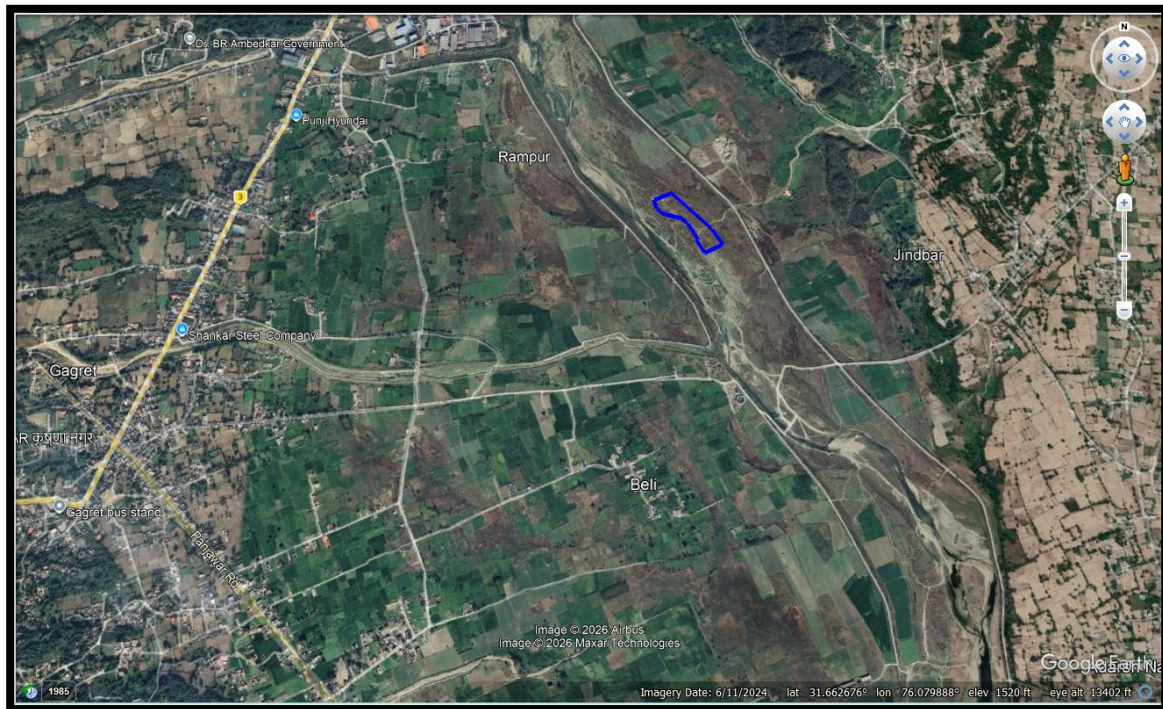


FIGURE 1-1: LOCATION OF THE PROJECT

1.3 PROJECT PROPONENT

M/s Aadhya Stone Crusher is driven by a team of committed and forward-thinking promoters with a vision to implement sustainable and regulated mining practices, while contributing to environmental conservation and regional.

The company has been actively involved in mining and allied activities since 2015 and is managed by highly trained and experienced professionals in the field of mining and resource management.

The key management personnel are as follows:- Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher.

The owner possesses in-depth knowledge of Riverbed mining operations and regulatory frameworks and are fully capable of managing and executing the project in an efficient, environmentally responsible, and legally compliant manner.

1.4 BIEF DISCRIPTION OF THE PROJECT

The proposed Sand, Stone, and Bajri mining project is located in Khasra Nos. 2873, 2880/1, 2881/1 and 2882 located at Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh. Covers a mining lease area of 2.0569 hectares of Riverbed, the project has been sanctioned in Favor of Sh. Raghav Thakur, Proprietor of M/s Aadhya Shankar Stone Crusher.,

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vide letter dated 24.07.2025. The project is aimed to extract 67500 TPA (including Waste) of minerals, with an estimated project cost of Rs. 10 lakhs.

The Mining Plan was approved on 13th October 2025, vide letter no. Udyog-Bhu (Khani-4) Laghu-597/2025/7419. There are no litigations or court cases pending against the project.

TABLE 1-2: SALIENT FEATURE OF THE PROJECT

Project Name	Riverbed Mining Project for the Extraction of Sand, Stone, and Bajri from Swan River, proposed by Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher
Mining Lease Area	2.0569 Hectare
Location of mine	Khasra No. 2873, 2880/1, 2881/1 and 2882, Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh.
Latitude	31° 40' 10.57" N to 31° 39' 56.98" N
Longitude	76° 4' 50.77" E to 76° 5' 4.61"E
Toposheet number	H43E2
Minerals of mine	Sand, Stone and Bajri
Proposed production of mine	67500 TPA (including Waste)
Method of mining	Semi mechanized
No of working days	270 days
Cost of the Project	10 lacs
Water demand	0.67 (Domestic) + 0.72 (Dust Suppression) =1.39KLD
Sources of water	Water will be supplied from Tube well through tanker supplier located near project site.
Manpower	15
Waste Generation	6750 TPA of mine waste in the form of Silty and Clay will be mined.
Nearest railway station	Amb Andaura Railway Station is about 2.45 km in the East direction (Aerial Distance) from the project site.

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Nearest state highway/national highway	National Highway-503 (Mubarakpur-Kiratpur Road) is about 3.22 km in East direction (Aerial Distance) from the project site. National Highway-70 (Jalandhar-Hoshiarpur-Mandi Rd) is about 1.90 km in West Direction (Aerial Distance) from the project site. Panjawar Road is about 2.12 km in SW direction (Aerial Distance) from the project site. Old Amb Road is about 0.55 km in South direction (Aerial Distance) from the project site.
Nearest airport	Jalandhar Airport is about 40.85 km in SW Direction (Aerial Distance) from the project site.
Seismic zone	Seismic zone -IV

1.4.1 Nature of the project:-

The proposed project involves mining sand, stone, and bajri from a Riverbed lease area, following the guidelines of the Ministry of Environment, Forest and Climate Change (MoEF&CC) and the Himachal Pradesh State Government.

It is classified as a B1 category minor mineral activity under the EIA Notification, 2006 and its amendments. The mining lease area covers 2.0569 hectares and is located in Khasra No. 2873, 2880/1, 2881/1 and 2882, Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh.

The site forms a cluster with three other mining leases within a 500-meter radius. Mining will be carried out using scientific and eco-friendly methods to minimize environmental impact and comply with all regulations.

Materials extracted will be used for construction activities like buildings, roads, and infrastructure development. The project is proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher, to meet the growing demand for construction aggregates in the region while maintaining environmental and safety standards.

1.4.2 Importance of project to Country and Region:-

The Riverbed mining project is important for providing sand, stone, and bajri key materials used in construction. It supports both local and national development by creating jobs, generating revenue, and helping build roads, bridges, and buildings. By following proper guidelines, the project also helps prevent illegal mining and promotes environmental care, making it vital for sustainable growth in the region.



1.5 SCOPE OF THE STUDY

Based on the information contained in the documents submitted and the presentation made before the State Environment Impact Assessment Authority (SEIAA) during its meeting on 25/02/2026, the Terms of Reference (TOR) were issued on 11/03/2026, subject to specific and general conditions. ToR and its compliance have been already given above.

1.5.1 Objective of the project

- Identify safe riverbed mining zones in accordance with the approved mine plan, avoiding areas prone to flooding, erosion, or near infrastructure like roads and bridges.
- Adopt eco-friendly and scientific mining practices to extract sand, stone, and bajri in a sustainable manner ensuring that ecological balance of the riverbank remain undisturbed.
- Monitor the quantity and quality of extracted minerals to prevent overexploitation and maintain resource balance.
- Comply with all environmental regulations and guidelines issued by central and state authorities.
- Implement safety measures such as retaining walls, drainage systems, and vegetation cover wherever feasible to protect the riverbanks and surrounding habitat.
- Provide training to workers on safety, health, and environmental conservation specific to Riverbed conditions.
- Collaborate with local communities and authorities to ensure socially responsible riverbed mining operations.
- Submit regular updates and reports to authorities regarding mining progress and environmental safeguards.

1.5.2 Methodology

Based on a preliminary assessment of the environmental conditions at the Riverbed Mining site and its surrounding areas, the central portion of the mining site has been designated as the core zone. This is the area most directly affected by mining operations, where fugitive emissions and other disturbances may significantly impact the nearby physical and biological environment.

A surrounding area within a 10-kilometer radius has been identified as the buffer zone. In this zone, environmental impacts are expected to be minimal and occasional, primarily influenced by indirect or secondary effects of mining activities.

Environmental baseline monitoring for air, water, soil, and noise was conducted during the period of January to March 2026. The baseline data was generated by Noida Testing Laboratories, a NABL-accredited facility.

A comprehensive study was undertaken by the EIA team, led by an accredited EIA

Coordinator and supported by approved Functional Area Experts. The team conducted detailed investigations covering all relevant environmental components, ensuring that the assessment reflects the site-specific characteristics and potential impacts of the proposed mining activity.

Work Programme:- The disciplines covered under the work programme are pre-requisite information of the site, impacts and management plans. The above disciplines include the following method of collection & compilation of data and the resulting predictions.

i) Preparation of a checklist including the details of type and class of information required for preparing an environmental impact assessment report. Major environmental aspects (i.e., testing etc.) covered under the study area.

- a) Selection of the appropriate sampling stations for Soil, Water & Air within Core and Buffer zone of 10 km radius.
- b) Various offices of villages-Panchayat and Tehsils within the study area were approached for their socio-economic status, standards of living, and possible impacts on their status by the proposed mining activity.
- c) The concerned meteorological department was contacted for the meteorological data like Rainfall, Wind, Temperature and Humidity.
- d) The data was then compiled, and results were interpreted in the form of Graphs, Figures, Tabulations, and Illustrations.
- e) The impacts were predicted on the basis of baseline environmental data highlighting the positive & negative impact on account of proposed mining activities.
- f) Environmental Management Plan is prepared for mining project, suggesting various mitigation measures to reduce/eliminate adverse impacts of the riverbed mining and other aspects as may be required by the concerned authorities.

1.5.2.1 Establishment of Baseline Environmental Status

A comprehensive database detailing the baseline environmental conditions of the study area has been developed through the following approaches:-

Review and analysis of existing secondary data, including published literature, reports, and other relevant information sources.

Collection of primary data through initial site reconnaissance, field surveys, and environmental monitoring conducted specifically for this study.

1.5.2.2 Environmental Impact Assessment

The proposed project activities have been systematically analyzed in relation to the established baseline environmental conditions. This analysis identifies the environmental

parameters likely to be affected and evaluates the potential impacts on each. Furthermore, the project's compliance with applicable national environmental standards and regulatory requirements has been thoroughly reviewed to ensure adherence to statutory norms.

1.5.2.3 Preparation of Environment Management Plan

The Environmental Management Plan (EMP) serves as a critical framework to ensure environmentally responsible and sustainable mining operations. Effective implementation of mitigation measures depends on a well-structured EMP that outlines strategies to minimize adverse environmental impacts arising from riverbed mining activities.

The EMP for the proposed Riverbed Mining project has been developed to address the following key components:-

- Detailed management strategies for environmental protection during all phases of the project.
- Pollution control and mitigation measures aimed at reducing negative impacts during both the operational and post-operational phases.
- Protection and maintenance of water resources and water quality, especially considering the ecological sensitivity of riverine systems.
- Post-project environmental monitoring programme to track the effectiveness of mitigation measures and ensure ongoing compliance.

The study area encompasses a 10-kilometer radius around the proposed mining site. Baseline environmental quality was assessed using primary data collected between Jan 2026 and March 2026 and supplemented with secondary data from credible sources.

1.5.2.4 Structure of Eia Report

The generic structure of the report is given below:

Chapter 1: Introduction

Chapter 2: Project Description

Chapter 3: Description of the Environment

Chapter 4: Anticipated Environmental Impacts and Mitigation Measures

Chapter 5: Analysis of Alternatives (Technology & Site)

Chapter 6: Environmental Monitoring Program

Chapter 7: Additional Studies

Chapter 8: Project Benefits

Chapter 9: Environmental Cost Benefit Analysis

Chapter 10: Environmental Management Plan

Chapter 11: Summary and Conclusion

Chapter 12: Disclosure of Consultant Engaged

1.6 STATUS OF LITIGATION

There are no litigation/ court cases pending against the project as on date.

1.7 REGULATORY REQUIREMENT

The following rules and guidelines are applicable for the selection of site, establishment of mining operations, design of the facility, and environmental monitoring for riverbed mining projects:-

- ❖ Environmental Impact Assessment Notification S.O. 1533 (E) dated 14th September 2006, along with its subsequent amendments, governs the requirement for prior environmental clearance for mining activities.
- ❖ Mineral Conservation and Development Rules (MCDR), 2017, as amended, provide detailed provisions for sustainable mining practices, including environmental safeguards and reporting obligations.
- ❖ Guidelines for Preparation of Mining Plan and Mine Closure Plan (2025) issued by the Ministry of Coal, which emphasize restoration, remediation, and post-mining monitoring 2.
- ❖ Consent to Establish and Operate under the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974, as mandated by the respective State Pollution Control Board.
- ❖ Forest (Conservation) Act, 1980, if the mining site involves forest land.
- ❖ The Himachal Pradesh Minor Mineral (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, which regulate riverbed mining activities within the state.

1.7.1 Guidance Applicable for Riverbed Mining by CPCB

i) Categorization of Riverbed Mining Activities

CPCB classifies riverbed mining (excluding manual excavation) under the red and orange categories depending on the scale and clustering of operations:-

Red Category:- Mining lease area >5 hectares or part of cluster mining.

Orange Category:- Standalone mining lease area ≤5 hectares not part of any cluster

ii) Environmental Concerns Highlighted

CPCB emphasizes that riverbed mining can lead to:-

- Ecological disturbances
- Erosion of riverbeds
- Alteration of hydro-geological conditions
- Disruption of river ecosystems

iii) Cluster Mining Definition

Mining leases within 500 meters of each other are considered part of a cluster, which requires cumulative impact assessment and stricter monitoring.

iv) Enforcement & Monitoring Guidelines for Sand Mining (2020)

These guidelines, adopted by CPCB and MoEF&CC, mandate:-

- Manual extraction methods in sensitive zones
- Restrictions on use of heavy machinery
- Compliance with District Survey Reports (DSRs)
- Seasonal bans during monsoon months (June to September in Himachal Pradesh).

v) District Survey Reports (DSRs)

District Survey Reports (DSRs) are mandated to ensure that each district documents its mineral resources, identifies sensitive ecological zones, and sets out sustainable mining and monitoring practices for responsible environmental management.

1.7.2 Relevant Provision of Riverbed Mining Rules

- Himachal Pradesh Minor Minerals (Concession) and Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2015 (Amended 2024)
- Himachal Pradesh Mineral Policy, 2024
- Forest (Conservation) Act, 1980
- District Mineral Foundation (DMF) Rules, 2025

2 PROJECT DESCRIPTION

2.1 GENERAL

The proposed project is a Riverbed mining project for extraction of Sand, Stone and Bajri from Swan River situated at Khasra No. 2873, 2880/1, 2881/1 and 2882, in Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh. having lease area of 2.0569 ha. The lease has been sanctioned in favour of Sh. Raman Kapur, Proprietor of M/s Jai Shankar Stone Crusher vide letter no. Udyog-Bhu (Khani-4) Laghu- 597/2025-4675 Dated 24.07.2025. Copy of LOI is attached as **ANNEXURE-II**.

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereafter, the proposed mining project is categorized as category 'B1' project. As per the mining officers letter stating that there are two another mine lease exist within the periphery of 500 meters from the project site. Resulting the total area of all mines are 7.6991 ha. The proposed mining activity will be carried out from Riverbed. It has been proposed to collect 67500 MTPA Sand, Stone & Bajri. Max. 6750 TPA of mine waste in the form Silt and Clay will be generated as a waste. As per the approved mine plan vide letter no. Udyog-Bhu (Khani-4) Laghu-597/2025-7419 issued on dated 13.10.2025 attached as **ANNEXURE-V**.

The lease area is situated in the Riverbed. The height elevation point of the mining lease area is 461 Meters above MSL and the lowest point is 460 meters above MSL The proposed activity is to take place on the Riverbed and hence there will be a temporary change in land use. The mining lease is a private land in the form of riverbed and is scarce of any kind of vegetation except small bushes and plants. After Ceasing mining operation, the site will be rehabilitated through tree plantation.

2.2 SITE HISTORY

The Joint Inspection Committee has identified the riverbed site as suitable for mining due to natural sediment deposits. Environmental assessments confirm the area is free from erosion-prone zones and sensitive infrastructure. Resources such as sand, stone, and bajri have been evaluated for sustainable extraction, with operations to be carried out under depth limits and in compliance with the EIA Notification 2006 and Sand Mining Guidelines 2016. Strengthened regulatory measures by the Himachal Pradesh Government ensure mining is conducted responsibly and sustainably.

2.3 TYPE OF PROJECT

The proposed activity is a Riverbed Mining Project for the extraction of minor minerals such as sand, stone, and bajri from Swan River situated at Khasra No. 2873, 2880/1, 2881/1 and

2882, Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh. The project falls under Category 'B1' as per the EIA Notification, 2006 and its subsequent amendments. Although the individual mining lease area is 2.0569 hectares, it forms part of a cluster as defined under the MoEF & CC guidelines, with two other mining leases located within a 500-meter radius. The total cluster area of 7.6991 hectares requires an Environmental Impact Assessment (EIA) and appraisal by the State Expert Appraisal Committee (SEAC).

The proposed mineral extraction will be carried out using manual methods, without the use of drilling or blasting techniques, thereby ensuring minimal disturbance to the environment.

2.4 NEED FOR THE PROJECT

The mining activities as proposed are the backbone of all construction and infrastructure projects as the raw material for construction is made available only from such mining. The sand, stone and bajri extraction are in high demand at the local market for real estate and infrastructure industry. Project will also provide employment to local people. Some environmental benefits of the project are as follows:-

- ✓ Channelization of River
- ✓ Controlled excavation and Erosion Control
- ✓ Enhanced Surface Runoff Management
- ✓ Protection of Agricultural Land
- ✓ Reduction in Illegal Mining Activities
- ✓ Eco-Friendly Dust and Noise Mitigation
- ✓ Reclamation and Afforestation Opportunities

To meet the growing demand for materials in the region, the project will supplement the limited supply from government-leased mining areas, thereby supporting legal and sustainable mining practices.

2.5 LOCATION OF THE PROJECT

The mining lease area is situated in Khasra No. 2873, 2880/1, 2881/1 and 2882 at Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh, covering a total area of 2.0569 hectares, as delineated in Topographical Sheets No. H43E2. **Figure 2.1** presents the buffer map highlighting key features within a 10 km radius of the mining lease area. **Figure 2.2** illustrates the pillar coordinates delineating the boundaries of the lease site. According to the revenue records provided in the table below.

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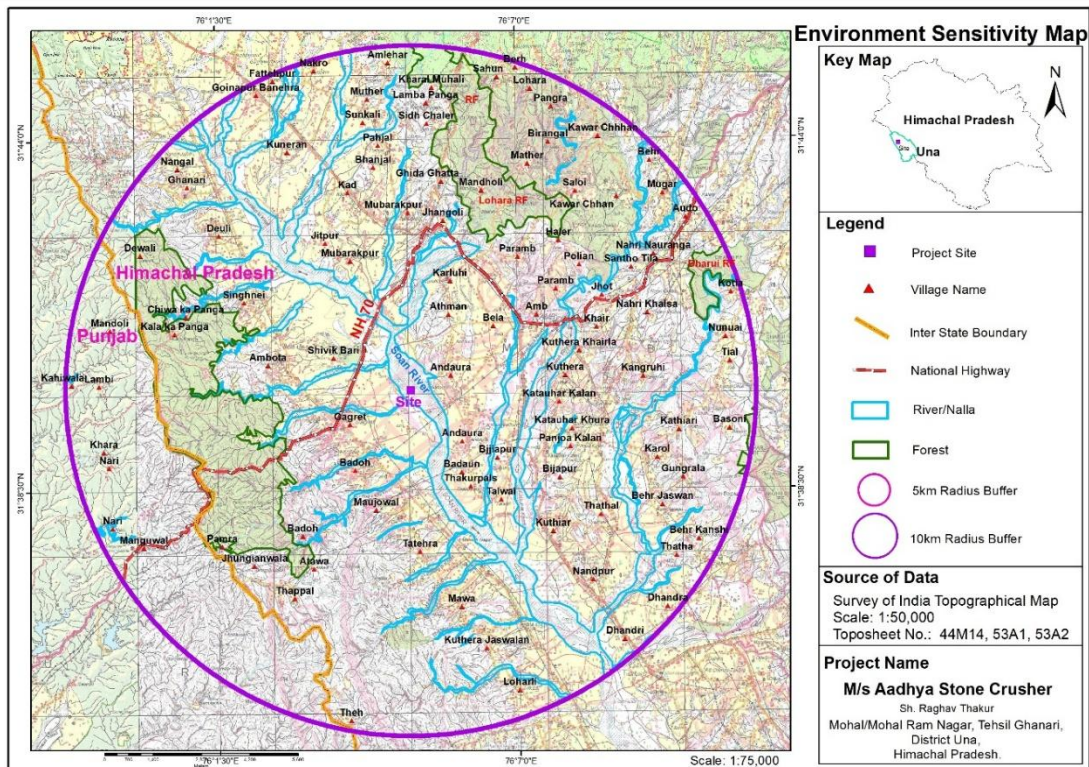


FIGURE 2-1 ENVIRONMENT SENSITIVITY MAP HIGHLIGHTING KEY FEATURES WITHIN 10 KM



FIGURE 2-2 PILLAR CO-ORDINATE SHOWING PROJECT LOCATION



FIGURE 2-3 SITE PHOTOGRAPHS

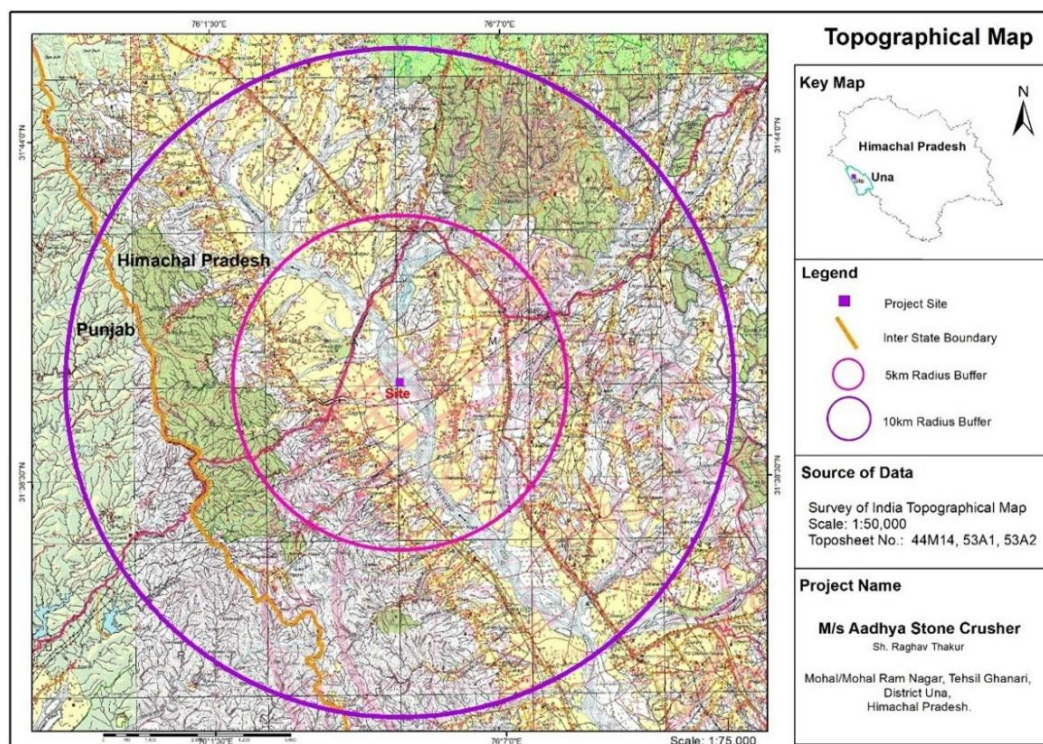


FIGURE 2-4:- TOPO MAP SHOWING 5 KM & 10 KM BUFFER FROM THE PROJECT SITE

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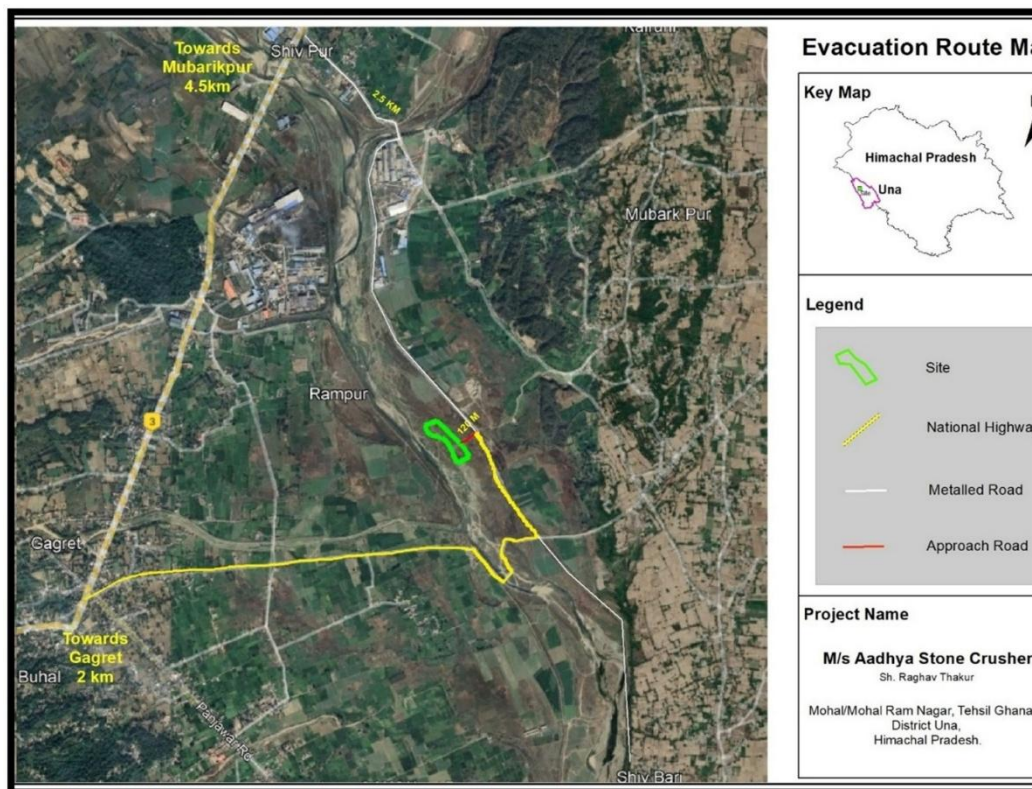


FIGURE 2-5 EVACUATION ROUTE MAP

Details of the area covered under the mining lease, as specified in the approved mine plan.

Sr. No.	Khasra Number	Area in Hectare	Owner of Land	Kisam	Mauza /Mohal	Name of Panchayat
1	2873, 2880/1, 2881/1 and 2882	2.0569 Hectares	Private Land	Gair Mumkin Khad	Ram Nagar	Ghanari Upper

**Source: Approved Mine Plan*

2.6 SIZE AND MAGNITUDE OF OPERATION

The proposed Riverbed mining project by Sh. Raghav Thakur, Prop. of M/s Aadhya Stone Crusher is located Khasra Nos. 2873, 2880/1, 2881/1 and 2882, covering a total area of 2.0569 hectares of private land. The site falls within Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh. Due to the presence of two other mine leases within 500

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meters, the project forms a cluster of 7.6991 hectares falling Category 'B1' project under EIA Notification, 2006. The project aims to extract 67500 TPA of sand, stone, and bajri using manual methods, without drilling or blasting. Max. 6750 TPA of mine waste, in the form of Silt and Clay, will also be collected.

2.7 PROPOSED SCHEDULE FOR APPROVAL & IMPLEMENTATION

The implementation of the proposed riverbed mining project is expected to follow the schedule below, subject to timely approvals from regulatory authorities:-

S. No.	Activity	Estimated Time frame
1	Submission of EIA/EMP Report to SEIAA	Month 1
2	Public Consultation (if applicable)	Month 2-3
3	Appraisal and Grant of Environmental Clearance	Month 4-5
4	Grant of Mining Lease by State Government	Month 6
5	Site Preparation and Mobilization	Month 6-7
6	Commencement of Mining Operations	Month 7 onwards

2.8 TEHCNOLOGY AND PROCESS DISCRPTION

The project will employ manual methods of mining to extract sand, stone, and bajri from the swan riverbed. No drilling or blasting will be involved. Simple tools such as shovels and similar equipment will be utilized for collection and transportation, ensuring minimal environmental disturbance and adherence to sustainable practices. Mining activities will be restricted to non-monsoon periods, ensuring compliance with environmental safeguards and minimizing risks associated with high river flows. All activities will follow the Sustainable Sand Mining Guidelines, 2016 and Himachal Pradesh Mineral Policy to ensure environmental compliance.



2.9 ASSESSMENT OF NEW & UNTESTED TECHNOLOGY FOR THE RISK OF TECHNOLOGY FAILURE

The adoption of new and untested technology in Riverbed mining requires careful scrutiny due to Himachal Pradesh's fragile terrain and ecological sensitivity. Operational reliability, environmental compatibility, and safety under local conditions must be prioritized to prevent risks such as soil erosion, slope destabilization, and hydrological imbalance. Pilot-scale trials and continuous monitoring are essential to validate performance before full-scale deployment. Robust contingency measures should be in place to address unforeseen failures swiftly. A phased and cautious approach ensures that mining activities remain sustainable. Ultimately, responsible technology assessment will help balance resource extraction with the preservation of the region's delicate mountain ecosystems.

2.10 GENERATION OF MINE WASTE AND ITS DISPOSAL

6750 TPA of Silt/Clay will be generated as waste during mining operation. As per the approved mine plan, waste will be dumped at a lease-holder-designated site near the stone crusher and later reused for road construction and maintenance (road filling, etc.), while clay will be used for plantation activities.

2.11 GEOLOGY

2.11.1 Local Geology

The study of rocks in and around the applied area shows that these are formations of Middle Siwalik. The Geological Survey of India has carried out a systematic mapping of the area and as per the Geological map prepared by the said agency, the rocks mainly belong to pre-Cambrian to the Siwalik group, terrace deposits and channel deposits. The proposed area is situated in the riverbed of the Swan covered with boulders, cobbles, pebbles, river-borne bajri, sand and clay deposits. The rocks along the banks are forming terrace deposits comprising boulders, cobbles, pebbles, river-borne bajri, sand and clay deposits.

The lease area forms a part of the stream bed covered with boulders cobble pebbles. river-born bajri sand and minor silt/clay deposits of channel alluvium. The rocks along the banks are Terrace alluvium and Fan Alluvium and in the higher reaches of catchments is Middle Siwalik Formation. The boulders, cobbles and pebbles are hard in nature and suitable sand deposits are available. The river-borne material also consists of clay and silt which is non-separable. The area is flat and is occupied with silt/clay which is formed due to weathering of upper hill slopes. The thickness of this river-borne material is at least 3.0mts as gathered in discussion with P.W.D. authorities as they have noticed in the past while digging for bridge abutments as well as from the IPH department while digging bore wells.

2.11.2 Geology of the Una District

Himachal Pradesh can be broadly divided into two major geo-tectonic zones viz. the lesser

Himalayan tectogen in the south and the Tethys Himalayan Tectogen in the north. These two tectonic breaks are collectively designated as the main Central Thrust in the sense defined by Srikantia (1988). Mandi District lying with the lesser Himalaya and the Shiwalik Foothill comprises rocks ranging in age from Proterozoic to Quaternary. The oldest rocks are of undifferentiated Proterozoic age, comprising carbonaceous phyllite, schist, gneiss, quartzite and marble. The Ghoghar Dhar (undifferentiated Proterozoic age) occurs as an intrusive body within the Chail group of rock. This granite body is well-foliated and composed of gneisses, granite with minor aplite and basic veinlets. The Sundar Nagar group of rocks of the Meso Proterozoic age is represented by quartzite with basic flows. The Shali group of rocks (Meso Proterozoic) comprises limestone, dolomite (at places stromatolitic) slate and quartzite. The Subathu consists mainly of olive-green shales and grey shales. At the top, a band of white quartzite is exposed: this band of white quartzite has been taken as the marker, defining the top of the Subathu sequence. The thick sequence of brackish and freshwater sediments immediately succeeding the fossiliferous marine Subathu are classified as the Dharamshala formation. The Dharamshala formation is widely exposed in the Mandi parautochthon, further west in the autochthon, these rocks are exposed in the core of the Sarkaghat anticline. The Shiwalik group of the Middle Miocene of the Early Pleistocene age comprises coarse clastic fluvial deposits of sandstone, clay and conglomerates. The quaternary sediments (older Alluvium and new Alluvium) along prominent channels consisting of sand silt, clay, pebbles and cobbles occurring along present channels of Middle to late Pleistocene and Holocene age. The stratigraphical sequence in the catchment area is tabled as under:-

GROUP		LITHOLOGY	AGE
Newer Alluvium	<i>Chanel Alluvium</i>	<i>Boulders, cobbles, pebbles, Grey micaceous, fine to coarse-grained sand, silt and clay</i>	Quaternary
	<i>Terrace Alluvium</i>	<i>Cyclic sequence of Boulders, cobbles, pebbles, grey micaceous sand, silt and clay</i>	
	<i>Fan Alluvium</i>	<i>Brownish grey clay, sand and gravel with boulders</i>	
Older Alluvium	<i>Dun Gravels</i>	<i>Multicyclic sequence of brown to grey silt, clay with kankar and reddish brown to grey micaceous sand with pebbles</i>	
Siwalik Group	<i>Upper Siwalik</i>	<i>B. Predominantly massive conglomerate with red and orange clay as matrix and minor sandstone and earthy buff and brown claystone</i>	Neogene
		<i>A. Sandstone, clay and conglomerate alternation</i>	
	<i>Middle Siwalik</i>	<i>B. Massive Sandstone with minor conglomerate and local variegated claystone</i> <i>A. Predominantly medium to coarse-grained sandstone and red clay alternation, soft pebbly with subordinate claystone, locally thick prism of conglomerate</i>	
<i>Lower Siwalik</i>	<i>B. Alternation of fine to medium-grained sporadically pebbly sandstone, calcareous cement and prominent chocolate and medium maroon claystone in the middle part</i> <i>A. Red and mauve claystone with thin intercalations of medium to fine-grained sandstone</i>		

TABLE 2-1 STRATIGRAPHY OF THE AREA

Older Alluvium

The older Alluvium is composed of a multi-cyclic sequence of brown to grey silt, clay with kankar and reddish brown to grey micaceous sand with pebbles.

Newer Alluvium

The New Alluvium is composed of a terrace and Charnel alluvium of fine to coarse-grained greyish/brownish sand and grit with pebbles of sandstone/quartzite and fine to coarse, micaceous, sand with little silt and clay.

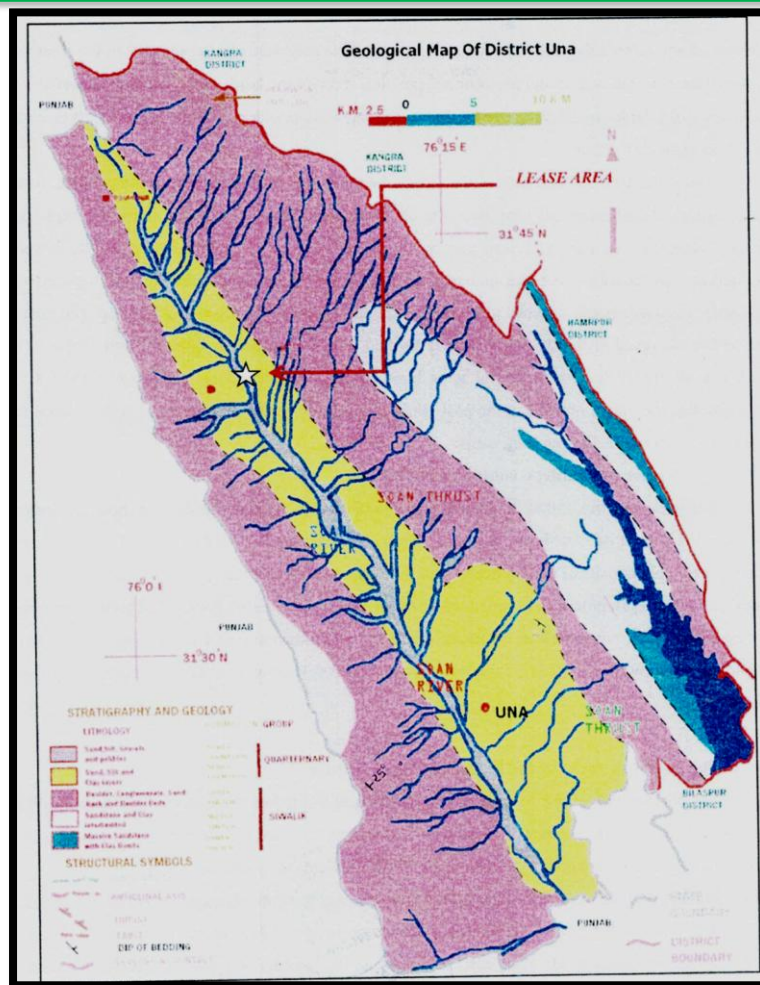


FIGURE 2-6:-GEOLOGICAL MAP OF UNA DISTRICT

***Source:-** Approved Mine plan

2.12 TECHNOLOGY AND PROCESS DESCRIPTION

The mining is confined to extraction of Sand, Stone and Bajri from the proposed mine site. The extracted minerals will be collected in their existing form and sent to the existing stone crusher for making desirable grit. The mining lease area is located on a Riverbed and suitable material is available in the whole of the mining lease area. Considering the suitability of the material, the open-cast mining method is proposed, with an excavation depth of up to 2 meters. The mined-out area undergoes natural replenishment each year during the monsoon. Since the mineral deposit is restored annually, the reserves remain renewable and will not be exhausted. Mining operations will be carried out through manual methods. No drilling or blasting activities will be undertaken.

The size or amount of production of material from the lease area will depend upon following factors:-

CONSIDERATIONS

- A Geological map was prepared (Scale 1:2000) and main Litho-units were marked on the plan to know the surface spread of each unit.
- The different constituents of river-borne deposits such as boulder, bajri, sand and silt /clay based on size classification were considered for reserve calculation. Although, it is not possible to mark these units separately on the geological map hence, three pits at different locations in and around the mining lease area of 1x1x1 meter were dug and the material so excavated was separated into different sizes and their percentage was worked out, and percentage was considered during the calculation of Reserves.
- The mining shall be undertaken manually, and mechanical mining may be undertaken if permitted by the competent authority.
- The area applied for the mining lease is situated in the middle of the Swan River and is restricted to a distance of 75 meters from the dam (embankment structure) constructed by the Flood Protection Department.
- As per Joint Inspection Committee's recommendations, a 5-meter buffer zone has been applied at the periphery of the lease boundary during reserve calculation to prevent over-exploitation or overlap with adjacent lands.
- For the purpose of this calculation. 15.000 sq. m shall be considered for mining after leaving a buffer zone of 2.00 meters from the mining lease boundary. The total available mineable area is 73% of the total mining lease area.
- Keeping in view the replenishment factor, the whole block shall be explored every year.
- The average specific gravity of the minor mineral has been taken as 2.25 for the calculation of reserves and two-meter depth is taken for the calculation of reserves.
- The Mineable reserves have been calculated as per the available reserves in the entire available mining lease area.
- The entire Mining lease area is situated within the Swan embankments and during heavy rains in the catchment area, the Swan River experiences heavy floods.

- The proposed mining lease area is measuring 2.0569 Hectare. It has been proposed to collect Maximum 67500 TPA of Sand, Stone & Bajri

(a) Replenishment

The average specific gravity of 2.25 has been considered for the reserve estimation. The mining operations will be carried out using open-cast methods with a maximum working depth of 2 meters. As per the approved mine plan, the permitted production capacity is approximately 67,500 TPA (including waste). During the mining process, around 6,750 TPA of mine waste primarily comprising silt and clay will be generated annually. The total lease area covers 2.0569 hectares.

2.13 PROJECT DESCRIPTION

The mining lease has been proposed by Sh. Raghav Thakur, Proprietor of M/s Aadhya Stone Crusher. The mining lease area is 2.0569 Hectare located Khasra 2873, 2880/1, 2881/1 and 2882, Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh. It has been proposed to collect approximately 67500 TPA of sand, stone & bajri including mine waste. 6750 TPA of mine waste in the form of Silt and clay will be generated. The baseline monitoring for months Jan-Mar'2026 has been done.

2.14 PRODUCTION PARAMETERS

The primary requirement of the project is the extraction of boulders to produce desirable grit. Accordingly, the lease holder proposes to mine mainly sand, stone, and bajri from the Riverbed. The material will be extracted by manually and crushed to the required size, while the remaining material sand and bajri will be directly send to the market as per requirement. Since the mining activity is carried out on a riverbed, the calculation of reserves is based on prevailing market technology and processing practices.

TABLE 2-2 PERCENTAGE OF MINERAL IN MINE LEASE AREA

Sr.No.	Minerals	Percentage in mine lease area(%)
1.	Stone/Boulders	30%
2.	Bajri	25%
3.	Sand	35%
4.	Silt	10%
Total Minerals		100 %

***Source: Approved Mine Plan**

The Mineral production target for the Next five years is given below.

TABLE 2-3 YEAR WISE PRODUCTION OF MATERIAL (IN MT)

Year	Stone/Boulder	Sand	Bajri	Mine waste (Silt & Clay)	Total
1st Year	20,250	23625	16875	6750	67500
2nd Year	20,250	23625	16875	6750	67500
3rd Year	20,250	23625	16875	6750	67500
4th Year	20,250	23625	16875	6750	67500
5th Year	20,250	23625	16875	6750	67500
Total	1,01,250	1,18,125	84,375	33,750	3,37,500

2.15 WORKING DEPTH (BELOW GROUND LEVEL)

The Mining will be carried out on the Swan Riverbed. During the lease period, extraction will proceed progressively, lowering the working depth by 2 meters.

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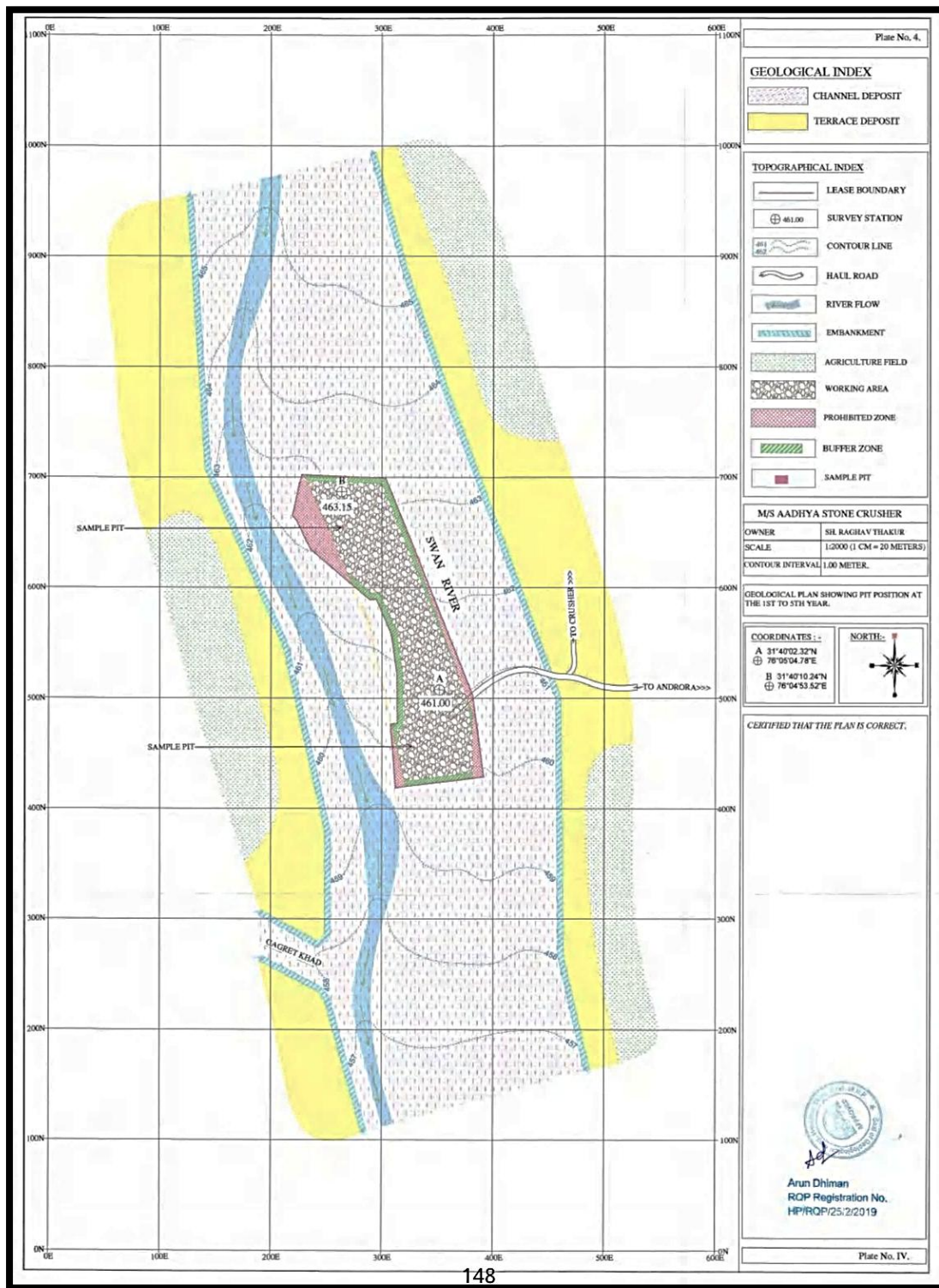


FIGURE 2-7: WORKING PLAN OF MINE LEASE AREA

2.16 QUANTITY OF WASTE TO BE GENERATED (LIQUID & SOLID) AND Its MANAGEMENT:-

No liquid effluent will be generated during this process. Max. 6750 TPA of mine waste in the form of Silt and Clay will be generated as waste during the mining process. As per approved mine plan, waste will be dumped at a designated by lease holder near the stone crusher site. This material will later be repurposed for road construction and maintain activities, such as road filling etc. and Clay will be utilized to plantation activities.

Municipal waste generation envisaged from the project is minimal i.e. 3.75 Kg/day as only 15 persons will be employed at site. Garbage bins for dry and wet waste will be provided in rest shelters. Biodegradable waste will be composted in compost pits. Other waste will be sent to crusher site from where it will be disposed to common disposal site of village. No waste will be disposed of the project site.

2.17 RECLAMATION AND RESTORATION

Erosion in the watershed affects the amount of sediment carried downstream, with slope length and gradient influencing sediment loss. In this khad, much of the sediment gets deposited as water velocity decreases, with annual deposition of about 3–5 cms. The river naturally replenishes the mined area during the monsoon season.

Key Points:-

- ❖ The mined riverbed area is naturally replenished every monsoon.
- ❖ The lease area remains a riverbed during and after mining.
- ❖ No permanent change occurs in the river's natural topography or land use.
- ❖ Five check dams/retaining walls will be built at vulnerable points to stabilize the area and prevent debris collapse as per the mining plan.

Plantation

As per the mining plan the entire mining lease area falls within the river course. The entire mining area falls within the river course and gets flooded during monsoons; therefore, no plantation is possible within this area. However, plantation shall be undertaken outside the riverbed area in his proponent's own land measuring area 1.0 Hectare as per consultation with panchayat.

Year Wise Survival Rate

Though the survival rate is about 70 percent in the area. However, after yearly review it will ensure that the plants will be looked after and in case of failure of some plants to survive, these will be promptly replaced. Thus, by the end of five years, the survival rate will be ensured to be at least 90 percent.

2.18 EMPLOYMENT GENERATION/ MANPOWER REQUIREMENT:

- The mining activity in the lease area will thus give direct employment to about 22 persons engaged in extraction of sand, stone & bajri: loading of material into tractor trolleys and tipper trucks.
- The sand, stone & bajri shall be transported to the market for open sale. Thus, for transportation of material about two staff, four drivers and thirty helpers shall be engaged.
- Project will also generate indirect employment for skilled and semi-skilled workers. Thus, the project helps in increasing the socio-economic status or livelihood of the nearby villagers.

TABLE 2-4: EMPLOYMENT DETAILED

Sr.No.	Category	Number
1.	Administrative	1
2.	Supervisory	1
3.	Drivers	3
4.	Mining workers	10
Total		15

2.19 TRANSPORTATION OF THE MINERALS

- The lease area is having gentle slope, hence, tracks for the movement of trucks and tractors can be made and maintained in any part of the lease area.
- The loaded tractor trolleys/trucks would carry the material to the market for captive stone crusher. The crusher site, at a distance of about 1.0 km from the mining site. About 243 metric tons of sand, stone and bajri would be required to be moved daily.

During mine operation traffic intensity

Total Production	: 65700 TPA (Including Waste)
No. of working days	: 270 Days
Per day capacity of mine	: 243 tonnes/day
Trolley/Truck capacity	: 9 tonnes
No. of trip deployed	: 27 trips/day
Working hours per days	: 8 hours
No. of trucks deployed/h	: Approx. 3 tractor trolley

2.20 POWER, WATER SUPPLY AND OTHER ONSITE REQUIREMENTS

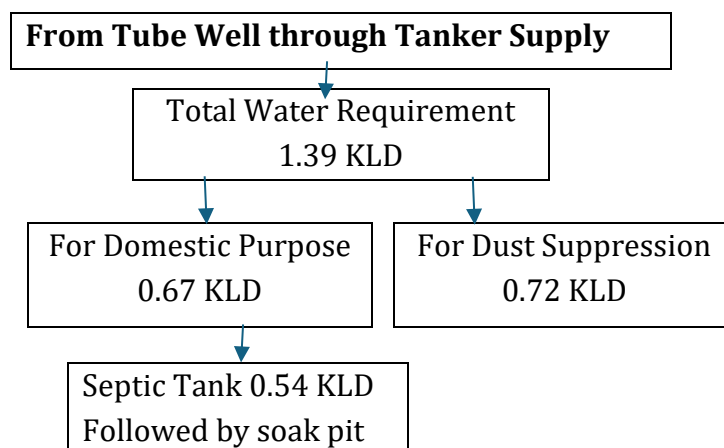
- No raw material will be required in the proposed project. The operation involves the extraction of sand, stone and bajri and in its existing form and loaded into tractor trolleys to the crusher site to make grit comprising of different sizes.
- Minor mineral namely sand, stone & bajri and is used as raw material for construction and infrastructure projects like building, bridges, dams etc.
- The transportation of sand, stone & bajri will be carried out by tractor trolleys to the Crusher site after making desirable grit then finished product will be transported to the market. The practice is quite sound in the area and ensures continuous lifting of the material.

- **POWER REQUIREMENT**

All the activities will be carried out manually. The operation will be done only daytime (9am to 6pm) hence there will be no power requirement at the project site.

- **WATER REQUIREMENT & SUPPLY**

The amount of water required for the project is 1.39 KLD. This Water will be supplied from Tube Well through Tanker supply for drinking purpose & dust suppression. Water balance diagram is shown. Water balance diagram is shown below:-



Water is required for drinking, domestic purposes and for dust suppression. The number of working people shall be 15 therefore water requirement will be 1.39 KLD. About 0.72 KLD will be required for dust suppression and 0.67 KLD for domestic purposes. Additional water per year will also be used for plantation purposes.

Temporary Rest Shelter

A temporary rest shelter will be provided for the workers near to the site for rest. In addition, first aid box along with anti-venoms to counteract poison produced by certain species of small insects, if any and Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

2.21 IMPACT OF MINING ACTIVITY & ITS CONTROL MEASURES

The impact on environment due to this mining operation is general:-

TABLE 2-5 DESCRIPTION OF ACTIVATES AND ANTICIPATED IMPACTS

Activities/issues of concern	Anticipated environmental impacts
Land alteration/regime modification. > Mobilization of labor > Mining of Riverbed extraction of (Sand/Stone & Bajri) > Acquired land area~ 2.0569 ha. Land use in conformation of Mine plan	> Undercutting and collapse of Riverbank > Riverbank cutting and erosion. > Existing ecology and habitat
Waste generation due to mining > Mine waste Silt and Clay	> Silty & clay increase the turbidity and total suspended solid
Mining of mineral & transportation > Machinery and equipment deployment > Haulage of mined out material to the Crusher site. > On-site storage and handling of material > Laying of utilities-roads, & water	> Pollution due to operation of equipment > Pollution due to fill up of extracted materials. > Silty/Clay management > Haulage of material and on-site vehicular movement > Waste generation due to on-site activity > Safety and health issues of workers
Human settlements > Temporary/permanent movement of population during operation phase > Transportation requirements of public/civic amenities > Waste generation due to mining (silty & Clay)	> Alteration in settlement patterns > Alteration in traffic movement and Socio- economic activities due to the proposed project. > Silty sand & Topsoil increase the turbidity & total suspended solid.

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

Waste generation due to mining Mine waste silt & clay	> <i>Silty and clay increase the turbidity & total suspended solid</i>
Health and safety	> <i>Health, safety, and welfare of workers during mining activity</i> > <i>Safety provision for existing and Activities</i> > <i>Probability and containment of natural hazards</i>

The detailed mitigation measures are suggested in **Chapter -4** of EIA report.

3 DESCRIPTION OF ENVIRONMENT

3.1 INTRODUCTION

The chapter contains information on the existing environmental status of land, air, water, biological & socio-economic environment. The mining activity will remain confined to a very small area and of little magnitude hence the zone of influence will be only surrounding fields of the leased-out area. To achieve these objectives, monitoring of the environmental parameters within the core zone and buffer zone has been undertaken in accordance with the terms of reference and guidelines for EIA issued by the Ministry of Environment & Forests, climate change Govt. of India.

Fresh environmental baseline monitoring has been conducted. Data on air, water, soil, and noise quality was systematically collected during the post-monsoon season (January–March 2026).

The baseline information was generated by Noida. Testing Laboratories, a NABL approved lab. In addition to primary monitoring, secondary information was obtained from published sources of government and semi-government organizations. The main objectives of environmental baseline study are:-

The main objectives of environmental baseline study are:-

- (i)** To assess present environmental quality for prediction of environmental impacts.
- (ii)** To identify environmentally significant factors for taking mitigating measures.

3.2 STUDY AREA AT GLANCE

The study area for proposed mine's baseline study covers the total area within 10km radius from the mine lease periphery. Further the study area has been divided into two zones namely, "Core Zone" and "Buffer Zone". The core zone comprises of the mine lease area within the mine lease boundary while the area outside the mine boundary is buffer zone.

A Map showing study area of the proposed project is given in figure. The specific location of the project is detailed below:-

- Mauza/Mohal Ram Nagar,
- Tehsil- Ghanari,
- District-Sirmour (Himachal Pradesh)

3.3 STUDY PERIOD

Baseline monitoring was conducted during the post-monsoon season, from January to March 2026.

3.4 COMPONENT OF THE STUDY

The component of the baseline data generated includes below:-

- **Meteorology:-** Temperature, Relative Humidity, Rainfall, Wind Speed & Direction.
- **Ambient Air Quality:-** Particulate matter <10-micron size (PM10), Particulate matter <2.5-micron size (PM2.5), Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂).
- **Ambient Noise Levels:-** Day equivalent noise levels, Night equivalent noise levels.
- **Water Quality:-** Groundwater Quality, Surface Water Quality.
- **Soil Quality**
- **Ecology**
- **Socio Economic Status**

3.5 METHODOLOGY

Riverbed Mining in Himachal Pradesh is undertaken through a structured framework defined in the District Survey Reports (DSRs). These reports delineate suitable mining zones by analyzing erosion and slope stability. Operations are carried out using manual techniques, deliberately avoiding drilling and blasting to minimize environmental impacts.

The adopted methodology integrates geospatial mapping, field surveys, and slope stability assessments along with soil and vegetation regeneration studies to promote ecological sustainability. Furthermore, this chapter of the EIA report outlines the approaches employed to study key environmental components, including air quality, water resources, soil characteristics, noise levels, meteorological conditions, biodiversity, and socio-economic aspects. These investigations establish the baseline environmental status and provide the foundation for predicting potential impacts of mining activities.

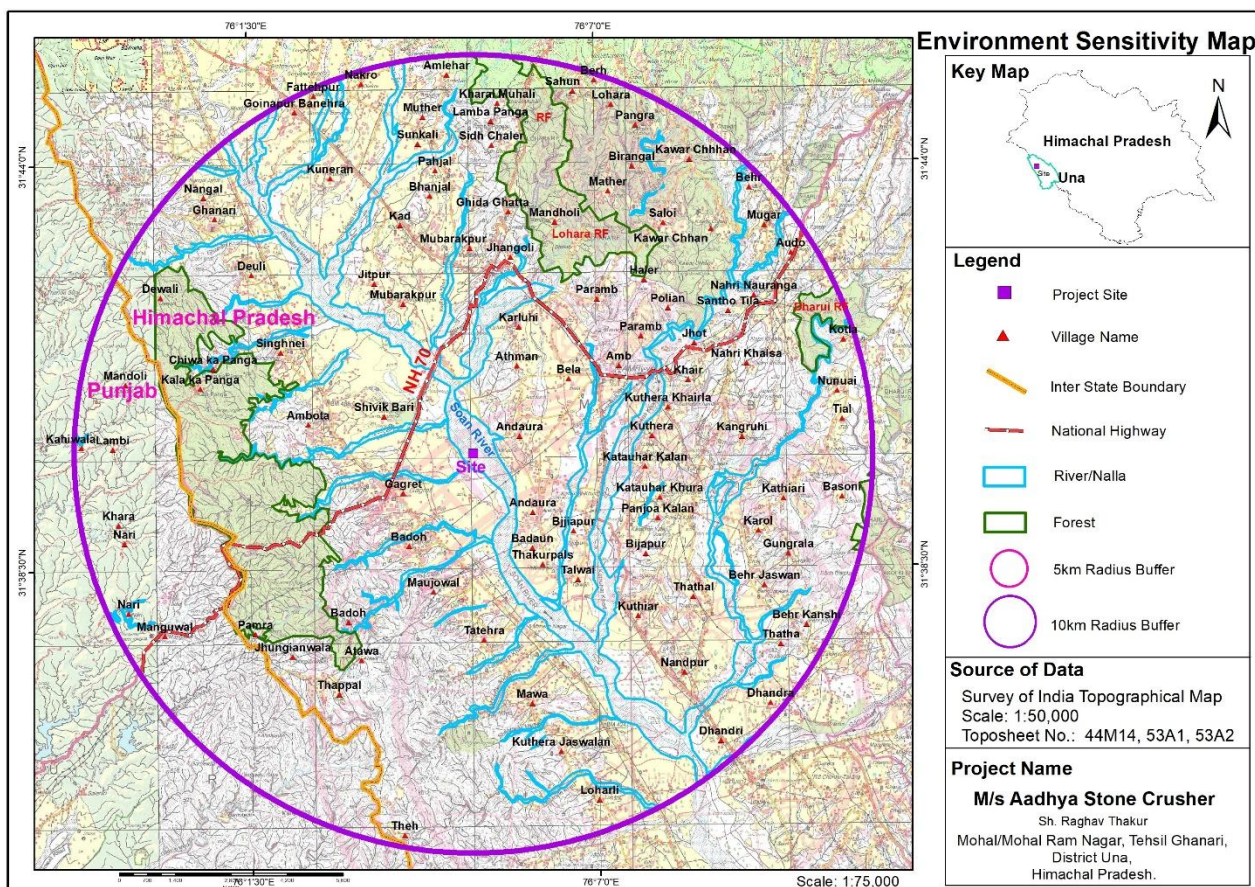


FIGURE 3-1 ENVIRONMENTAL SENSITIVITY MAP DEPICTING THE PROJECT SITE WITHIN 5 KM AND 10 KM RADIUS

3.6 ESTABLISHMENT OF BASE LINE FOR VALUED ENVIRONMENTAL COMPONENT AS IDENTIFIED IN THE SCOPE

The baseline study captures the physiography and topography of the area, along with hydrology and drainage patterns, while demographic features of nearby settlements are assessed to provide a comprehensive foundation for impact evaluation.

3.7 PHYSIOGRAPHY, TOPOGRAPHY AND HYDROLOGY

3.7.1 Physiography

Una district lies in the south-western of Himachal Pradesh. It is bounded by Kangra district in the north and north-east. Hamirpur district in the east. Bilaspur in the south-east and Punjab in the west and south. The district is stretched between 31 ° 17' 52" -31 ° 52' 0" north longitudes and 75° 58' 0" -76° 28' 25" east longitudes.

Una district covers an area of 1.550 sq. kilometers The Himalayan foothill zone is bounded by the plains of Punjab in the west and Solasinghi Dhar in the east. In the western part also, there

is a hill range whose maximum height is about 600 meters. The ranges trend in a general NW-SE direction and the area between these forms longitudinal valleys of the Swan River. The altitudes of the area vary from 350 meters to 1.200 meters on the Salasinghi Dhar. Shiwalik range experiences heavy rainfall. The Swan River itself is a tributary of the Satluj River, and the confluence is just south of Santokhgarh. The hill ranges are covered by scanty vegetation comprising mostly shrubs. The breadth of Jaswan Dun Valley ranges from 7 kilometres to 14 kilometres and the town of Una, which is not in the middle of the Dun, is on the elevation of 427 above sea level.

The Sub-Himalayan hills, commonly known as Solasinghi or Jaswan Dhar range commence near Talwara on the Beas where the river touches the district running south-east. Its culminating ridge forms the borders between this district and Kangra. Passing southwards, it increases steadily in width and elevation until its highest point reaches Bharwain which is 1182 meters above sea level Here, the regular formations, central range slopping in the series of the undulating valley to the Satluj on the one side and the Swan on the other side and change its character. The range still runs toward. Satluj. its north side submerging gradually into Satluj valley, but on the south, it has an abrupt fall of 61 meters and 91 meters and between the main range and the plains. Jaswan Dun is a wide tableland thickly wooded reveal to divide into natural blocks by numerous deep ravines. This area is nearly 24 kilometres in length and 21 kilometres in width is thickly forested. At the short distance south of Amb. the Solasinghi ranges and Jaswan Dhar range recede eastward, ceasing to form the boundary of the district and the plains at this point form of kind of bay in the hills which is shut in by Solasinghi, to the northeast and on the south by another range commencing a few kilometres north of Una. The latter runs southwards in a series of undulating hills low in height with an even front towards Jaswan Dun. Across the Satluj, the range breaks into a series of parallel ranges of no more height, but rocky and precipitous, through their slopes are well covered with grass and brushwood. This range is separated from Solasinghi Dhar by Satluj which is for more than 48 Kilometers and runs northwards until it turns westwards into Jaswan Dun. Una is bounded by the river Satluj on the north and river Satluj on the east, the Swan River, which is a Perennial river, flows right across the Jaswan valley towards the south and submerges in the Satluj near Anandpur. The Swan River indeed is the life belt of Jaswan Dun Valley which on its course receives innumerable tributaries both from the right and right thereby abounding quick sands and is risky to cross when in spade.

Una district nestles between the Siwalik ranges and forms part of the lesser Himalayas. It has a diverse landscape made of hills, valleys with piedmont zone, and terraces. The elevations of the land surface in the district vary from 340 m in the southeastern part to 1041 m above sea level (ASL) in the eastern part of the district. There are three hill ranges, i.e. Chamukha Dhar with a maximum elevation of 1041m AMSL. which borders with district Hamirpur. Dhionsar

Dhar with a maximum elevation of 950m AMSL and Ramgarh Dhar with a maximum elevation of 997m AMSL. On the southwest border with Punjab, Siwalik Hill ranges from a hilly upland or plateau area with an elevation up to 666 m above mean sea level. The vast area between the northwesterly & southeasterly hill ranges, on both sides of river Swan, is the Una valley. The undulating to plain fertile Una valley has an area of about 455 sq km and it extends from Daultpur in the north-west to Santokhgarh in the south-east.

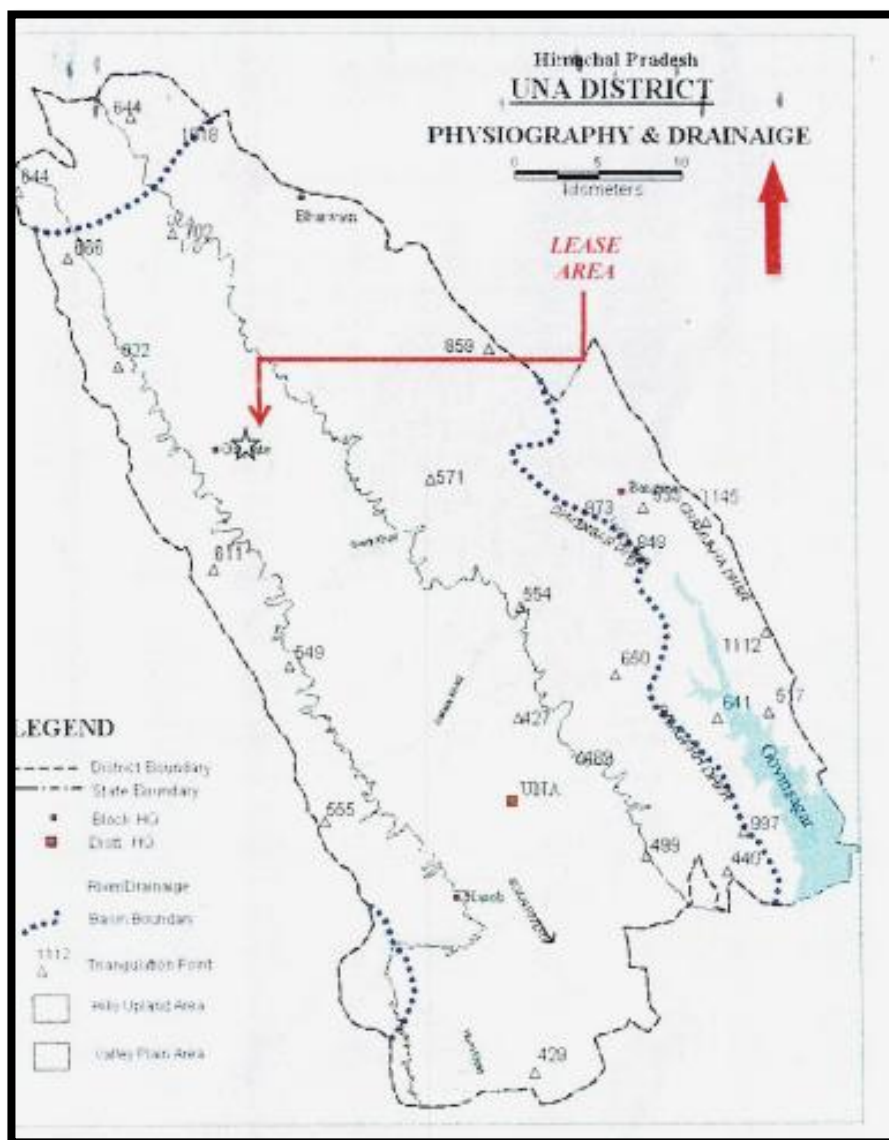


FIGURE 3-2 PHYSIOGRAPHY AND DRAINAGE MAP OF DISTRICT UNA

Swan River, a tributary of river Satluj, drains the major part (80%) of the Una district. Swan is an intermittent river and maintains base flow in the lower reaches. Swan river has about 80% catchment area in Una district and divides the district into two parts. Swan river flows in a

southeastern direction and has a wide channel and exhibits braided nature. It originates near Dharamsala(Daulatpuri in the northeastern part and leaves the district near Santokhgarh and subsequently joins the river Satluj. A number of local streams (about 73 khads) join the river within the district. During monsoon, the Swan river gets flooded due to shallow bank heights & large areas on both sides get affected. The GoHP has initiated riverbank protection cum flood control measures, and the work is in progress.

***Source:-** Mine plan

3.7.2 Topography

Una District’s topography is a blend of hilly terrain (Shivalik ranges) and fertile plains, making it unique among Himachal districts. The variation in elevation and physiographic diversity strongly influence its agriculture, settlement patterns, and connectivity with Punjab.

3.7.3 Drainage

The adjoining area shows a dendritic type of drainage with the formulation of gullies. Only small gullies pass beside the mining lease area. These Small gullies drain into the local Nallah and further drain into the Satluj River, which is a perennial stream of the area.

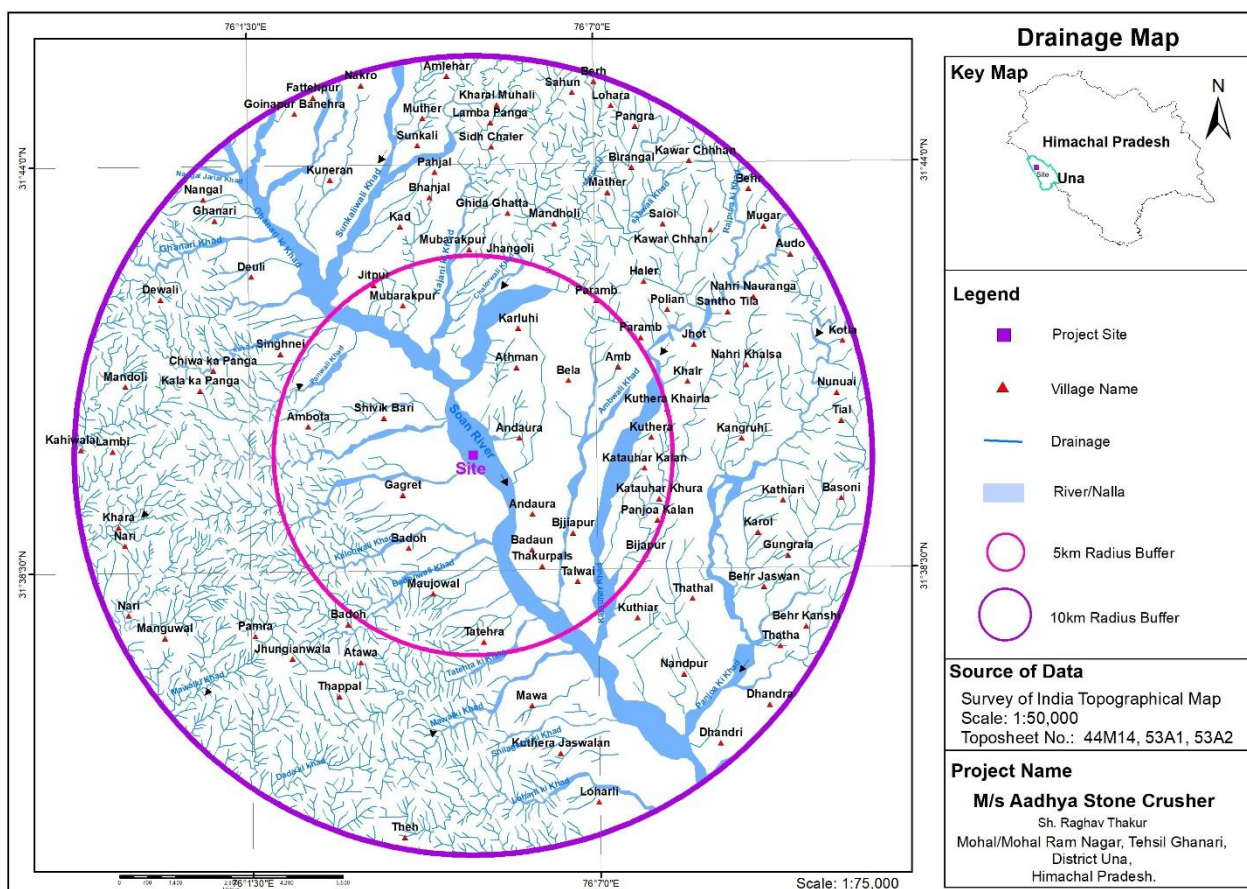


FIGURE 3-3 MAP SHOWING DRAINAGE NETWORK OF THE STUDY AREA

3.8 LAND USE COVER MAPPING

Since the mining is carried out by opencast mining method, studies on land environment of ecosystem play an imperative role in identifying susceptible issues and taking appropriate action to uphold ecological equilibrium in the region. The main objective of this section is to provide a baseline status of the study area covering a 10 km radius around the proposed mine site so that Temporal Changes due to mining activities on the surroundings can be assessed for future.

Land use/Land cover Map has been broadly classified into five classes namely Agriculture, Forest Land, Built-up Area, Water Bodies and Waste Land and all other land uses have been categorized in others class. Using the image classification algorithm land use map is than generated.

3.9 METHODOLOGY ADOPTED FOR THEMATIC DATA EXTRACTION FROM THE SATELLITE IMAGERIES

ERDAS image processing software and Arc GIS Software were used for the project. Erdas 9.2 Image Processing Software was used for digital processing of spatial data. Digital image processing techniques were applied for the mapping of the land use/land cover classes of the provided area from satellite data.

- **Image Extraction**

Satellite imageries were obtained and a subset for the Area of Interest was created through ERDAS image processing software.

- **Geo-Rectification:**

Geometric correction includes correction for geometric distortions due to sensor, earth geometry variations and conversion of the data to real world coordinates (e.g. Latitude and Longitude) on the Earth's surface. The satellite imagery was geometrically rectified with reference to the geo-referenced Topo-sheets and vector data.

- **Image Enhancement:**

Image enhancement is one of the important image processing functions primarily done to improve the appearance of the imagery to assist in visual interpretation and analysis. Various options of image enhancement techniques were tried out to get the best image for visual interpretation. Histogram equalized stretch enhancement techniques was applied to the imagery of the study area for better interpretation of different features in the satellite imagery.

- **Classification:**

Satellites images are composed of an array of grid; each grid has a numeric value that is known as digital number. The smallest unit of this grid is known as a pixel that captures reflectance of ground features represented in terms of Digital number, which represent a specific land feature. Using image classification technique, the satellite data is converted into thematic information map based on the user's knowledge about the ground area.

Hybrid technique has been used i.e., visual interpretation and digital image processing for identification of different land use and vegetation cover classes based on spectral signature of geographic feature. Spectral signature represents various land use classes Image interpretation keys are developed based on image characteristics like color, tone, size, shape, texture, pattern, shadow, association etc. which enables interpretation of satellite images for ground feature. Training sites are then assigned based on their spectral signature and interpretation elements.

Land use/Land cover Map has been broadly classified into five classes namely Agriculture, Forest Land, Built-up Area, Water Bodies and Waste Land and all other land uses have been categorized in others class. Using the image classification algorithm land use map is than generated.

3.10 LAND USE/LAND COVER STUDY

The present Land use/Land cover map for the proposed project activity is prepared by latest satellite image. This report thus will enable assessing the impact on land use pattern in the study area due to the proposed project activity. Land use in Una District is given in the table below:-

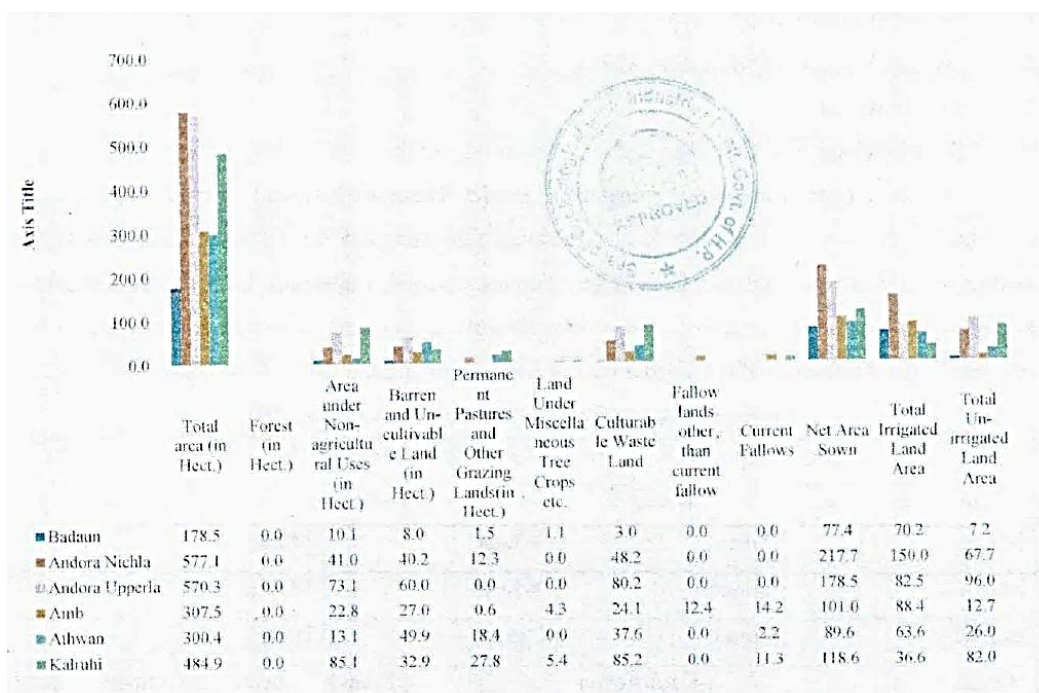


FIGURE 3-4 LAND USE PATTERN OF SORROUNDING VILLAGES IN UNA DISTRICT

*Source:- Approved Mine plan

(a) Data used

Current vintage data of Landsat-8 OLI/TIRS FCC (False Colour Composite) downloaded from USGS Earth Explorer has been used for preparation of Land use/ Land cover thematic map of study area. The downloaded satellite data is already Georeferenced, and terrain corrected. A total number of seven bands have been stacked and resampled at 30 m resolution. Google earth was used as reference for the preparation of base layer data like road, rail network, villages, and plant site.

i) Technical Details:-

Satellite Image	Landsat-8OLI/TIRS
Satellite Data Source	USGS Earth Explorer
Software Used	ArcGIS 10.1 & e-Cognition 9.2

(b) Methodology

Land use/Land cover map preparation, base map creation; Layer Stacking of satellite image has been processed using ArcGIS 10.1 Software. The methodology used for present LU/study area is given below: - The LULC maps were generated using Landsat-8 satellite data, the bands used were ultra-blue, blue, green, red, Near Infra-Red (NIR), SWIR-1 and SWIR-2; these were stacked at 30 m of spatial resolution. Object oriented classification method was implemented in e-Cognition 9.2 software. In this classification approach the image is divided into objects by using multi-resolution segmentation. As this is a supervised classification algorithm sample objects are selected for all the classes from the segmented image. The meaning of the selected bands is used as object features for differentiating classes from each other. Finally, nearest neighborhood classification algorithm is applied. Certain anomalies in classified output are removed using manual editing tool. The results were then exported as ESRI shape files into ArcGIS 10.1 and area calculation for different classes was done. The final map was prepared using ArcGIS layout view by adding all the layers and map information like North arrow, scale bar, legend, and the title for the map.

Table 3-1 LAND USE PATTERN OF VILLAGES AROUND THE MINE LEASE AREA

Sr. No.	Name of Villages	Total area (in Hect.)	Forest (in Hect.)	Area under Non-agricultural Uses (in Hect.)	Barren and Un-cultivable Land (in Hect.)	Permanent Pastures and Other Grazing Lands(in Hect.)	Land Under Miscellaneous Tree Crops etc.	Culturable Waste Land	Fallow lands other than current fallow	Current Fallows	Net Area Sown	Total Irrigated Land Area	Total Un-irrigated Land Area
1	Badaun	178.5	0.0	10.1	8.0	1.5	1.1	3.0	0.0	0.0	77.4	70.2	7.2
2	Andora Nichla	577.1	0.0	41.0	40.2	12.3	0.0	48.2	0.0	0.0	217.7	150.0	67.7
3	Andora Upperta	570.3	0.0	73.1	60.0	0.0	0.0	80.2	0.0	0.0	178.5	82.5	96.0
4	Amb	307.5	0.0	22.8	27.0	0.6	4.3	24.1	12.4	14.2	101.0	88.4	12.7
5	Athwan	300.4	0.0	13.1	49.9	18.4	0.0	37.6	0.0	2.2	89.6	63.6	26.0
6	Kalruhi	484.9	0.0	85.1	32.9	27.8	5.4	85.2	0.0	11.3	118.6	36.6	82.0

TABLE 3-2: LAND USE COVER OF THE STUDY AREA

S.No.	Class	Area in Ha.	Percentage
1	Built up Area	1820	5.79
2	River/Water Bodies	2160	6.88
3	Agricultural Land	7220	22.98
4	Scrub Land	17074	54.35
5	Forest	3141	10.00
Total		31415	100

*Source: Approved Mine plan

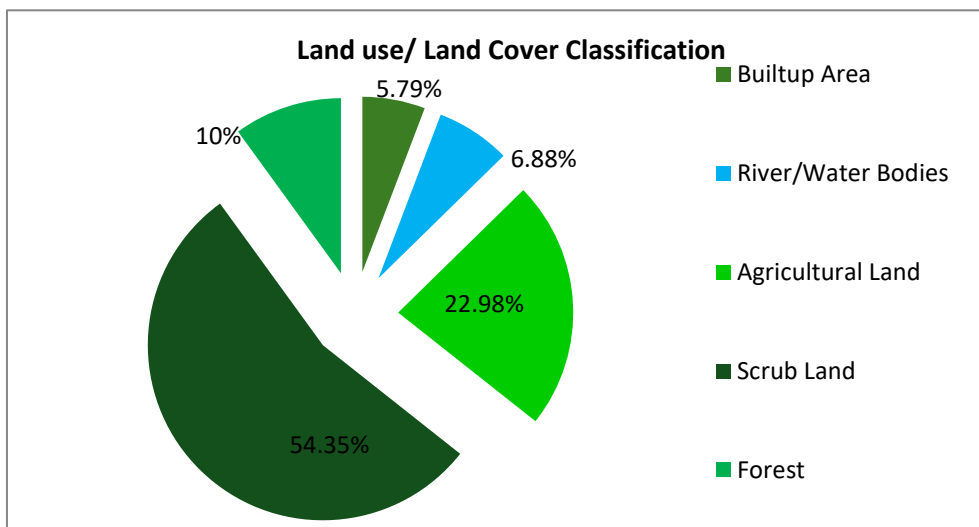


FIGURE 3-5 GRAPH GRAPHICAL PRESENTATION OF LAND USE/LAND COVER CLASSIFICATION

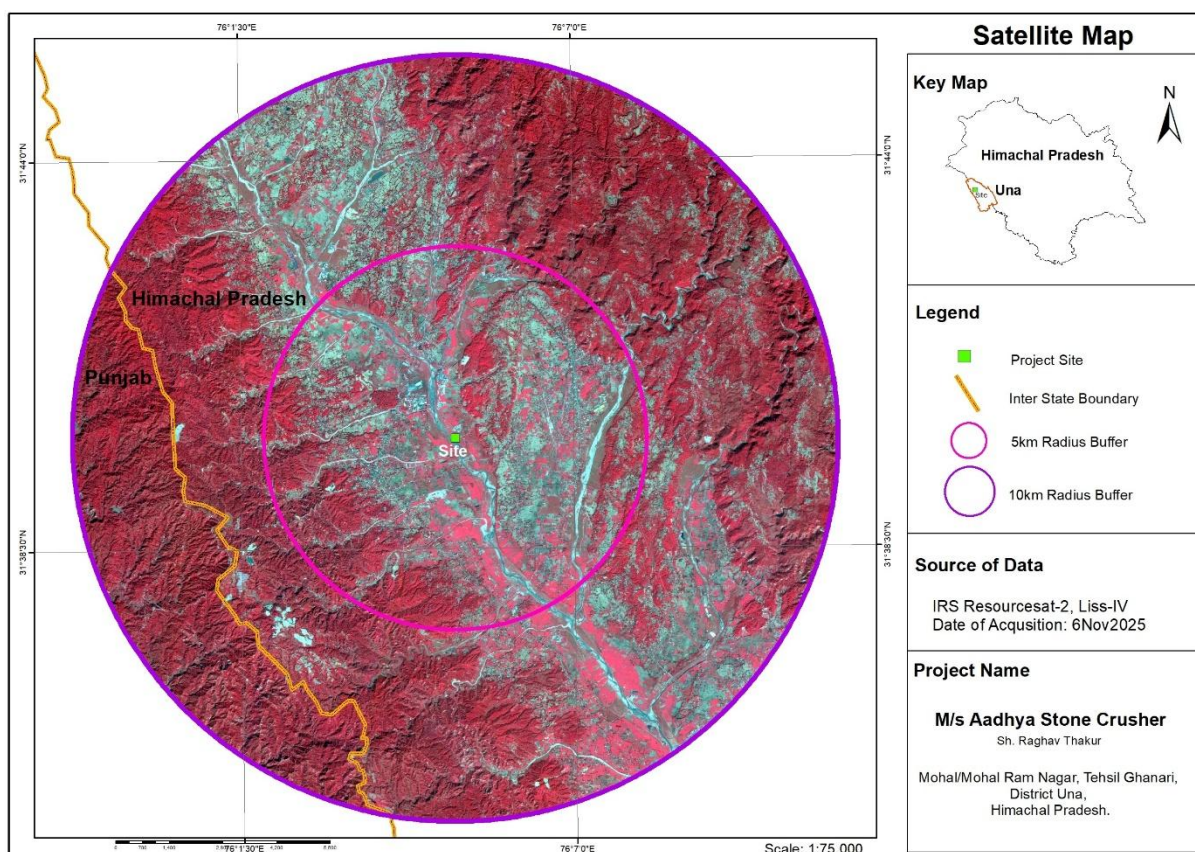


FIGURE 3-6: SATELLITE MAP OF THE STUDY AREA WITHIN 10 KM

3.11 SOIL ENVIRONMENT

The soils of Una district in Himachal Pradesh are predominantly alluvial and loamy, formed in the Shivalik foothills. They vary from sandy loam in the plains to clay loam in upland areas, supporting diverse agriculture. Frequent erosion and deposition, soil fertility and texture across the district.

3.11.1 Soil Characteristics

The fertility is an important aspect of the soil-plant relationship. Fertility status of the soils is primarily and importantly dependent upon both the macro and micronutrient reserve of the soil. Continued removal of nutrients by crops, with little or no replacement will increase the nutrient stress in plants and ultimately lowers the productivity. The fertility status of soil mainly depends upon the nature of vegetation, climate and topography, texture & decomposition rate of organic matter in the soil. Optimum productivity of any cropping systems depends upon adequate supply of plant nutrients.

The fertility of soil depends on the concentration of N, P, K, organic and inorganic materials, and water. Nitrogen is required for growth of plant and is a constituent of chlorophyll, plant protein, and nucleic acids. Phosphorus is most often limiting nutrients remains present in plant cell nuclei and act as energy storage. It helps in transfer of energy. Potassium is found in its mineral form and affect plant cell division, carbohydrate formation, translocation of sugar, various enzyme actions and resistance to certain plant disease, over 60 enzymes are known to require potassium for activation.

It is essential to determine the potential of soil in the area to identify the current impacts of urbanization and industrialization on soil quality and predict impacts which may arise due to the project operations. Accordingly, a study of assessment of the baseline soil quality has been carried out.

3.11.2 Protocol for Assessment of Soil physico-chemical Properties

Manual Methods of Soil Testing in India, Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India, New Delhi, shall be followed for collection of soil samples, its preparation for testing and analyzing various physio-chemical properties of soil.

3.11.2.1 Selection criteria for Soil Sampling Location

For studying soil quality of the study area and with a view to ascertain the impacts due to operation activities on the nearby agriculture land forest land, four sampling locations, representing various land use conditions, were selected to assess the existing soil conditions in and around the project area of impact area. The location of the soil samples is presented in **Table 3-3** and shown in **Figure 3-7**.

TABLE 3-3: SOIL SAMPLING LOCATION

Station Code	Station Name	Distance (Km)	Direction	Latitude and Longitude	Type of Land
S1	Project Site 1	.....	.....	31.668367°, 76.082916°	Within mine site
S2	Ambota Village	0.54	North	31.673110°, 76.081216°	Agriculture land
S3	Chandpur Village	0.10	East	31.667668°, 76.086407°	Non-Agriculture land
S4	Jindbar Village	0.45	SE	31.664141°, 76.088628°	Agriculture land
S5	Baheri Village	0.97	NNE	31.675621° 76.088754°	Forest land
S6	Gagret Village	0.60	South	31.661223°, 76.084035°	Agriculture land
S7	Rampur Village	0.48	WSW	31.666075°, 76.079333°	Agriculture land
S8	Gagret, Kaloh Village	3.55	WSW	31.650597°, 76.052907°	Forest land

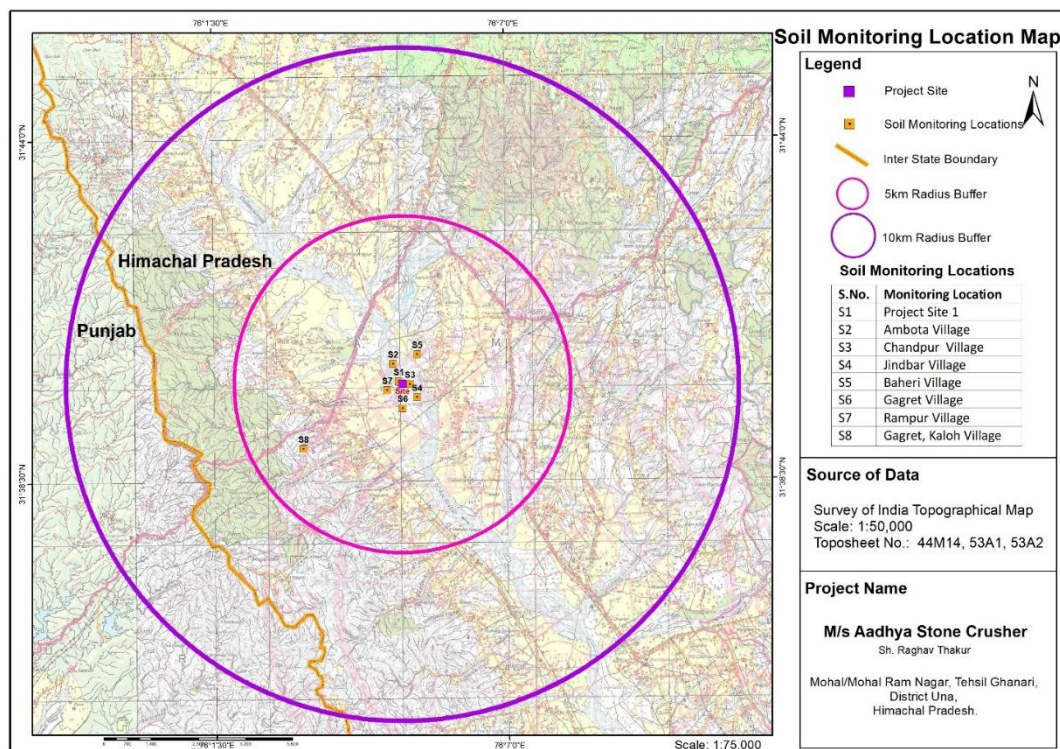


FIGURE 3-7 : SOIL SAMPLING LOCATIONS MAP

3.11.3 Soil reaction classes and critical limits for Macro and Micronutrients in soil

According to *Soil Survey Manual* (IARI, 1970), the soils are grouped under different soil reaction classes range of macro and micronutrients, organic carbon, SAR and electrical conductivity, which are extracted in **Table 3-4**.

TABLE 3-4: RANGE OF SOIL REACTION CLASS, MICRO AND MACRO NUTRIENTS

Sr. No.	Soil Nutrients					Soil Fertility Range				
						Low	Medium	High		
1	Organic carbon as a measure of available Nitrogen (%)					<0.5	0.5-0.75	>0.75		
2	Available N (kg/ha)					<280	280-560	>560		
3	Available P (Kg/ha)					<10	10-24.6	>24.6		
4	Available K (kg/ha)					<108	108-280	>280		
5	Soil Reactivity	Extremely acidic	Very strongly acidic	Strongly acidic	Moderately acidic	Slightly acidic	Neutral	Slightly alkaline	Moderately alkaline	Strongly alkaline
	pH Range	<4.5	4.5 – 5.0	5.1 – 5.5	5.6-6.0	6.1-6.5	6.6-7.3	7.4-7.8	7.9-8.4	8.5-9.0
6	Micronutrients					Critical Levels (Deficient)		Critical Levels (Sufficient)		
(i)	Available Zinc (mg/l)					<0.6		>0.6		
(ii)	Available Boron (mg/l)					<0.5		>0.5		
(iii)	Available Iron (mg/l)					<4.5		>4.5		
(iv)	Available Manganese (mg/l)					<1.0		>1.0		
(v)	Available Copper (mg/l)					<0.5		>0.5		
7	Sodium Absorption Ratio									
	Excellent <1.0	Good 1-1.9	Fair 2- 3.9	Poor 4- 7.9	Very Poor 8- 14.9	Unacceptable > 15				
8	Electrical Conductivity (mS/cm)									
	Salt free (0-2) Salinity effect negligible		Slightly Saline (4-8) Yield of many crops restricted		Moderately Saline (8-15) Only tolerant crops yield satisfactorily		Highly Saline >15, Only very tolerant crops yield satisfactorily			

3.11.4 Soil Quality Analysis

The eight samples have been collected from the depth of 5cm to 15cm and representative samples are prepared by mixing thorough mixing. The homogenized samples were analyzed for physico chemical characteristics. The physical and chemical analysis results of the soil samples collected at site during post-monsoon 2026 are presented in **Table 3-5**.

TABLE 3-5: PHYSICO-CHEMICAL CHARACTERISTICS OF SOIL

Sr. No.	Parameters	Location	Project Site-S1	Ambota-S2	Chandpur -S3	Jindhar -S4	Baheri-S5	Gagret-S6	Rampur -S7	Gagret Kaloh-S8
		Units	Results	Results	Results	Results	Results	Results	Results	Results
1	pH	-	7.64	7.33	7.56	7.57	7.36	7.50	7.65	7.72
2	Conductivity	µmhos/cm	398	416.15	428.02	351.20	451.0	402.0	448.0	378.0
3	Sodium (as Na)	mg/kg	88.21	71.52	84.4	96.53	85.40	82.10	76.0	91.0
4	Water holding capacity	%	28.4	26.0	28.2	26.0	32.10	34.50	40.02	37.02
5	Potassium (as K)	mg/ kg	241.03	248.0	250.8	251.0	271.50	267.40	289.0	214.0
6	Sand	%	66.00	56.00	60.00	65.00	65.00	66.00	68.00	64.00
7	Clay	%	15.00	26.00	26.00	17.00	18.00	18.00	20.00	20.00
8	Silt	%	19.00	18.00	14.00	18.00	17.00	16.00	12.00	16.00
9	Calcium (as Ca)	mg/kg	798.0	734.0	812.3	755.65	957	886.00	738.0	880.0
10	Magnesium (as Mg)	mg/kg	316.0	308.5	350.0	249.97	514	468.50	370.0	367.0
11	SAR	-	0.97	0.63	0.63	0.63	1.08	0.98	0.96	0.96
12	CEC	meq/100gm	2.15	1.89	1.99	1.84	2.26	2.20	2.70	2.32
13	Phosphorus (as P)	mg/kg	10.84	18.52	18.67	18.54	12.80	12.40	12.88	10.17
14	Organic carbon	%	0.46	0.38	0.26	0.36	0.49	0.46	0.56	0.55
15	Porosity	%	40.98	36.8	34.83	34.64	45.20	40.10	44.02	42.06
16	Permeability	cm/hr.	1.95	1.78	1.64	1.45	1.96	1.84	1.60	1.68
17	Bulk Density	kg/cm ³	1380	1560	1278	1530	1421	1180	1654	1311
18	Total Kjeldahl Nitrogen (TKN)	%	0.029	0.041	0.042	0.034	0.033	0.037	0.032	0.036

3.11.5 Interpretation of Soil Characteristics

Interpretation of Soil Characteristic has been dwelled in following sub-sections:-

Soil Texture: The soil textures refer to proportion of mineral composition of soil i.e., sand, clay, and silt present in the soil sample. The most commonly observed soil textures are sandy loam.

Soil pH:- Soil pH is an important soil property, which affects the availability of several plant nutrients. It is a measure of acidity and alkalinity and reflects the status of base saturation. It measures the -ve logarithm of hydrogen ions activity of soil solution and defines the soil acidity and alkalinity. The soil pH ranges from 7.33 to 7.72, thereby indicating the soils are neutral to moderately alkaline.

Soil Conductivity:- The Conductivity of the soil ranges from 351.20 μ mhos/cm to 451.0 μ mhos/cm, thereby indicating the soils are slightly saline.

Organic Carbon:- The effect of soil organic matter on soil properties is well recognized. Soil organic matter plays a vital role in supplying plant nutrients, cation exchange capacity, improving soil aggregation and hence water retention and soil biological activity. The organic carbon content of soil varied from 0.26% to 0.56%, thereby implying that soils are rich in organic carbon.

Total Kjeldahl Nitrogen (TKN):- Total Kjeldahl Nitrogen (TKN) is vital for plant proteins, chlorophyll, and enzymes. It promotes vegetative growth and leaf greenness, while deficiency causes stunted growth and chlorosis. Surface soils contain 276–320%, indicating low available nitrogen.

Available Phosphorus:- Phosphorus is an important component of adenosine di-phosphate (ADP) and adenosine triphosphate (ATP), which involves in energy transformation in plant. It is an essential component of deoxyribonucleic acid (DNA), the seat of genetic inheritance in plant and animal. Phosphorous take part in important functions like photosynthesis, nitrogen fixation, crop maturation, root development, strengthening straw in cereal crops etc. The availability of phosphorous is restricted under acidic and alkaline soil reaction mainly due to P-fixation. In acidic condition it gets fixed with aluminum and iron and in alkaline condition with calcium. Available phosphorus content ranges between 10.17 to 18.67 mg/kg thereby indicating that soils are high in available phosphorus.

Available Potassium:- Potassium is an activator of various enzymes responsible for plant processes like energy metabolism, starch synthesis, nitrate reduction and sugar degradation. It is extremely mobile in plant and helps to regulate opening and closing of stomata in the

leaves and uptake of water by root cells. It is important in grain formation and tuber development and encourages crop resistance for certain fungal and bacterial diseases. Available potassium content in the soil ranges between 214 to 289 mg/kg, thereby indicating low to medium potassium content in the area.

Micronutrients:- Proper understanding of micronutrients availability in soils and extent of their deficiencies is the pre-requisite for efficient management of micronutrient fertilizer to sustain crop productivity. Therefore, it is essential to know the micronutrients status of soil before introducing any type of land use.

Sodium Absorption Ratio:- The SAR values vary from 0.63 to 1.08, thereby indicating good to fare ratio.

3.12 AIR ENVIRONMENT

3.12.1 Meteorology Data

Meteorological study exerts a critical influence on air quality as it is an important factor in governing the ambient air quality. The meteorological data recorded during the study period is used for interpretation of the baseline information as well as input for air quality simulation models. Meteorological data was collected for post monsoon season. The Climate in the region shows broadly four seasonal variations namely.

Season	Months
Pre- Monsoon	March – May
Monsoon	June – September
Post Monsoon	October –December
Winter	December-February

Ambient air quality monitoring stations are selected primarily on the basis of surface, demographic and meteorological influence. The study of SO₂, NO₂, PM₁₀ & PM_{2.5} are carried out 24 hourly twice a week at each station. The study was done in post monsoon season for a period of 3 months January to March 2026.

3.12.2 Climate of the area

The Climate of the Una District can be classified into the following three categories.

1. Winter
2. Summer
3. Rainy

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The general temperature rainfall and humidity corresponding to each type are given below in Table and month-wise detail of temperature is shown in Graph. Below table showing climate of Una district in terms of weather, humidity, temperature and rainfall.

Climate		Winter	Summer	Rainy
Period		Oct.-Mid March	Mid. March-June	July-September
Weather		Cool	Hot	Humid
Humidity		84%	55%	98%
Temperature	Max.	33.0 C	45.5 C	35.0 C
	Min	-3.5.0 C	8.0 C	14.0 C
Rainfall	Max.	82.0 mm	69.0 mm	175. 0 mm
	Min	1.0 mm	1.0 mm	1.0 mm

The terrain in general has a profound influence on the temperatures of a region. The temperature generally rises from the beginning of March till June, which is the hottest month of the year with mean minimum and maximum temperatures of 25.6°C to 44°C respectively. With the onset of monsoons by the end of June temperature begins to fall. The drop in day temperature is much more than the drop in night temperature. The night temperature falls rapidly after the withdrawal of monsoons by mid-September. The month of January is the cooler month with the mean maximum and minimum temperature being 24°C and 1.7°C respectively. Under the influences of western disturbance, the temperature falls appreciably during winters, and it may go even below 0° C.

Humidity is generally low throughout the year. During the summer season, humidity is its lowest at 36%. During monsoon months, it goes as high as 80-90%. The highest levels of humidity are observed in the month of August. The average humidity during synoptic hours is 53% and 62% respectively. Table showing Climate in Una district.

Table showing Climate in Una district

CLIMATE	WINTER	SUMMER	RAINY SEASON
PERIOD	OCT.-MID MARCH	MID-MARCH -JUNE	JULY-SEPTEMBER
Weather	Cool	Hot	Humid

TABLE 3-6 TABLE SHOWING CLIMATE AROUND THE APPLIED LEASE AREA

Maximum & Minimum Temperature of District Una (Meteorological Centre-Una)						
MONTH	YEAR	2014	2015	2016	2017	2018
JAN	MAX	19.9	23.7	24.8	27	22.5
	MIN	4	-1.2	0.3	0.6	3.8
FEB	MAX	21.4	27.5	30	32.2	25.3
	MIN	6	1	4.7	5.5	7.9
MAR	MAX	27.2	35.8	35	38.2	31.6
	MIN	9.6	3	9	5.7	16.4
APR	MAX	32.8	39.2	40.6	43	35.8
	MIN	11.9	9.6	13.8	9	16.4
MAY	MAX	37.5	43.6	43.4	43	44.2
	MIN	17.8	11	18	16	20.4
JUN	MAX	40.6	42.2	43.7	44.8	38.2
	MIN	21.7	16	20.7	19.5	24
JUL	MAX	34.7	37.8	37.8	38	33.8
	MIN	22.6	16	22	21.7	24.1
AUG	MAX	34.5	36.4	39	36.2	33.2
	MIN	21.5	12	22.9	21.5	23.1
SEP	MAX	33	37.4	36	37.4	32.1
	MIN	18.8	12.3	19.8	18.7	21
OCT	MAX	30.6	35.2	35.2	36.6	32.1
	MIN	13.6	7	12.2	11.5	14
NOV	MAX	27.6	29.8	32	30.4	26.8
	MIN	6	2.8	6.8	4.8	9
DEC	MAX	20.5	26.3	29.8	28.6	22.9
	MIN	1.6	-3.3	3.6	4.3	3.6

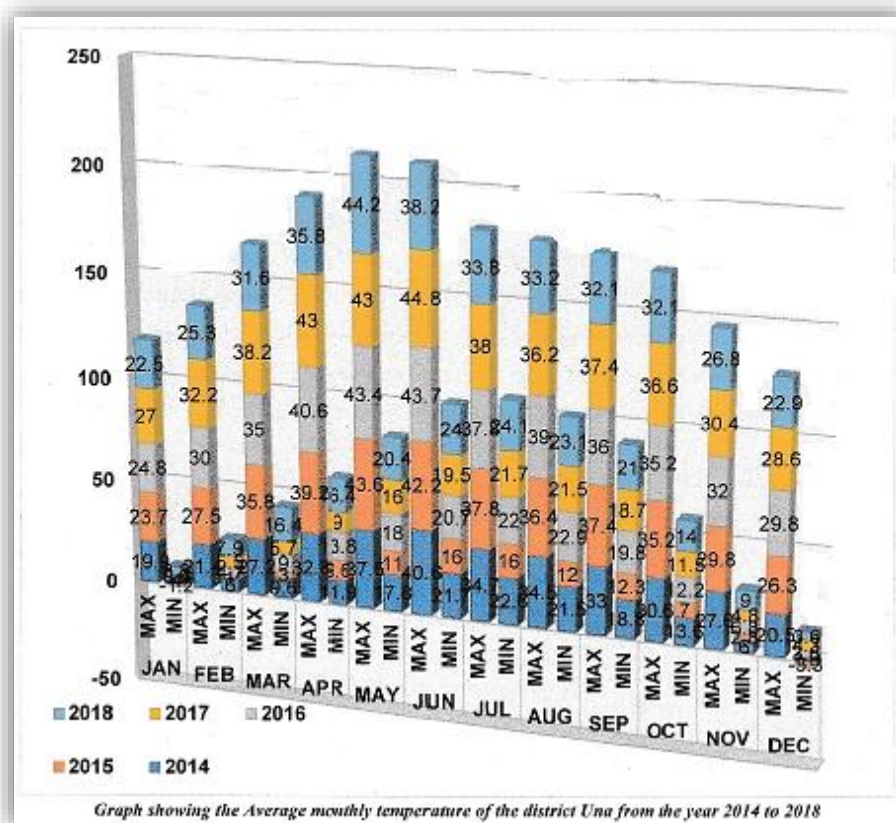


FIGURE 3-8 AVERAGE MONTHLY TEMPRATURE OF DISTRICT UNA

*Source:-Approved mine plan

3.12.3 Rainfall

The Una district can be divided into three rainfall zones as:-

- High Above 1400 mm
- Medium between 1400 to 1200 mm
- Low less than 1200 m

The average annual rainfall in the district is 1209.00 mm. about 70 % of the annual rainfall in the district is received during the short monsoon season July to September. July is the month with the heaviest rainfall. Rainfall amounting to about 14 % of the normal is received during the cold season in association with passing western distribution. The rainfall in the district generally increases from the southwest towards the northeast.

To have an idea about the morphogenetic zone on the basis of rainfall it will not be ideal to classify it on the basis of the annual rainfall because most of the precipitation of the year is received in the rainy season hence the precipitation of the monsoon season is deciding precipitation for annual replenishment, bank erosion and other factors.

Rainfall varies significantly with the altitude of the area. The catchment area receives rainfall due to western disturbances that pass over the north-western part of the country during the winter months. Rainfall in valleys is also received during the winter month. The rainy season generally starts from mid-July and extends up to mid-September. During winter the rains are scarce and extend from 15th December to 15th February. The following table shows the quantum of rainfall adjoining to the applied mining lease area. The following table shows the quantum of rainfall during the last 5 years from 2016 and 2020 adjoining to the applied lease area as per IMD.

UNA DISTRICT RAINFALL IN MILLIMETERS (R/F)												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
RAINFALL (IN mm)												
2018	15.9	22.6	18.7	32.6	14	195.7	290.6	456.3	425.9	8.4	7.7	3.3
2019	74.8	184	34.2	27.4	21.9	29.2	281.9	462.5	119.9	29	14.9	49.5
2020	57.3	5.7	129.4	24.7	61.1	71.2	272.2	370.7	26.7	0	25.8	21.2
2021	20.2	4.1	12.1	55.6	35.9	94.4	298.5	149.3	167.2	66.7	0.4	1.4
2022	177	40.1	0.9	1.7	17.7	105.8	315.7	137.9	164.2	11.8	0	0.7

FIGURE 3-9 :- AVERAGE ANNUAL RAINFALL OF THE DISTRICT SIRMOUR

*Source – Approved mine plan

3.12.4 Micro-Meteorological Data

Period	Temperature (°C)		Precipitation (mm)	Wind Speed (Km/hr.)	% Relative Humidity	Pressure (mbar)
	Min.	Max.				
Jan-2026	5	25	87.6	2-3	72-74	1015

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Feb-2026	8	10	20-25	2-3	68-70	1013
Mar-2026	12	14	10-15	2-3	65-68	1010

Table showing Climate in Una district

CLIMATE AROUND THE MINING LEASE AREA DISTRICT UNA, HIMACHAL PRADESH			
CLIMATE	WINTER	SUMMER	RAINY SEASON
PERIOD	OCT.-MID MARCH	MID-MARCH -JUNE	JULY-SEPTEMBER
Weather	Cool	Hot	Humid

3.12.5 Wind Rose

Wind speed plays a crucial role in determining the dispersion of air pollutants, as it influences how far contaminants travel before settling. A wind rose is a graphical tool that illustrates wind speed and direction, with arms representing sixteen compass directions and showing the percentage frequency distribution of wind speeds.

During the study period from January to March 2026, wind rose diagrams were plotted at 24-hour intervals. The wind pattern observed during this period is presented below.:-

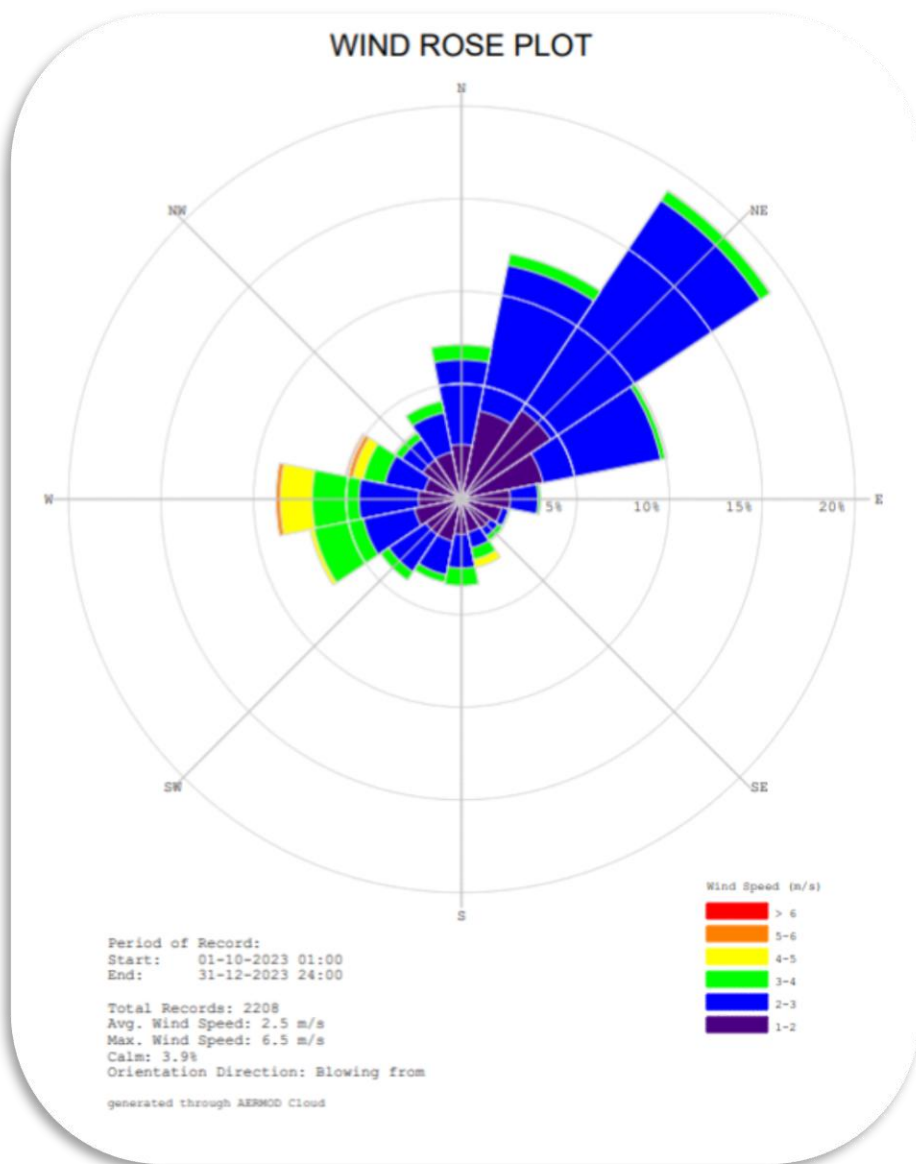


FIGURE 3-10: WIND ROSE OF MONITORING SEASON IN STUDY AREA

During the monitoring period (October–December 2023), the wind rose analysis revealed that the predominant wind directions were from the North-East (NE) and East (E) sectors, with winds most frequently blowing in these directions

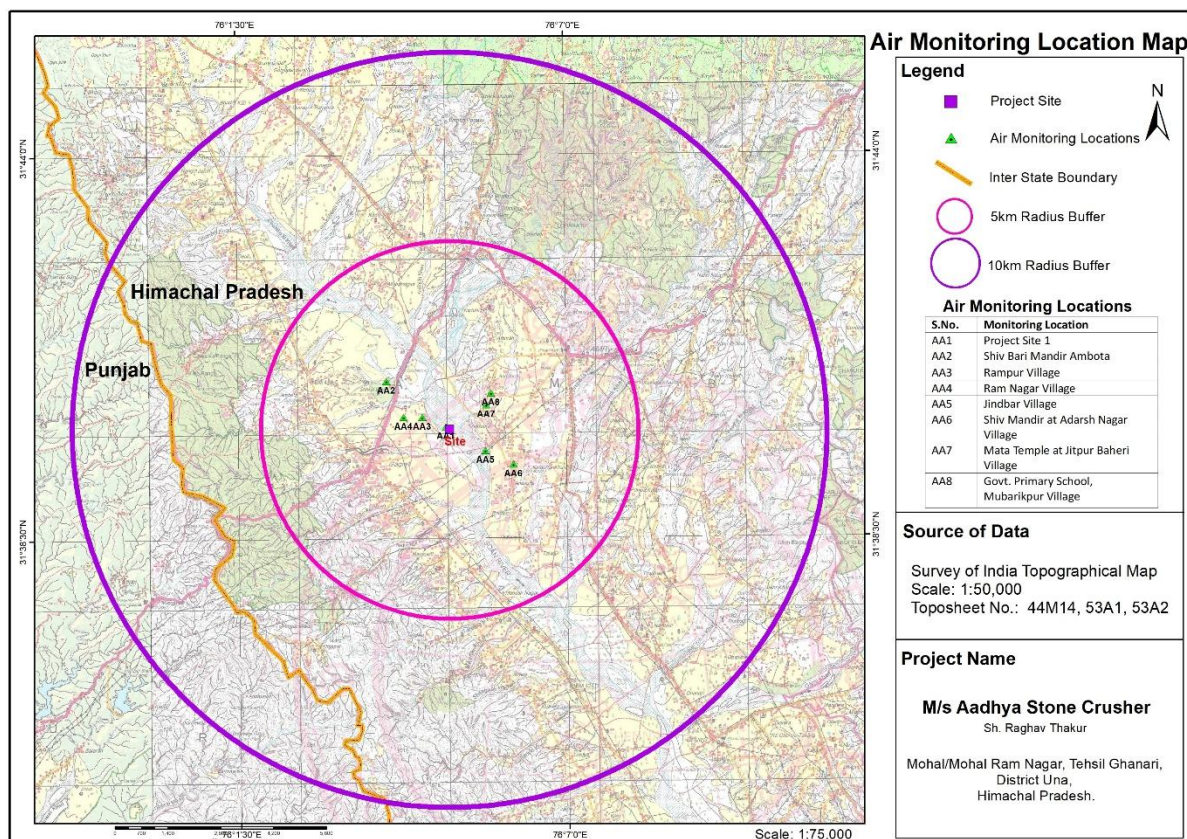


FIGURE 3-11: AMBIENT AIR MONITORING LOCATIONS

3.12.6 Method of Monitoring

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

a. Location of Ambient Air sampling Stations

Eight sampling stations were established around the core zone within a 5 km radius to study the present air quality. The locations are given below table.

TABLE 3-7 LOCATION OF AMBIENT AIR SAMPLING STATIONS

Station Code	Station Name	Distance	Direction	Latitude & Longitude	Criteria
AA1	Project Site 1	31.668367°, 76.082916°
AA2	Shiv Bari Mandir Ambota	1.98	NW	31.679325°, 76.066400°

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AA3	Rampur Village	0.65	NW	31.670671°, 76.076371°	Upwind direction
AA4	Ram Nagar Village	1.22	NW	31.673263°, 76.071104°	Upwind direction
AA5	Jindbar Village	0.95	SE	31.662570°, 76.093918°	Down Wind
AA6	Shiv Mandir at Adarsh Nagar Village	1.77	SE	31.659288° 76.101730°	Down Wind
AA7	Mata Temple at Jitpur Baheri Village	1.13	NE	31.673500°, 76.094257°	Cross Wind
AA8	Govt. Primary School, Mubarikpur Village	1.45	NE	31.676336°, 76.095599°	Cross Wind

b. Sampling Schedule

The baseline data of air quality data was conducted during the months Jan-March' 2026. Eight hourly samples were collected from each station round the clock, twice a week for continuous (three months).

c. Air Quality parameter

The following parameters were analyzed for each sample.

- Particulate matter (PM10)
- Particulate matter (PM2.5)
- Sulphur dioxide (SO2)
- Nitrogen dioxide (NO2)
- Carbon mono-oxide (CO)
- NH₃ (Ammonia)
- O₃ (Ozone)

The sampling and testing of ambient air quality parameters were carried out as per relevant parts of IS: 5182. The brief details of testing procedure adopted are given below:-

TABLE 3-8 PROCEDURE FOR DETERMINING VARIOUS AIR QUALITY PARAMETERS

Sr.No.	Parameters	Testing Procedure	NAAQS 2009 Standard (µg/m³)
1	PM₁₀	Gravimetric method using "Repairable Dust Sampler" (RDS) IS: 5182(P-23) 2004	100(µg/m³)



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2	PM _{2.5}	Gravimetric method using fine particulate Sampler (FPS) IS: 5182(P-23) 2004	60(µg/m ³)
3	NO ₂	Absorption in dil. Sodium Arsenic and then estimated calorimetrically with Sulphanilamide and N(I-Nepthayle) Ethylene diamine, Dihydrochloride and Hydrogen Peroxide IS: 5182(P-6)2006	80(µg/m ³)
4	SO ₂	Absorption in Sodium Tetra Cloro Mercurate followed by Colorimetric estimation using P-Rosaniline hydrochloride and Formaldehyde IS: 51182(p-2)2001	80 (µg/m ³)
5	Free Silica in PM ₁₀	FTIR Method	

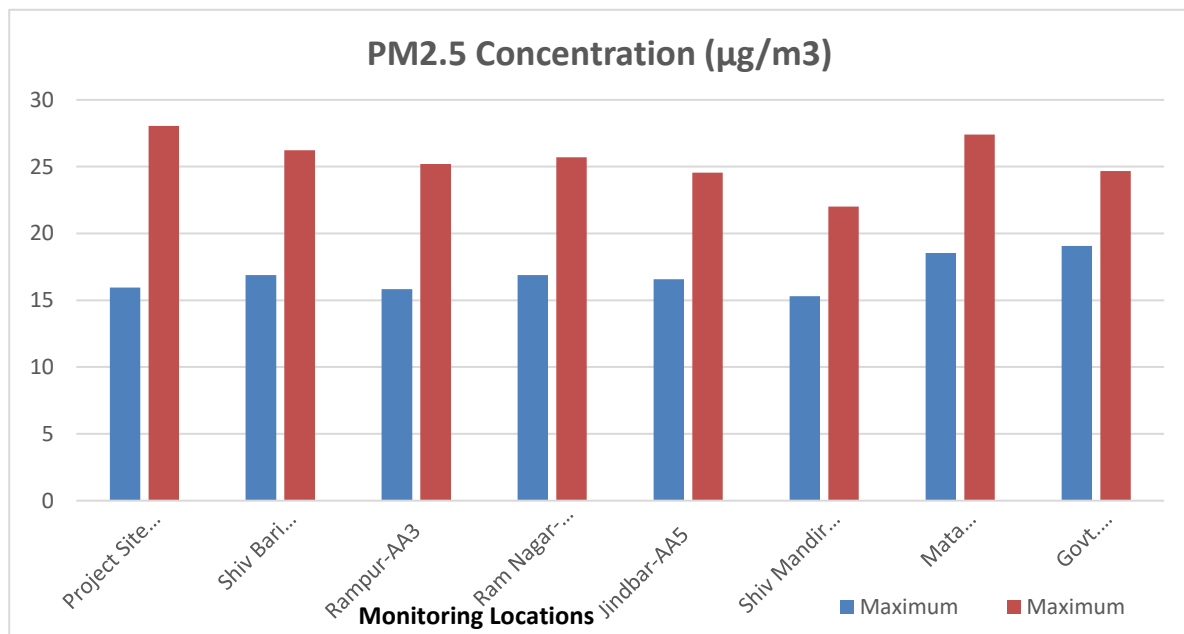
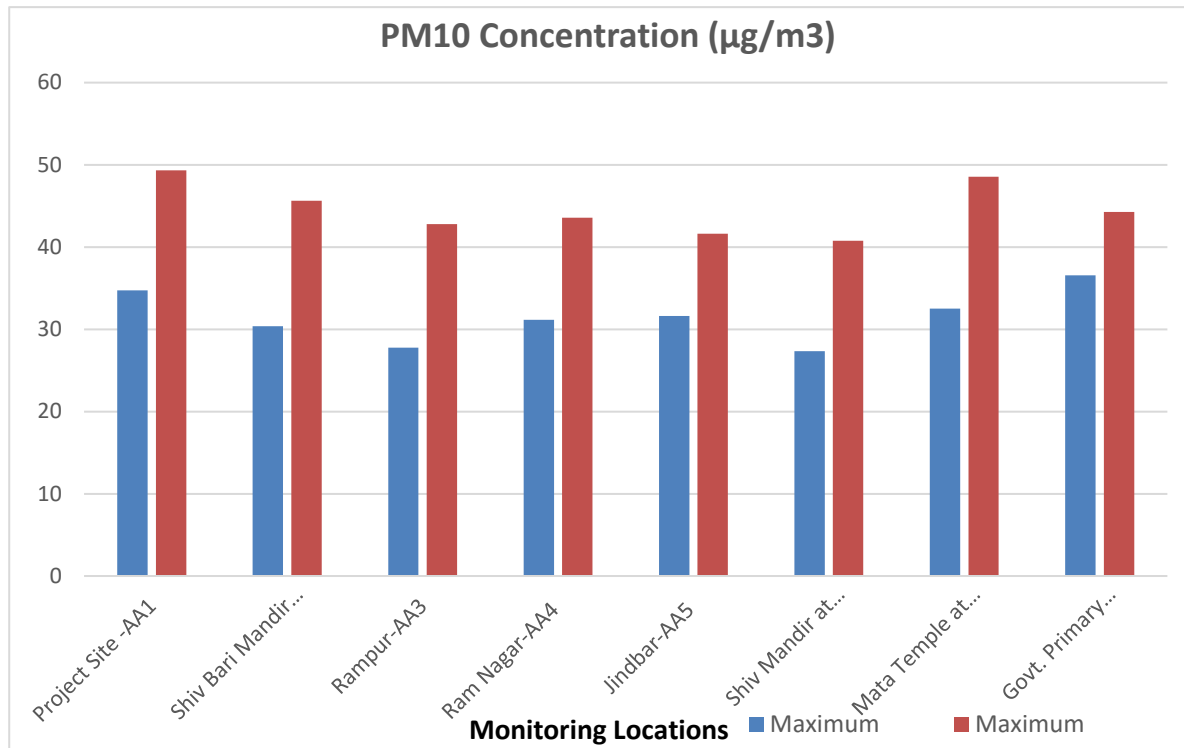
TABLE 3-9 AMBIENT AIR QUALITY RESULTS

AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m ³)	MAX. (ug/m ³)	AVG. (ug/m ³)	98% TILE	NAAQS LIMIT
PM ₁₀ (µg/m ³)	Project Site -AA1	34.72	49.35	41.77	48.61	100 (µg/m³)
	Shiv Bari Mandir Ambota-AA2	30.36	45.63	40.00	45.51	
	Rampur-AA3	27.78	42.78	37.31	42.72	
	Ram Nagar-AA4	31.14	43.58	37.73	43.46	
	Jindbar-AA5	31.63	41.63	37.14	41.50	
	Shiv Mandir at Adarsh Nagar-AA6	27.34	40.76	34.72	40.22	
	Mata Temple at Jitpur Baheri -AA7	32.52	48.57	41.27	47.96	
	Govt. Primary School, Mubarikpur-AA8	36.58	44.27	39.91	44.18	
PM _{2.5} (µg/m ³)	Project Site-AA1	15.96	28.05	20.48	26.93	60(µg/m³)
	Shiv Bari Mandir Ambota-AA2	16.88	26.23	21.95	26.23	
	Rampur-AA3	15.84	25.19	20.91	25.19	
	Ram Nagar-AA4	16.88	25.71	20.67	25.04	
	Jindbar-AA5	16.57	24.56	20.37	24.10	
	Shiv Mandir at Adarsh Nagar-AA6	15.31	22.01	18.90	21.85	
	Mata Temple at Jitpur Baheri -AA7	18.54	27.41	22.49	26.42	
	Govt. Primary School, Mubarikpur-AA8	19.06	24.68	21.74	23.98	

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AIR QUALITY PARAMETERS	LOCATION	MIN. (ug/m³)	MAX. (ug/m³)	AVG. (ug/m³)	98% TILE	NAAQS LIMIT
SO₂(µg/m³)	Project Site -AA1	07.10	9.40	8.37	9.36	80(µg/m³)
	Shiv Bari Mandir Ambota-AA2	07.48	13.89	10.56	13.75	
	Rampur-AA3	07.48	13.06	09.19	13.06	
	Ram Nagar-AA4	07.48	09.88	08.90	09.88	
	Jindbar-AA5	07.36	09.68	8.60	09.68	
	Shiv Mandir at Adarsh Nagar-AA6	05.46	08.63	07.10	08.61	
	Mata Temple at Jitpur Baheri -AA7	06.34	09.52	07.23	08.94	
	Govt. Primary School, Mubarikpur-AA8	05.52	09.18	06.82	08.73	
NO₂ (µg/m³)	Project Site -AA1	09.06	12.47	11.60	12.46	80(µg/m³)
	Shiv Bari Mandir Ambota-AA2	10.03	14.13	12.70	14.13	
	Rampur-AA3	09.90	14.13	12.66	14.13	
	Ram Nagar-AA4	10.10	14.33	12.72	14.33	
	Jindbar-AA5	10.20	12.85	11.65	12.85	
	Shiv Mandir at Adarsh Nagar-AA6	09.36	13.63	11.93	13.57	
	Mata Temple at Jitpur Baheri -AA7	09.27	14.06	12.02	13.96	
	Govt. Primary School, Mubarikpur-AA8	09.07	13.78	11.03	13.57	
CO	Project Site -AA1	0.16	0.22	0.19	0.22	
	Shiv Bari Mandir Ambota-AA2	0.27	0.64	0.44	0.64	
	Rampur-AA3	0.15	0.52	0.31	0.52	
	Ram Nagar-AA4	0.09	0.46	0.26	0.46	
	Jindbar-AA5	0.18	0.51	0.39	0.51	
	Shiv Mandir at Adarsh Nagar-AA6	0.21	0.36	0.29	0.36	
	Mata Temple at Jitpur Baheri -AA7	0.24	0.45	0.34	0.44	
	Govt. Primary School, Mubarikpur-AA8	0.27	0.52	0.37	0.52	

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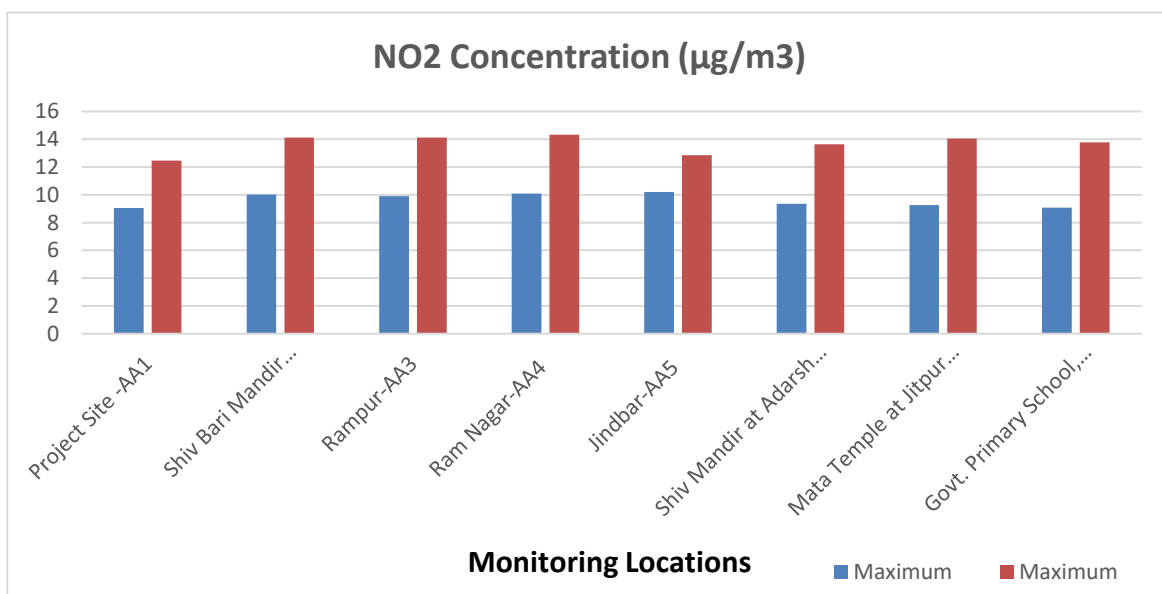
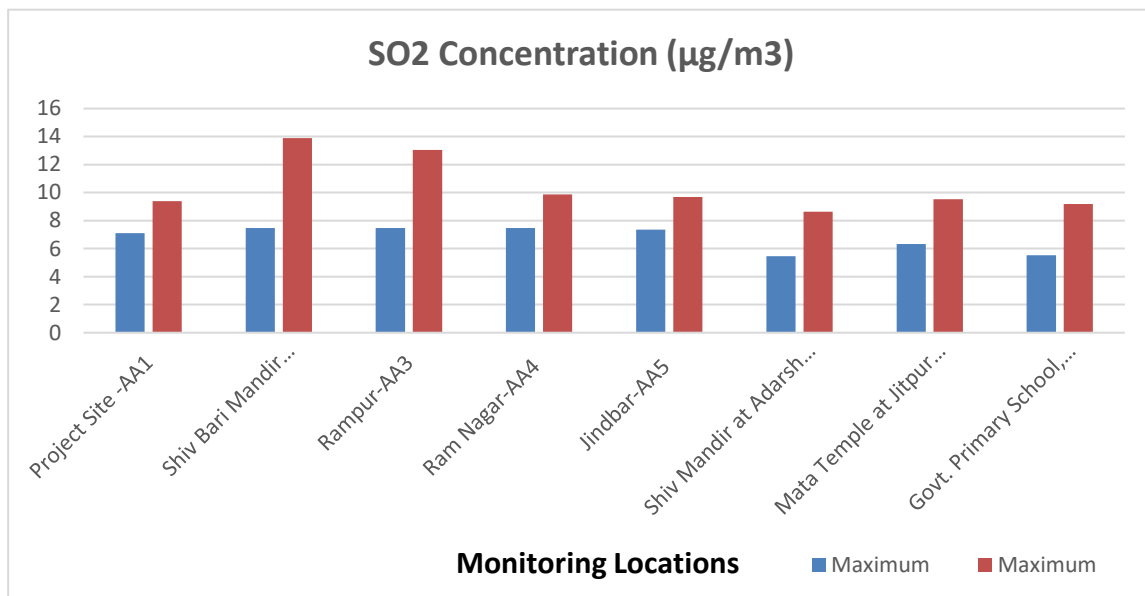


FIGURE 3-12: GRAPHICAL REPRESENTATION OF AMBIENT AIR QUALITY FOR POST MONSOON SEASON Jan-Mar' 2026

The National Ambient Air Quality Standards as notified on dated 18th November 2009, for Industrial as well as Residential, Rural and Other Area and results of monitoring are compared with the standards in **Table 3-10**.

Table 3-10 COMPARISON WITH AMBIENT AIR QUALITY STANDARDS ($\mu\text{g}/\text{m}^3$)

Pollutants	Standard Laid Down by CPCB (18/11/2009)	Max. Value Monitored in Study Area
	Industrial, Residential, Rural and Other Area	
PM10 $\mu\text{g}/\text{m}^3$	100 (24-hours)	49.35
PM2.5 $\mu\text{g}/\text{m}^3$	60 (24-hours)	28.05
SO ₂ $\mu\text{g}/\text{m}^3$	80 (24-hours)	13.89
NO ₂ $\mu\text{g}/\text{m}^3$	80 (24-hours)	14.33
CO	Max (8-hours)	0.64

From the above table, it can be concluded that the maximum value of ambient air quality monitored during monitoring season in the study area does not exceed the limit laid down by CPCB for all the parameters.

3.12.7 Air Quality Index (AQI)

The table given below shows the Air Quality Index (AQI) range & category:-

Good (0-50)	Minimal Impact	Poor (201-300)	Breathing discomfort to people on prolonged exposure
Satisfactory (51-100)	Minor breathing discomfort to sensitive people	Very Poor (301-400)	Respiratory illness to the people on prolonged exposure
Moderate (101-200)	Breathing discomfort to the people with lung, heart disease, children, and older adults	Severe (>401)	Respiratory effects even on healthy people

*Source:- CPCB AQI calculator

TABLE 3-11: AQI (IN $\mu\text{g}/\text{m}^3$) OF THE SAMPLING LOCATIONS

Sr.No.	Monitoring stations	PM10	PM2.5	SO ₂	NO ₂	CO	AQI value	AQI range
1	Project Site AA1	49.35	28.05	9.40	12.47	0.22	49	Satisfactory
2	Mohkampur Nawada AA2	45.63	26.23	13.89	14.13	0.64	46	Satisfactory
3	Kanhu Wala AA3	42.78	25.19	13.06	14.13	0.52	43	Satisfactory
4	Dhakrani AA4	43.58	25.71	09.88	14.33	0.46	44	Satisfactory
5	Manpur AA5	41.63	24.56	09.68	12.85	0.51	42	Satisfactory
6	Nawada AA6	40.76	22.01	08.63	13.63	0.36	41	Satisfactory
7	Shivpur AA7	48.57	27.41	09.52	14.06	0.45	49	Satisfactory
8	Dudhla AA8	44.27	24.68	09.18	13.78	0.52	44	Satisfactory

3.12.8 Observations of Results

PM₁₀: The maximum and minimum concentrations for PM₁₀ were recorded as 49.35 $\mu\text{g}/\text{m}^3$ and 27.34 $\mu\text{g}/\text{m}^3$ respectively. The maximum concentration was recorded at Project Site (AA1), and minimum concentration was recorded at Shiv Mandir at Adarsh Nagar-AA6. The average concentration ranged between 34.72 $\mu\text{g}/\text{m}^3$ and 41.77 $\mu\text{g}/\text{m}^3$.

PM_{2.5}: The maximum and minimum concentrations for PM_{2.5} were recorded as 28.05 $\mu\text{g}/\text{m}^3$ and 15.31 $\mu\text{g}/\text{m}^3$ respectively. The maximum concentration was recorded at Project Site (AA1), and minimum concentration was recorded at Shiv Mandir at Adarsh Nagar-AA6. The average concentrations ranged between 18.90 $\mu\text{g}/\text{m}^3$ and 22.49 $\mu\text{g}/\text{m}^3$.

SO₂: The maximum and minimum SO₂ concentrations were recorded as 13.89 $\mu\text{g}/\text{m}^3$ and 5.46 $\mu\text{g}/\text{m}^3$ respectively. The maximum & minimum concentrations were recorded at Shiv Bari Mandir Ambota(AA2) and minimum concentration was recorded at Shiv Mandir at Adarsh Nagar(AA6). The average values were observed to be 6.82 $\mu\text{g}/\text{m}^3$ to 10.56 $\mu\text{g}/\text{m}^3$.

NO₂: The maximum and minimum NO_x concentrations were recorded as 14.33 $\mu\text{g}/\text{m}^3$ and 9.06 $\mu\text{g}/\text{m}^3$. The maximum concentration was recorded at Ram Nagar (AA4) and minimum concentration was recorded at Project Site (AA1). The average values were observed to be in the range between 11.03 $\mu\text{g}/\text{m}^3$ to 12.70 $\mu\text{g}/\text{m}^3$.

CO: The maximum and minimum CO concentrations were recorded as 0.64 $\mu\text{g}/\text{m}^3$ and 0.09 $\mu\text{g}/\text{m}^3$. The maximum concentration was recorded at Shiv Bari Mandir Ambota (AA2) and minimum concentration was recorded at Ram Nagar (AA4). The average values were observed to be in the range between 0.0.19 $\mu\text{g}/\text{m}^3$ to 0.44 $\mu\text{g}/\text{m}^3$.

3.13 AMBIENT NOISE

As part of EIA study for the proposed project, Noise study was conducted by measuring the existing noise levels at various places around the site. The noise assessment was carried out with respect to the existing as well as the predicted noise that may come from the proposed project.

3.13.1 Noise level Monitoring Data

Noise level readings were recorded in eight locations spread over, in the 10-km radius centering the proposed unit. Noise levels were recorded using a digital noise level meter; the instrument was calibrated before and after each set of readings. The monitoring was carried out on a 24-hourly basis and the hourly Leq. Values were derived and reported.

TABLE 3-12 AMBIENT NOISE MONITORING LOCATION

Sr.No.	STATION NAME	DISTANCE (Km)	DIRECTION	Latitude & Longitude	Criteria
N1	Project Site	.....	.....	31.668367°, 76.082916°	Industrial
N2	Ram Mandir, Andora	0.86	SE	31.664436°, 76.093975°	Silence Zone
N3	Katohar Khurd Village Road	0.14	East	31.668181°, 76.085772°	Residential
N4	Ram Nagar	0.38	East	31.668862°, 76.088113°	Residential
N5	Jindbar	0.66	East	31.662372°, 76.089743°	Residential
N6	Gagret main Chowk	2.30	WSW	31.659475°, 76.061846°	Commercial Zone
N7	Kul Devi Mandir	2.34	WSW	31.659739°, 76.061480°	Silence Zone
N8	Gagret Bypass	1.28	SW	31.661034°, 76.073102°	Residential

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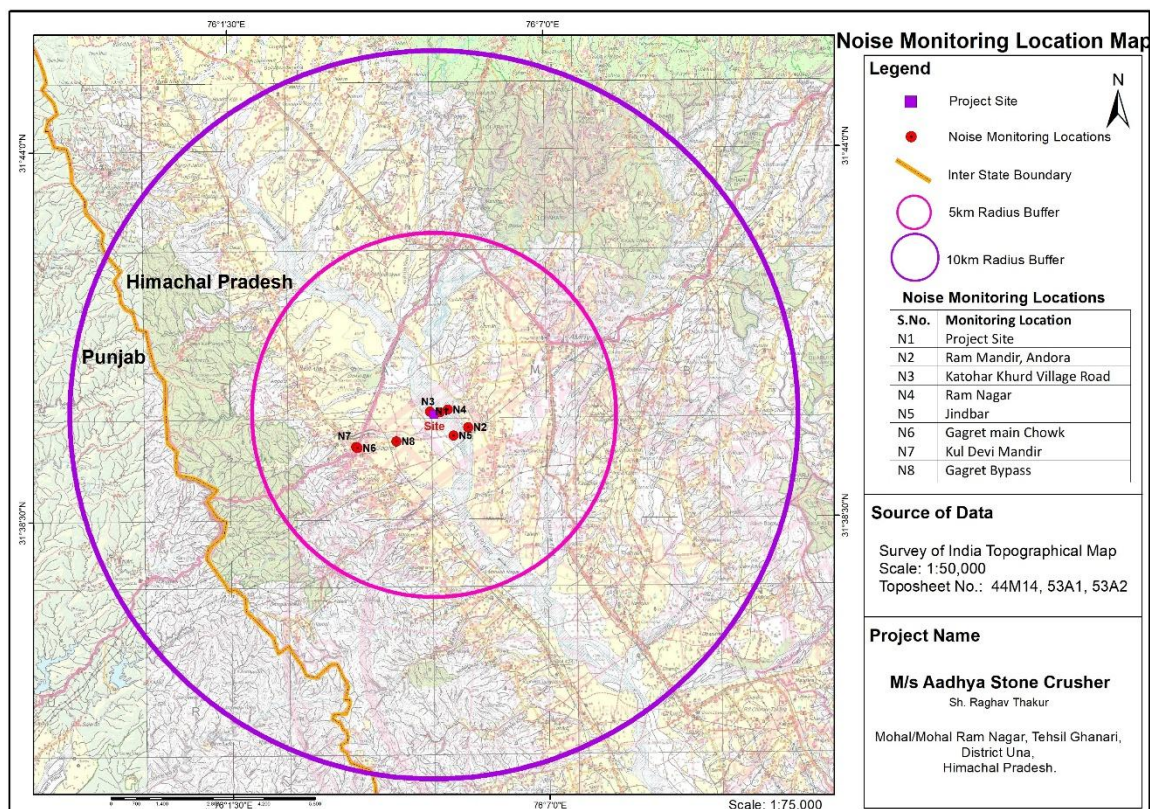


FIGURE 3-13: NOISE MONITORING LOCATIONS

TABLE 3-13 AMBIENT NOISE LEVEL OF STUDIED AREA

Sr.No.	Location Name	Results		Method
		Day Time Leq. dB (A)	Nighttime Leq.in dB(A)	
1.	Project Site	55.7	42.5	IS: 9989: 1981R-2002
2.	Ram Mandir, Andora	46.4	35.8	
3.	Katohar Khurd Village Road	52.5	40.6	
4.	Ram Nagar	53.1	42.2	
5.	Jindbar	52.3	44.0	
6.	Gagret main Chowk	47.6	35.1	
7.	Kul Devi Mandir	46.8	38.2	
8.	Gagret Bypass	52.4	43.9	

TABLE 3-14 AMBIENT NOISE QUALITY STANDARD (CPCB, 2009)

Area Code	Location Name	Day Time (6AM to 10PM db (A) Leg.	Nighttime (10PM to 6 AM db (A) Leg.
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zone	50	40

3.13.2 Result & Interpretation

Ambient noise levels were measured at eight locations around the mining site. Noise level varies from 46.4 to 55.7 dB (A) during daytime and during nighttime levels ranges from 38.2 to 44.0 dB (A). Thus, ambient noise levels at all locations were observed to be within the prescribed limits and well.

3.14 WATER ENVIRONMENT

3.14.1 Hydrogeology of the Area

Hydro-geologically, the unconsolidated valley fills or alluvial formations, occurring in the valley area and semi-consolidated sediments belonging to Shivalik Group form aquifer system in the district. Porous alluvial formation forms the most prolific aquifer system in the valley area, whereas the sedimentary semi-consolidated formation form aquifer of low yield prospect. The ground water in the Shivalik group of rocks occur under the unconfined to semi confined conditions, mainly in the arenaceous rocks viz., sandstone, siltstone, gravel boulder beds etc. The occurrence and movement of ground water is controlled by inter granular pore spaces and the fracture porosity. Shivalik sediments underlie Hilly/undulating areas, where springs (mostly gravity/contact type) and bowties are the main ground water structures apart from hand pumps. The discharges of the springs, varies from seepages to 0.50 lps. Bowries are dug well type constructions on the nalas for tapping the seepages. In the low-lying areas underlain by Shivalik rocks, dug wells and hand pumps are the main ground water structures, that range in depth from 3.00 to 25.00 m bgl, where in depth to water level ranges from 2.50 to 15.00 m bgl. In upland/plateau areas, the water level is generally deep. In Beet area water level is more than 60 m below land surface has been observed.

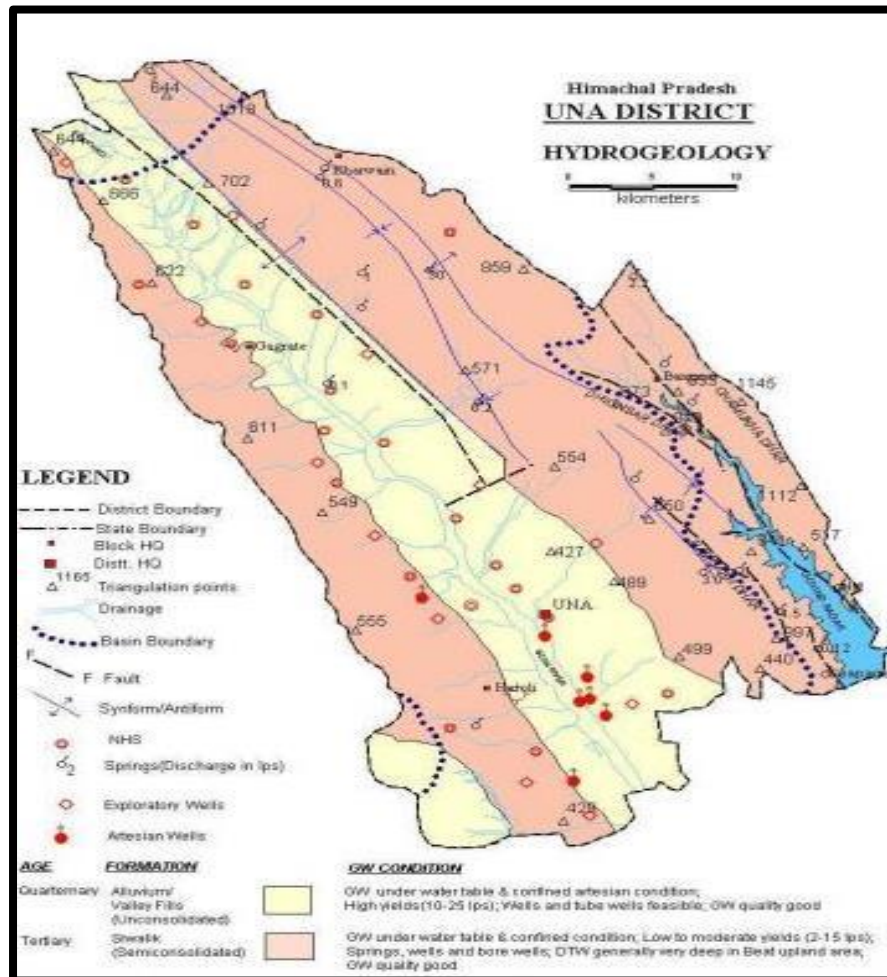


FIGURE 3-14: HYDROGEOLOGICAL MAP OF UNA DISTRICT

***Source:** - https://cgwb.gov.in/District_Profile/HP/UNA.pdf

3.14.2 Depth to Ground Water

As on March 2011, the stage of groundwater development in Una and Hum valleys of the district is 108% & 99% and falls under Critical category of development. There is thus no scope for further ground water development by constructing additional wells and tube wells in the valley area. However, tube wells can be constructed by tapping deeper aquifers of depth range of 300 m.

3.14.3 Water Quality in the study area

Chemical quality data of ground water from shallow as well as deep aquifers in the district, indicates that ground water is generally alkaline in nature and suitable both for domestic and irrigation use. All the parameters analyzed are well within the permissible limit of safe drinking water, set by Bureau of Indian Standard (BIS). Proper monitoring is very much required.

***Source:** http://cgwb.gov.in/District_Profile/HP/Una.pdf

3.14.4 Methodology for Ground Water Monitoring

Ground water samples were examined for physico-chemical & bacteriological parameters in order to assess effect of mining activities on surface and groundwater. The samples were collected and analyzed as per procedures specified in 'Standard Method for the Examination of Water and Wastewater' published by American Public Health Association (APHA). Samples for chemical analysis were collected in polyethylene carbons. Samples for bacteriological analysis were collected in sterilized glass bottles. Selected physico-chemical and bacteriological parameters have been analyzed for projecting the existing water quality status in the study area. Parameters like temperature, dissolved oxygen (DO) and pH were analyzed at the time of sample collection. To evaluate the physico-chemical characteristics of the water resources existing in the study area, water samples from surface and ground water sources were collected during the post-monsoon season and analyzed for physico-chemical parameters. Eight samples of water drawn from different sources (two surface water and Six ground water have been analyzed as per prescribed testing standards. Surface water and Ground water monitoring locations are shown in **Figure 3-15**.

1.12.2 Location of Sampling Stations

Six sampling stations covering ground and two surface waters were selected in the buffer zone of the study area is given in **Table 3-15**. The locations of water sampling stations have been shown in **Figure 3-15**.

TABLE 3-15: GROUND WATER & SURFACE WATER MONITORING LOCATIONS

GROUND WATER LOCATIONS				
Sr.No.	STATION NAME	DISTANCE (KM)	DIRECTION	LATITUDE & LONGITUDE
GW1	Bore Well at Shivpur Village U/s	2.10	NNW	31.686412°, 76.076569°
GW2	Bore Well at Ambota Village U/s	1.15	NW	31.675423°, 76.073824°
GW3	Tube well at Beli Village Site D/s	0.90	SSW	31.658801°, 76.081674°
GW4	Tube well at Kaloh Village D/s	2.78	South	31.642266°, 76.089807°
GW5	Bore Well at Jindwar Village	0.78	East	31.666707°, 76.093348°
GW6	Tube Well at Gagret Village	1.40	West	31.667769°, 76.068661°
SURFACE WATER LOCATIONS				
S.No.	STATION NAME	DISTANCE (KM)	DIRECTION	LATITUDE & LONGITUDE

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SW1	Ambota Village, U/s of mine lease (D/s of Industrial area)	0.40	NNW	31.670300°, 76.079136°
SW2	Gagret Village D/s	0.37	South	31.663258°, 76.085422°

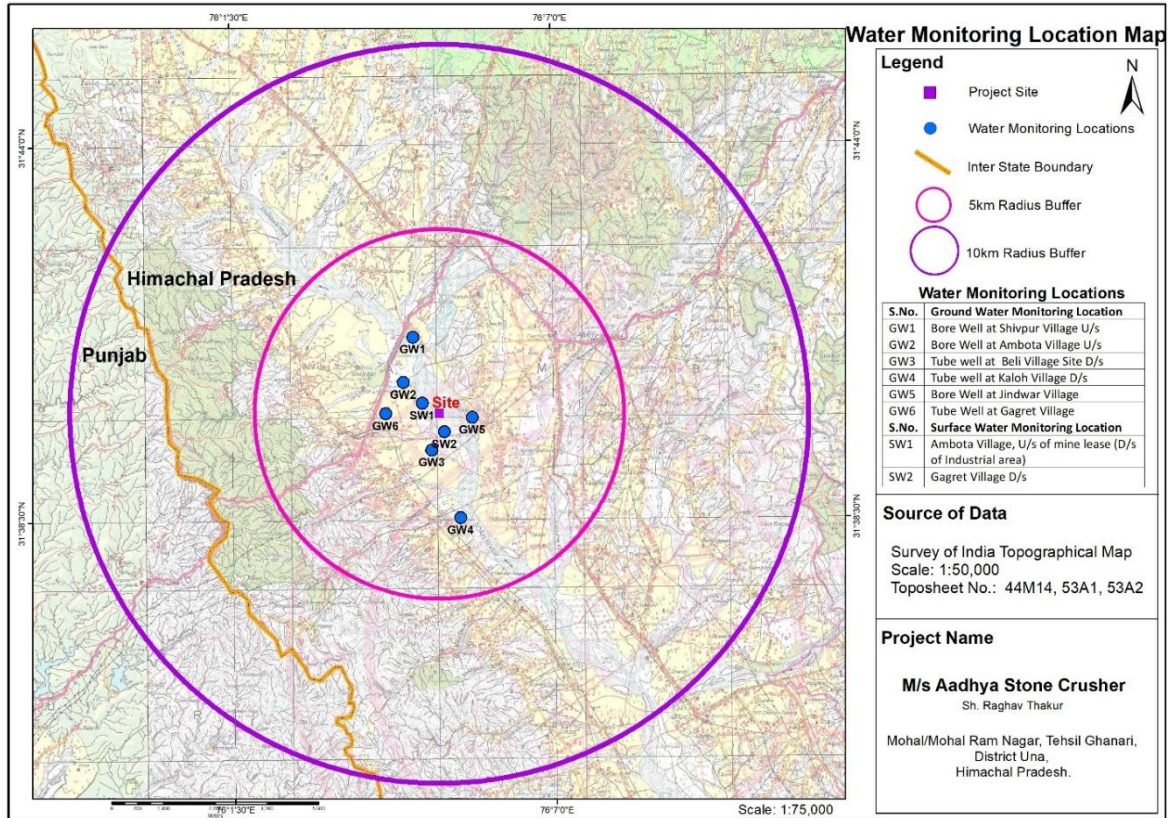


FIGURE 3-15: GROUND WATER & SURFACE WATER MONITORING LOCATIONS

TABLE 3-16 GROUND WATER TEST RESULTS

S. No.	Parameter	Unit	Limit (as per IS:10500)-2012/REV:-2023	GW1 Bore Well at Shivpur Village U/s	GW2 Bore Well at Ambota Village U/s	GW3 Tube Well at Beli Village D/s	GW4 Tube Well at Kaloh Village D/s	GW5 Bore Well at Jindwar Village D/s	GW6 Tube Well at Gagret Village D/s

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			Desira ble	Permi ssible						
1	Colour	Hazen	5	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2	Odour	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	Taste	-	Agreeable	-	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
4	Turbidity	NTU	1	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	pH	-	6.5-8.5	No Relaxation	7.40	7.42	7.55	7.78	7.56	7.64
6	Total Hardness (as CaCO ₃)	mg/l	200	600	161	158	142	136	146	176
7	Iron (as Fe)	mg/l	1.0	No Relaxation	0.08	0.11	0.105	0.07	0.06	0.09
8	Chlorides (as Cl)	mg/l	250	1000	12.5	14.8	15.6	12.4	15.5	16.0
9	Fluoride (as F)	mg/l	1	1.5	0.38	0.42	0.35	0.31	0.38	0.24
10	Conductivity	µmhos/cm	-	-	536.0	540.0	468.0	442.0	526.0	510.0
11	TDS	mg/l	500	2000	327.0	380.0	310.0	332.0	345.0	318.0
12	Calcium (as Ca ²⁺)	mg/l	75	200	65.4	62.8	66.0	64.1	65.0	65.5
13	Magnesium (as Mg ²⁺)	mg/l	30	100	12.5	16.0	10.2	14.7	15.8	12.4

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14	Copper (as Cu)	mg /l	0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
15	Manganese(as Mn)	mg /l	0.1	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
16	Sulphate (as SO ₄)	mg /l	200	400	28.0	26.6	25.4	23.8	27.6	30.0
17	Nitrate(as NO ₃)	mg /l	45	No Relaxation	3.20	2.75	3.10	3.96	3.11	3.54
18	Mercury (as Hg)	mg /l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Cadmium (as Cd)	mg /l	0.03	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Selenium (as Se)	mg /l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
21	Arsenic (as As)	mg /l	0.01	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
22	Cyanide (as CN)	mg /l	0.05	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
23	Lead (as Pb)	mg /l	0.1	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
24	Zinc (as Zn)	mg /l	5	15	0.132	0.116	0.125	0.110	0.111	0.128
25	Anionic Detergent (as MBAS)	mg /l	0.2	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
26	Chromium (as Cr ⁶⁺)	mg /l	0.05	No Relaxation	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
27	Mineral oil	mg /l	0.5	No Relaxation	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

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28	Alkalinity as Ca CO ₃	mg /l	200	600	182.0	176.0	162.0	149.0	154.0	165.0
28	Aluminium (as Al)	mg /l	0.03	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
29	Boron (as B)	mg /l	0.5	2.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
S. No.	Parameter	Limit (as per IS:10500)-2012/REV:-2023			Results	Results	Results	Results	Results	Results
1.	Total Coliform	MPN/100 ml	Absent/100 ml		Absent	Absent	Absent	Absent	Absent	Absent
2.	Escherichia coli (E-Coli)	MPN/100 ml	Absent/100 ml		Absent	Absent	Absent	Absent	Absent	Absent

3.14.5 Observations of the Results

All tested parameters were found to be within the permissible limits prescribed under IS:10500:2012/REV-2023 for drinking water quality. The pH values ranged between 7.40 and 7.78, indicating neutral to slightly alkaline conditions. Total Dissolved Solids (TDS) were recorded between 310 and 380 mg/l, well below the desirable limit of 500 mg/l.

Heavy metals such as iron, lead, cadmium, arsenic, mercury, and chromium were either absent or present in negligible concentrations, confirming that groundwater is free from contamination due to natural formations or industrial activities. Toxic substances like cyanide and mercury were not detected. Overall, the groundwater quality in the study area is safe for drinking purposes, with no evidence of pollution or toxicity.

TABLE 3-17: SURFACE WATER TEST RESULTS

Sr. No	Parameter	Test Method	Units	SW1-Ambota Village U/s of mine lease & D/s of Industrial Area	SW2-Gagret Village D/s

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1.	pH (at 25°C)	IS:3025(Part-11)	---	7.25	7.37
2.	Temperature	IS:3025(Part-9)	0C	21.0	24.0
3.	Turbidity	IS:3025(Part-10)	NTU	2.5	4.4
4.	Electric Conductivity @25°C	IS:3025(Part-14)	mg/l	326	480
5.	Sulphate (SO ₄)	IS:3025(Part-24)	mg/l	15.8	26.4
6.	Nitrate (NO ₃)	IS:3025(Part-34)	mg/l	3.2	4.5
7.	Total Hardness (as CaCO ₃)	IS:3025(Part-21)	mg/l	165	178
8.	Chloride (as Cl)	IS:3025(Part-32)	mg/l	41.2	54.8
9.	Fluoride (as F)	APHA 4500F	mg/l	0.23	0.35
10.	COD (as O ₂)	APHA-5220 B	mg/l	23	38
11.	Iron (as Fe)	IS:3025(Part-53)	mg/l	0.21	0.26
12.	Dissolve Oxygen	IS-3025(Part-38)	mg/l	7.2	6.8
13.	Total Dissolved Solid	IS:3025(Part-16)	mg/l	198	212
14.	BOD (3 days at 270C)	IS:3025 (P-44)	mg/l	4.5	7.8
15.	Calcium (as Ca)	IS:3025(Part-40)	mg/l	65.4	72.8
16.	Magnesium (as Mg)	IS:3025(Part-46)	mg/l	12.8	15.4
17.	Arsenic (as As)	IS:3025(Part-37)	mg/l	BDL (<0.01)	BDL (<0.01)
18.	Lead (as Pb)	IS:3025(Part-47)	mg/l	BDL (<0.01)	BDL (<0.01)
19.	Copper (as Cu)	IS:3025(Part-42)	mg/l	BDL (<0.05)	BDL (<0.05)
20.	Zinc (as Zn)	IS:3025(Part-49)	mg/l	BDL (<0.01)	BDL (<0.01)
21.	Manganese (as Mn)	IS:3025(Part-59)	mg/l	BDL (<0.10)	BDL (<0.10)
22.	Total Chromium (as Cr)	IS:3025(Part-52)	mg/l	BDL (<0.05)	BDL (<0.05)
23.	Sodium (as Na)	IS:3025(Part-45)	mg/l	25.0	32.0
24.	Potassium (as K)	IS:3025(Part-45)	mg/l	1.46	1.98

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25.	Total Alkalinity (as CaCO ₃)	IS:3025(Part-23)	mg/l	182	187
26.	Phosphate (as P)	IS:3025(Part-31)	mg/l	0.23	0.28
27.	Nitrogen	IS: 3025 (P- 34)	mg/l	0.14	0.20
28.	Total Suspended Solid	IS:3025(Part-17)	mg/l	7.6	8.5
29.	Total Coliform	APHA 24 th Edition	MPN /100 ml	3.4*10 ³	4.1*10 ³
30.	Faecal Coliform	APHA 24 th Edition	MPN /100 ml	1.0*10 ³	1.6*10 ³

3.14.6 Result & Interpretation of Surface water

The analysis of surface water samples collected from the study area was compared with the prescribed standard limits under the Environment Protection Rules, 1986. The pH values were found to be in the range of 7.25–7.37, indicating neutral conditions. Total Dissolved Solids (TDS) ranged between 198–212 mg/l, which is well within acceptable limits. Other physico-chemical parameters such as turbidity, hardness, alkalinity, sulphate, nitrate, chloride, calcium, magnesium, sodium, potassium, and phosphate were observed within permissible levels. Lab Report of the same has been attached as **Annexure-XI**.

Organic load indicators (COD: 23–38 mg/l, BOD: 4.5–7.8 mg/l) suggest moderate organic content, while Dissolved Oxygen (DO) levels (6.8–7.2 mg/l) remain adequate to support aquatic life. Trace elements including arsenic, lead, copper, zinc, manganese, and chromium were either within limits or below detectable levels.

Microbiological analysis showed total coliform counts of 3.4×10^3 – 4.1×10^3 MPN/100 ml and Faecal coliform counts of 1.0×10^3 – 1.6×10^3 MPN/100 ml, indicating some microbial presence typical of riverine systems.

Overall, the surface water quality in the study area is within the prescribed standards. Physico-chemical parameters and trace elements are either within permissible limits or below detection levels, with only moderate microbial contamination observed.

The analysis report of the water sample collected from the different surface water sources (River) in study area show that the water is used for the domestic purposes but only after conventional treatment & disinfection. As per the analysis the class of water is “C” as per the CPCB’s water quality criteria for designated best use.

**Test report is attached as ANNEXURE- XI.*

The surface water quality comparison with CPCB water quality criteria is given below:-

TABLE 3-18: CPCB WATER QUALITY CRITERIA

Designated-Best-Use	Class of water	Criteria
Drinking water source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less. PH between 6.5 and 8.5. Dissolved Oxygen 6mg/l or more
Outside bathing (organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less. PH between 6.5 and 8.5. Dissolved Oxygen 6mg/l or more
Drinking water source after conventional treatment and disinfection	C	Total coliform organism MNP/100ml shall be 5000 or less. PH between 6 to 9 Dissolved Oxygen 4mg/l or more
Propagation of Wildlife and fisheries	D	PH between 6.5 and 8.5. Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled waste disposal	E	PH between 6.0 and 8.5. Electrical conductivity at 25°C micro mhos/cm Max. 2250. Sodium absorption ratio 26 Boron Max. 2kg/cm
	Below-E	Not meeting A, B, C, D and E criteria

3.15 TRAFFIC DENSITY

Traffic density measurements were performed at three locations. The mining lease area is located in the riverbed of River Swan beside the village Ramnagar and is approachable through the left bank of Swan River diverting RHS road from Andora-Ghanariat village Andora. The mining site is located in the Swan River and about 34 kilometers from Una. The Monitoring was performed during the study period. The results of traffic Increase due to project activity are given in **Table 3-20**.

3.15.1 Methodology

Traffic density measurement was made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. Two skilled persons were deployed simultaneously at each station during each shift- one person on each of the two directions for counting the traffic. At the end of each hour, fresh counting and recording was undertaken. Total numbers of vehicles per hour under three categories were determined.

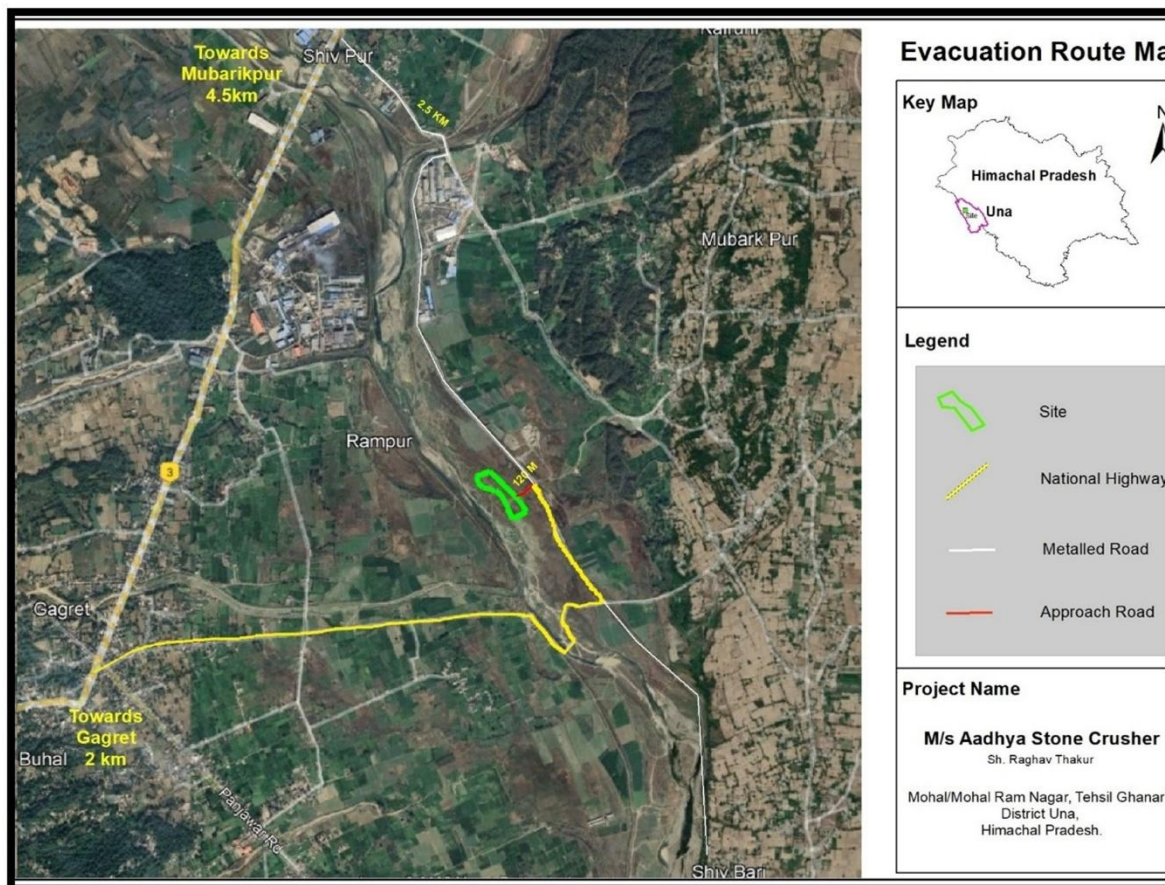


FIGURE 3-16:- TRAFFIC STUDY LOCATION

TABLE 3-19: EXISTING TRAFFIC SCENARIO & LOS

Location	Road	V	C	Existing V/C Ratio	LOS
A	Old Amb Road	300	1400	0.21	B
B	Panjawar Road	480	1900	0.25	B
C	NH-70	1400	5800	0.24	B

*Source: Capacity as per IRC: 64-1990

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

The existing Level of Service (LOS) is "A" i.e., excellent.

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

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

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

Traffic density during mining operation

Total Production : 65700 TPA
 No. of working days : 270 Days
 Per day capacity of mine : 243tonnes/day
 Trolley/Truck capacity : 9 tonnes
 No. of trip deployed : 27 trips/day
 Working hours per days : 8 hours
 No. of trucks deployed/h : Approx. 3 trucks/tractor trolley.

***Increase in PCU/day will be 18.85 PCUs**

TABLE 3-20: TRAFFIC INCREASE DUE TO PROJECT ACTIVITY

Sr. No.	Type of Vehicle	Additional Vehicle Distribution/day	PCU	Total No. of Vehicles in PCU/day	No. of Vehicles in PCU/hr.
1	Cars	4	1	4.00	0.50
2	Trucks	3	3.7	11.10	1.39
3	Two Wheelers	5	0.75	3.75	0.47
Total		15	.....	18.85	2.36

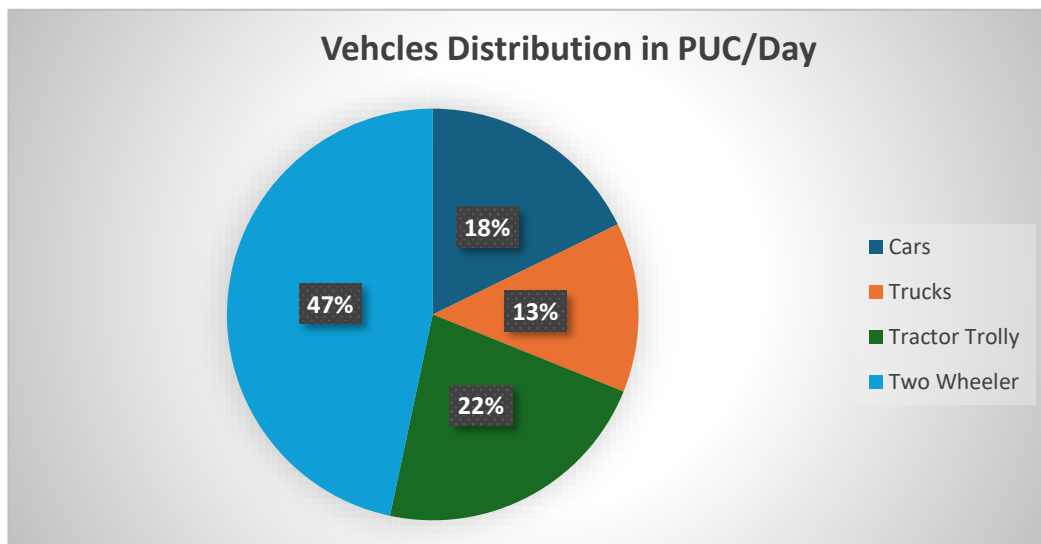


FIGURE 3-17 GRAPHICAL REPRESENTATION OF VEHICLES

TABLE 3-21: MODIFIED TRAFFIC SCENARIO & LOS

Location	Road	Increase PUC	V	C	Existing V/C Ratio	LOS
A	Old Amb Road	300+19	319	1400	0.23	B
B	Panjawar Road	480+19	499	1900	0.26	B
C	NH-70	1400+19	1419	5800	0.24	B

3.15.2 Results of traffic assessment

From the traffic study it is observed that there is not much load on the existing Village Road Old Amb Road to Panjawar road and National Highway (NH-70). Therefore, the additional load on the carrying capacity of the concerned roads is not likely to have any adverse effect on the LOS. The modified Level of Service (LOS) assessment indicates that the Village Road from Old Amb Road to Panjawar Road is in Good condition, while the National Highway (NH-70) is also assessed to be in Very Good condition.

3.16 BIOLOGICAL ENVIRONMENT

The term biological environment would cover the prevalence of all living forms such as plants and animals both in terrestrial and aquatic in the study area. Living forms cover a very wide spectrum of species and even a small area may have thousands of species if all bacteria, protozoa, worms, insects, plants, animals, and birds are to be included. In the present study, higher taxa (trees, small trees, shrubs, under shrubs, climbers, and grasses) and fauna (mammals, birds, and aquatic) are covered. The Study area for the proposed project is of 10 km for the study of Biological Environment.

The basic purpose to exploring the biological environment under Environmental Impact Assessment (EIA) is to assist in the decision-making process and to ensure that the project options under consideration are bio-environmental-friendly. EIA identifies ways of improving project environmentally by preventing, minimizing, mitigating, or compensating for adverse impacts before construction and after construction phase. The present study on the floral assessment of the proposed project is based on field survey of the area supported by secondary data from various governmental and non-governmental source.

3.17 OBJECTIVES OF ECOLOGICAL AND BIODIVERSITY STUDIES

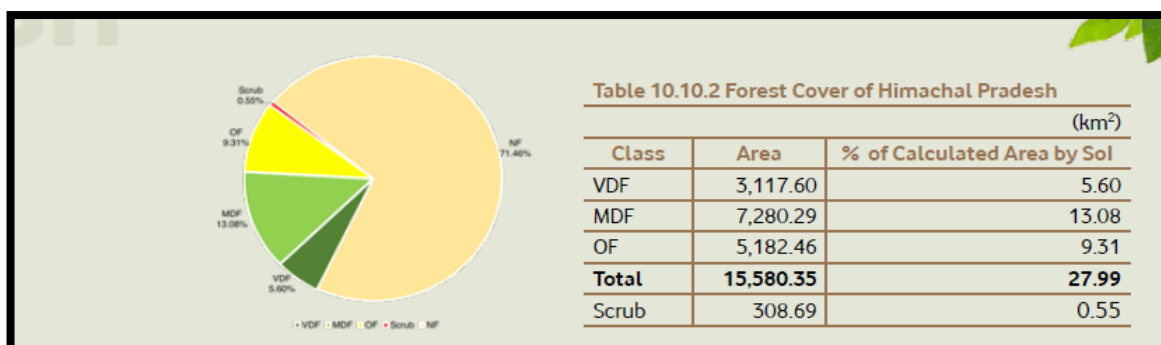
The objective of the present study was undertaken with a view to understand the present ecosystem on the following lines:-

- To assess the distribution of vegetation in the area.
- To assess the distribution of faunal life in the areas; and
- To assess the biodiversity resource potential.

3.18 EXISTING FOREST IN THE STUDY AREA

The Forest Cover in the State is 15,580.35 sq. km which is 27.99 % of the State's geographical area. In terms of forest canopy density classes, the State has 3117.60 sq. km under Very Dense Forest (VDF), 7,280.29 sq. km under Moderately Dense Forest (MDF) and 5,182.46 sq. km under Open Forest (OF).

The Forest Cover in district Una is 639.84 sq. Km which is 41.55 % of Geographical Area.



*(Source: ISFR 2023, Forest Survey of India, MoEF & CC)

TABLE 3-22 DISTRICT WISE FOREST COVER IN HIMACHAL PRADESH

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District	Calculated Area by Sol	2023 Assessment				% of Cal- culated Area by Sol	Change w.r.t. 2021 Raster based*	Scrub
		Very Dense Forest	Mod. Dense Forest	Open Forest	Total			
Bilaspur ^h	1,167	22.65	165.85	185.30	373.80	32.03	2.12	3.30
Chamba ^h	6,522	596.72	1,221.92	637.51	2,456.15	37.66	-1.82	21.27
Hamirpur ^h	1,118	42.41	101.95	217.17	361.53	32.34	0.00	12.40
Kangra ^h	5,739	229.24	1,301.44	869.52	2,400.20	41.82	5.70	12.81
Kinnaur ^h	6,401	84.24	325.72	238.11	648.07	10.12	-0.51	61.34
Kullu ^h	5,503	634.95	852.20	508.21	1,995.36	36.26	0.22	25.02
Lahaul & Spiti ^h	13,841	11.95	34.03	100.03	146.01	1.05	0.17	16.69
Mandi ^h	3,950	412.59	730.22	647.36	1,790.17	45.32	9.11	18.67
Shimla ^h	5,131	778.96	1,150.66	514.97	2,444.59	47.64	4.22	28.29
Sirmaur ^h	2,825	238.40	646.70	530.78	1,415.88	50.12	20.46	49.60
Solan ^h	1,936	45.84	439.72	423.19	908.75	46.94	12.08	46.55
Una ^h	1,540	19.65	309.88	310.31	639.84	41.55	2.98	12.75
Grand Total	55,673	3,117.60	7,280.29	5,182.46	15,580.35	27.99	54.73	308.69

*(Source:- ISFR 2023, Forest Survey of India, MoEF & CC)

3.18.1 Forests Cover in Una District

Northern Dry Mixed Deciduous Forest (5B/C2):- This type is characterized by the presence of Anogeissus latifolia, Acacia catechu on the upper dry Southern slopes and outer extensions of Siwaliks, mainly in the transition between dry to moist deciduous type. The upper canopy is light but fairly even and continuous in the climax form. Climax formations are rarely encountered, and mostly irregular, often broken canopy is seen. The mean annual temperature ranges from 24°C to 27°C and rainfall ranges from 900mm to 1,500 mm.

Dry Siwalik Sal Forest(5B/C1a):- This type is characterized by the prevalence of Sal of low quality mixed other deciduous species of height rarely above 18m forming irregular canopy. An undergrowth of grass is usual. The soil is derived from Siwalik sand rock and conglomerates and is shallow sandy and completely drained.

Dry deciduous Scrub (5/DS1):- This Type occurs throughout the dry deciduous forest zone and is stunted condition of tree growth. Usually it occupies stony sites, where fleshy Euphorbia spp. is the most important constituent. The thorny Acacia Species and their associates also occur but are usually stunted. Soil is bare, rocky with thin cover of wiry grasses.

Dry bamboo brakes(5/E9):- In this type only one species, Dendracalamus strictus is found and forms relatively low but often dense brakes. Generally, this type occurs on well drained and loose

textured Siwalik formations mainly on dry hill sides. A scattered over wood of hardier species of the dry deciduous forest indicates the dominance of bamboo to be secondary.

Lower or Siwalik Chir pine forest(9/C1a):- In this type of forest, *Pinus roxburghii* occurs pure or in the mixed forms with a Scattered lower deciduous tree storey. These forests occur between the elevations of 800m to 1700 m. At lower elevations, it is restricted to the cooler Northern and sheltered aspects while on higher elevations, it is restricted to the cooler Northern and sheltered aspects while on higher elevations it occurs all over, preferably on the ridges.

3.19 METHODOLOGY ADOPTED FOR THE BIOLOGICAL SURVEY

Detailed study of the area was undertaken within 10-km radius study area from the proposed Project. The different methods adopted for biological study were as follows:-

- ❖ Collection and compilation of secondary data with respect to the study area from published literature and Government agencies.
- ❖ Generation of primary data by undertaking site visits and systematic ecological studies in the area; and
- ❖ Interaction with local people to elicit information for local plants, animals, and their uses.

Biological studies in the study area were conducted during January-2026.

3.19.1 METHODOLOGY

The primary objective of the survey is to describe the floral and faunal communities within the study area. The knowledge of species, habitats requirement, soil type, terrain, vegetation etc. were used to predict species occurrence. This Rapid biodiversity assessment was undertaken by

identifying potentially rich sites from satellite imagery LISS-IV and Google Earth and conducting the field survey in potential habitats. GPS (Garmin e-trex-20) was used for locating field samples as well as gathering positional attributes of flora and faunal species.

The methodology adopted for faunal survey involved faunal habitat assessment, random intensive survey, opportunistic observations, diurnal bird observation, active search for reptiles, active search for scats and footprints and review of previous studies. The aim was to set baselines to monitor and identify trends after the commencement of production system activity. Emphasis has been placed on the presence of rare, endemic, migratory, and threatened species, if any present in the study area. Desktop literature review was conducted to identify the representative spectrum of threatened species, population and ecological communities as listed by IUCN and in Indian wildlife Protection act, 1972 amended in 2022. The status of individual species was assessed using the revised IUCN category system.

3.19.1.1 Field study period

The ecological survey has been conducted for one season. The details are given below in the table below.

Post-monsoon :- January to March-2026

Core zone :- At the project site.

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

TABLE 3-23: MODE OF DATA COLLECTION & PARAMETERS CONSIDERED DURING THE SURVEY

Aspect	Mode of data collection	Parameters Monitored	Frequency	Source(s)
Terrestrial Ecology	Primary field survey and secondary literature survey	Floral and Faunal Diversity and their Importance	One Season (Winter)	Field studies, Forest & Wildlife Department, and literature review
Aquatic Ecology	Primary field survey and secondary literature survey	Diversity of Species and their Importance	One Season (Winter)	Field studies, Forest/ Wildlife Department, and literature review

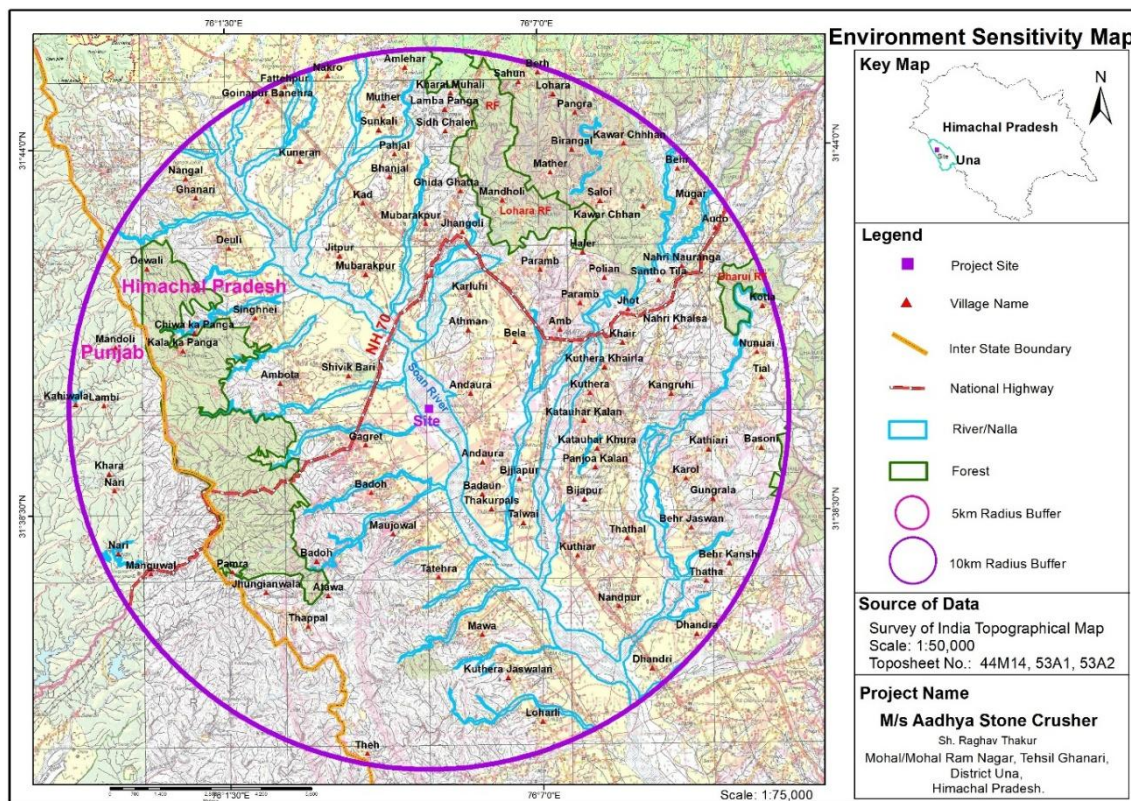


FIGURE 3-18: ENVIRONMENTAL SENSITIVITY MAP WITHIN 5 KM AND 10 KM RADIUS

Ecological Pattern:- The project site (core zone) as well as buffer zone area were surveyed to assess the ecological status. The present study was carried out separately for floral and faunal community.

Flora

For studying flora of the area, Himachal Pradesh report on trees was consulted. Photographs were taken when plants are not identified for further search. Unidentified shrubs were collected following proper procedure and prepared into herbarium sheets for later identification.

3.19.2 Diversity Index

The Shannon-Wiener diversity index is one measure that to draw information from samples in the field. Historically, the index has been used to measure the effects of habitat quality such as effects of pollution of the area. The results of the Shannon-Wiener index need to be used with caution; it helps in comparing distinct habitats. It combines two quantifiable measures: the species richness (number of species within the community) and species equitability (how even are the numbers of individual species).

There is no Eco-sensitive zone located within 10 km periphery. The sampling points are depicted as EB-1, EB-2 EB-3 and EB-4 based on the maximum probable diversity within the study area. Details of sampling locations for floral studies are given in table below.

TABLE 3-24: DETAILS OF SAMPLING LOCATIONS FOR FLORAL STUDIES

Sr.No.	Area Code	Area Range (Km)	Distance and Direction from project site
1	EB-1	0-3	About 2.70 km in NNE direction.
2	EB-2	3-7	About 3.03 km in S direction.
3	EB-3	3-7	About 4.70 km in E direction.
4	EB-4	3-7	About 5.95 km in NW direction.

Google image showing sampling locations for floral studies is given in figure below :-

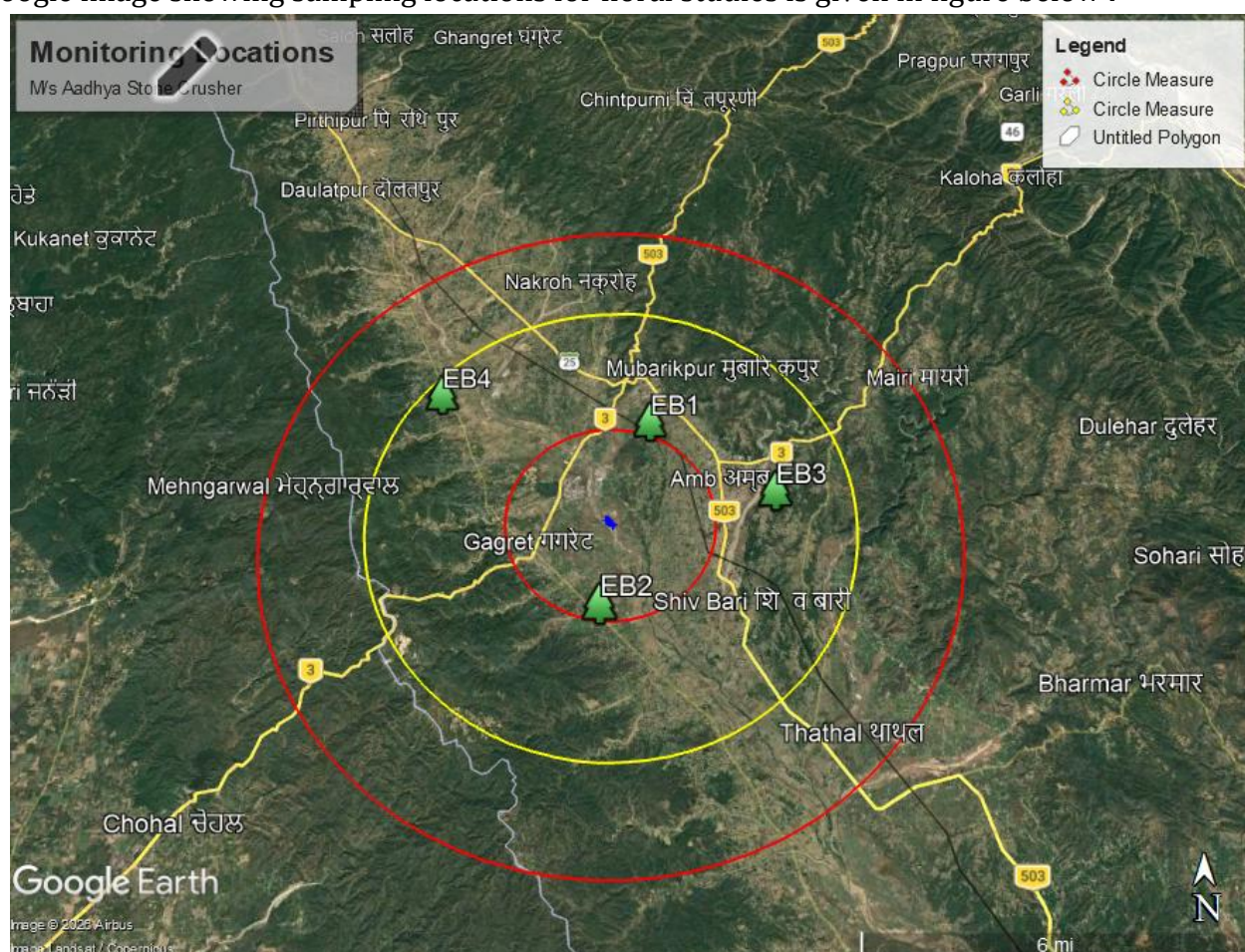


FIGURE 3-19: SAMPLING LOCATIONS FOR FLORAL STUDY

Shannon Wiener Diversity Index:- $H = - \sum P_i(\ln P_i)$, where P_i is the proportion of each species in the sample. The value ranges between 1 to 6. Lower values <1 indicate less diversity, values between 1 to 3 indicate medium diversity and values >3 indicate higher diversity.

Calculations:-

The Shannon-Wiener Diversity Index, H, is calculated using the following equation: $H = - \sum (P_i \ln P_i)$ where P_i is the proportion of each species in the sample.

TABLE 3-25: DISTRIBUTION OF SPECIES

Sr. No	Species	Frequency	Pi	ln(Pi)	Pi*ln(Pi)
	EB-1				
1.	Acacia catechu	40	0.190	-1.658	-0.316
2.	Adhatoda vasica	20	0.095	-2.351	-0.224
3.	Bauhinia variegata	30	0.143	-1.946	-0.278
4.	Brassica campestris	30	0.143	-1.946	-0.278
5.	Dalbergia sissoo	30	0.143	-1.946	-0.278
6.	Oryza sativa	60	0.286	-1.253	-0.358
Total		210			-1.732
	EB-2				
1.	Acacia catechu	50	0.227	-1.482	-0.337
2.	Azadirachta indica	30	0.136	-1.992	-0.272
3.	Bombax ceiba	40	0.182	-1.705	-0.310
4.	Brassica campestris	20	0.091	-2.398	-0.218
5.	Eucalyptus tereticornis	40	0.182	-1.705	-0.310
6.	Mangifera indica	40	0.182	-1.705	-0.310
Total		220			-1.756
	EB-3				
1.	Aegle marmelos	30	0.143	-1.946	-0.278
2.	Albizia lebbeck	40	0.190	-1.658	-0.316
3.	Dendrocalamus strictus	20	0.095	-2.351	-0.224
4.	Ficus benghalensis	30	0.143	-1.946	-0.278
5.	Syzygium cumini	40	0.190	-1.658	-0.316
6.	Ziziphus jujuba	50	0.238	-1.435	-0.342
Total		210			-1.753
	EB-4				
1.	Albizia lebbeck	20	0.100	-2.303	-0.230
2.	Azadirachta indica	40	0.200	-1.609	-0.322
3.	Bauhinia variegata	30	0.150	-1.897	-0.285

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4.	Carissa carandas	20	0.100	2.303	-0.230
5.	Eucalyptus tereticornis	40	0.200	-1.609	-0.322
6.	Mangifera indica	50	0.250	-1.386	-0.347
Total		200			-1.735

At location EB1 Diversity Index H is 1.732

The SW index values (H) can range of 0 to ~4.6 using the natural log (ln). A value near 0 would indicate that every species in the sample is the same. A value near 4.6 would indicate that the number of individuals is evenly distributed between all the species. Here, the value of H is 1.732, that indicates the area is lightly diversified.

At location EB2 Diversity Index H is 1.756

The SW index values (H) can range of 0 to ~4.6 using the natural log (ln). A value near 0 would indicate that every species in the sample is the same. A value near 4.6 would indicate that the number of individuals is evenly distributed between all the species. Here, the value of H is 1.756, that indicates the area is lightly diversified.

At location EB3 Diversity Index H is 1.753

The SW index values (H) can range of 0 to ~4.6 using the natural log (ln). A value near 0 would indicate that every species in the sample is the same. A value near 4.6 would indicate that the number of individuals is evenly distributed between all the species. Here, the value of H is 1.753, that indicates the area is lightly diversified.

At location EB4 Diversity Index H is 1.735

SW index values (H) can range of 0 to ~4.6 using the natural log (ln). A value near 0 would indicate that every species in the sample is the same. A value near 4.6 would indicate that the number of individuals is evenly distributed between all the species. Here, the value of H is 1.735 that indicates the area is lightly diversified. A list of flora of the study area is enclosed as Table below:-

TABLE 3-26: FLORA IN THE STUDY AREA (CORE ZONE & BUFFER ZONE)

S.No.	Species	Family	Habit	Source
1.	<i>Acacia catechu (Khair)</i>	Fabaceae	Tree	P
2.	<i>Adhatoda vasica (Arusa)</i>	Acanthaceae	Shrub	P
3.	<i>Aegle marmelos (Bael)</i>	Rutaceae	Tree	S
4.	<i>Albizia lebbeck (Siris)</i>	Fabaceae	Tree	S
5.	<i>Azadirachta indica (Neem)</i>	Meliaceae	Tree	S
6.	<i>Bauhinia variegata (Kachnar)</i>	Fabaceae	Tree	S
7.	<i>Bombax ceiba (Semal)</i>	Malvaceae	Tree	P

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8.	<i>Brassica campestris (Mustard)</i>	Brassicaceae	Herb (crop)	P
9.	<i>Calotropis procera (Aak)</i>	Apocynaceae	Shrub	P
10.	<i>Carissa carandas (Karonda)</i>	Apocynaceae	Shrub	S
11.	<i>Dalbergia sissoo (Shisham)</i>	Fabaceae	Tree	S
12.	<i>Dendrocalamus strictus (Bamboo)</i>	Poaceae	Clumping grass	P
13.	<i>Eucalyptus tereticornis (Safeda)</i>	Myrtaceae	Tree	P
14.	<i>Ficus benghalensis (Banyan)</i>	Moraceae	Tree	P
15.	<i>Ficus religiosa (Peepal)</i>	Moraceae	Tree	P
16.	<i>Mangifera indica (Mango)</i>	Anacardiaceae	Tree	P
17.	<i>Morus alba (Mulberry)</i>	Moraceae	Tree	S
18.	<i>Oryza sativa (Rice)</i>	Poaceae	Herb	S
19.	<i>Phoenix sylvestris (Wild Date Palm)</i>	Arecaceae	Tree	P
20.	<i>Pinus roxburghii (Chir Pine)</i>	Pinaceae	Tree	P
21.	<i>Saccharum officinarum (Sugarcane)</i>	Poaceae	Herb (crop)	S
22.	<i>Shorea robusta (Sal)</i>	Dipterocarpaceae	Tree	S
23.	<i>Syzygium cumini (Jamun)</i>	Myrtaceae	Tree	P
24.	<i>Terminalia arjuna (Arjun)</i>	Combretaceae	Tree	P
25.	<i>Triticum aestivum (Wheat)</i>	Poaceae	Herb (crop)	S
26.	<i>Ziziphus jujuba (Ber)</i>	Rhamnaceae	Shrub/Small	S

Note: T=Tree, S=Shrub, C: Climber, H=Herb,

Source: Field Studies by SSWML and Secondary Data,

P* Primary source,

S* Secondary source

3.20 FAUNAL DIVERSITY OF THE STUDY AREA

Faunal survey was conducted during the study period. The mammals in the area were enlisted by information's local people along the survey area. The Faunal population in the area is composed mainly of domesticate animals like, Cows, Buffalos, Dogs, etc. however, there are reports of Weasel, Civets, Squirrel, Foxes and Rabbits in the area. The fauna of the study area is grouped into aquatic and terrestrial as the core area mostly comprises of aquatic fauna and the buffer area provides shelter to the terrestrial animals.

Aquatic fauna:- Aquatic fauna mostly comprises of Amphibians, Molluscs & Fish which cannot survive without water. The aquatic fauna of the project site is given as below:-

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

3.20.1 Terrestrial Fauna:-

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

Avifauna: - Avifauna: Water birds like Gadwall (*Anas strepera*), Common teal (*Anas crecca*), White throated kingfisher (*Halcyon smyrnensis*), Pied kingfisher (*Ceryle rudis*), Red wattled lapwing etc. are noticed. House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Common hill Myna (*Gracula religiosa*), Red-rumped Swallow (*Cecropis daurica*), Hoopoe (*Upupa epops ceylonensis*) are common occurrences.

Reptiles:-The reptilian's species commonly reported are Agama (*Laudakia tuberculata*) in settlement area, Garden lizard (*Calotes versicolor*) and *Eutropis macularia* along shady places in agricultural field or where growth of bushes is noticed. Among non-poisonous snakes rat snakes (*Ptyas mucosus*) are commonly noticed in field, followed by poisonous snakes like Cobra (*Naja naja*) and Banded krait (*Bungarus multicinctus*) are reported to be seen by farmers farmers.

TABLE 3-27:- LIST OF FAUNA IN THE CORE ZONE AND BUFFER ZONE

S.No.	Common Name	Scientific name	Wildlife Schedule	IUCN Category	Red
Domestic Animals:					
1	Cow	<i>Bos indicus</i>	Not listed	NA	
2	Buffalo	<i>Bos bubalis</i>	Not listed	NA	
3	Goat	<i>Capra aegagrus hircus</i>	Not listed	NA	
4	Sheep	<i>Ovis aries</i>	Not listed	NA	
Wild Animals (Mammals)					
1.	Chital / Spotted Deer	<i>Axis axis</i>	III	LC	
2.	Barking Deer	<i>Muntiacus muntjak</i>	III	LC	
3.	Wild Boar	<i>Sus scrofa</i>	III	LC	
4.	Golden Jackal	<i>Canis aureus</i>	II	LC	
5.	Indian Grey Mongoose	<i>Herpestes edwardsii</i>	II	LC	
Avian flora (Birds):					
	Jungle Myna	<i>Acridotheres fuscus</i>	-	LC	
	Common Myna	<i>Acridotheres tristis</i>	II	LC	
	Pintail (Duck)	<i>Anas acuta</i>	-	LC	

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Common Teal	<i>Anas crecca</i>	II	LC
Mallard (wild duck)	<i>Anas platyrhynchos</i>	-	LC
Spotted Owlet	<i>Athene brama</i>	-	LC
Cattle Egret	<i>Bubulcus ibis</i>	II	LC
Red-rumped Swallow	<i>Cecropis daurica</i>	II	DD
Pied kingfisher	<i>Ceryle rudis</i>	II	DD
Blue Rock Pigeon	<i>Columba livia</i>	-	LC
Oriental Magpie Robin	<i>Copsychus saularis</i>	II	LC
Indian roller	<i>Coracias benghalensis</i>	-	LC
House Crow	<i>Corvus splendens</i>	-	LC
Common Cuckoo	<i>Cuculus canorus</i>	II	LC
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	-	LC
Asian Koel	<i>Eudynamis scolopacea</i>	-	NA
White-breasted King fisher	<i>Halcyon smyrnensis</i>	-	LC
Small Green Bee Eater	<i>Merops orientalis</i>	II	LC
House Sparrow	<i>Passer domesticus</i>	II	LC
Rose ringed Parakeet	<i>Psittacula krameri</i>	II	LC
Red vented Bulbul	<i>Pycnonotus cafer</i>	-	LC
Spotted Dove	<i>Streptopelia chinensis</i>	II	NA
Marsh Sandpiper	<i>Tringa stagnatilis</i>	II	LC
Common Babbler	<i>Turdoides caudatus</i>	-	NA
Hoopoe	<i>Upupa epops ceylonensis</i>	-	NA
Reptiles & Amphibians			
Common Toad	<i>Bufo melanostictus</i>	-	LC
Skipping frog	<i>Bufo stomaticus</i>	-	LC
Krait	<i>Bungarus caeruleus</i>	-	NA
Banded krait	<i>Bungarus multicinctus</i>	-	NA
Kashmir Rock Agama	<i>Laudakia tuberculata</i>	-	NA
Bronze Grass Skink	<i>Eutropis macularia</i>	-	NA
House lizard	<i>Hemidactylus frenatus</i>	-	LC
India bull frog	<i>Hoplobatrachus tigerinus</i>	-	DD
Cobra	<i>Naja naja</i>	-	LC
Rat snakes	<i>Ptyas mucosus</i>	-	NA

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

*Source:- Field Studies by SSWML Team

The birds in the area were studied by direct sighting, listening to the calls as well as by locating nest on the trees. The survey was conducted during dawn to midmorning, since most avian species are active during that time. All field observations were verified by using field guide "The Book of Indian Birds" by Dr. Salim Ali.

Status of Threatened Faunal Species

No rare, endangered, and threatened (RET) species of fauna was reported from the core zone as well as buffer zone of the study area.

3.21 GREENBELT MANAGEMENT

3.21.1 Purpose

Green belt is created for protecting sensitive areas and to maintain ecological balance, but they also act as an efficient biological filter or sinks for particulate and gaseous emissions, generated by vehicular movements and various industrial activities.

Green Belt Development provides an important tool to address the issue of mitigating the adverse effects of industrial and infrastructure projects. Green belt is recommended for containment and abatement of air pollution in urban-industrial environment. An optimally designed green belt is effective in reducing the impact of fugitive emission and pollutants accidentally or otherwise released at ground levels.

3.21.2 Design of Green Belt

The present plan comprises the details on field investigations, choice of plant species for greenbelt development as per CPCB guidelines, areas identified for development under greenbelt, feasibility in implementation, and development of landscape for identifying the feasibility of greenbelt development within proposed Bio-medical facility.

A detailed survey was conducted with respect to existing vegetation diversity and density etc in and around the study area for development of greenbelt and plantation. The greenbelt development plan has been formulated considering the parameters such as climate, soil types, topography etc.

3.21.2.1 Characteristic features of plants to be used for Absorption of pollutant gases.

- Plant species should be perennial and evergreen with thick canopy covers.
- The crown of tree (mass of foliage/leaves and branches growing outward from the trunk of the tree) should be either Oblong, Round or Spreading for effective absorption of pollutant gases.

3.21.2.2 Plantation technique

The plant species should be planted using pitting technique. The pit size should be 45cm X 45cm X 45cm for Shrubs and 70cm X 70cm X 70cm for trees. Soil used for filling the pit should be mixed with well decomposed Farmyard Manure (FYM) or Sewage sludge at the rate of 2.5 kg (on dry weight basis) and 4 kg (on dry weight basis) for shrubs and trees respectively. The filling of soil should be completed at least a week before actual plantation.

The pits measuring 70cm X 70cm X 70cm for trees are to be dug up at desired points in triangular pattern. For planting tall shrubs and dwarf trees 4.5m spacing between the plant rows is sufficient while medium and tall trees in middle and rear rows are to be planted 6-7 m and 7-9 m respectively depending upon the space available.

3.21.2.3 Three Tier System for Plantation

Close planting keeping dwarf trees with round canopy exposed to the source of emission followed by medium and tall trees with cylindrical canopy is ideal for the present situation.

Planting trees in staggering arrangements in multiple rows across the direction of the wind is recommended for better trapping and absorption of pollutants. The trees of the front row act as absorptive layers while the core area (rear rows) cleans the air. The width of the outer area of the plantation should be 3-4 times wider than the core area depending upon the availability of the space.

Though, the study area harbors good diversity; some species for green belt development are suggested, which are summarized as below:-

TABLE 3-28:- LIST OF PLANT SPECIES SUGGESTED FOR GREENBELT DEVELOPMENT

S. No	Botanical name	Local Name
1.	Dalbergia sissoo	Shisham
2.	Acacia catechu	Khair
3.	Azadirachta indica	Neem
4.	Mangifera indica	Mango
5.	Dendrocalamus strictus	Bamboo
6.	Ocimum sanctum	Tulsi
7.	Ficus religiosa	Peepal
8.	Syzygium cumini	Jamun
9.	Terminalia arjuna	Arjun
10.	Aloe vera	Aloe vera

3.22 MANAGEMENT & CONSERVATION MEASURES FOR BIODIVERSITY

It is an irrefutable scientific fact that there cannot be any developmental activity which is completely devoid of causing any environmental impact. Industrial sectors too are no exception to that. However, it is also a fact that environment is a dynamic entity and has a built-in during the Mining operations are likely to settle down in the core area premises.

The biodiversity is a resilient entity of the environment and can tolerate impacts and recuperate if their renewal mechanisms are unaffected over a long period of time. Therefore, focus should be laid on ensuring that the renewal dynamics of various floral and faunal taxa is not impeded by the mining activity.

Green belt will be developed according to CPCB guidelines. Plants of various species will be developed in the plant and peripheral areas. The Mine waste will be used for Plantation by planting local trees and bushes. Plantation shall be done in 1.0 ha. area, and 1200 trees shall be planted (1200 trees/hectare) along with grass. The improvement in the agricultural production will also increase the vegetal cover in the surrounding area. This coupled with Greenbelt development/ plantation is a favorable and eco-friendly measures to reduce the impact of the proposed mining activity on the biodiversity of the area.

Adequate measures will be adopted as a part of the Environmental Management Plan (EMP) to prevent entrainment of fugitive dust emissions. Thus, adverse impacts due to fugitive emissions are not expected to be significant.

This requires sensitization of stakeholders at various levels involved in the process of development to realize the importance of biodiversity and the role biodiversity in maintaining the ecological balance. Practically this can be achieved by:-

- ✓ Scaling up the Green Belt development in and around the site.
- ✓ Controlling the fugitive emissions and other airborne pollutants by appropriate technology at point source.
- ✓ Adherence to the strategies outlined in the EMP.
- ✓ Using paved roads for transportation to minimize fugitive emissions.
- ✓ Emission of particulate matter during operation phase will be controlled at source by using appropriate pollution control devices as per the CPCB guidelines.
- ✓ Maintain the preferred routes of animal's movement.
- ✓ Signboards in fluorescent ink should be placed along the major animal's route to make them readable in night-time.
- ✓ Built a clause in contract document for the contractor that would not permit the labours, workers, supervisors, contractors, and other employees to collect and utilize forest produce, including firewood. Frequent visits to the forest habitats for collection of resources might scare the wildlife and may also result in human - wildlife conflict.
- ✓ Creating a live hedge of sturdy woody shrubs along the periphery of treatment facility to restrict the wildlife to enter treatment facility. Closely packed *Azadirachta indica*, *Cassia fistula*, *Delonix regia*, *Opuntia*, *Ziziphus* can be used for the purpose.
- ✓ Educational and awareness drive in the labour camps to ensure traps are not laid by the labours for trapping small animals.
- ✓ Weed control method should be conformed to the ecological conservator officer to prevent any undesirable secondary impact.
- ✓ Removal or picking of any protected or unprotected plants shall not be permitted.
- ✓ The grass mix should consist of indigenous grasses adapted to the local environment conditions.

- ✓ In the event of animals presenting and posing a risk to human safety, a suitable animal handler must be requested to catch the animal in a friendly and responsible manner. This specifically refers to the snakes and scorpions.

3.23 CONCLUSION

- Before detailing the study area, a cursory understanding of the state scenario was prudent. The biodiversity of this region is largely related to the tropical moist sub-deciduous forests.
- The entire study area (Terrestrial and Aquatic) was covered in the best possible manner. To enlist the flora, fauna, and avifauna (terrestrial and aquatic), nocturnal and insect study was carried out as per objective of visit.
- The Vegetation in study area is sparsely located and moderately rich. The air borne emission will not affect forest growth due to enough distance and wind direction as per result of air pollutant dispersion modelling.
- Raising of plantation with suitable indigenous species will improve the environment.
- Design & Development of greenbelt needs to be done with spreading and round canopy, Fruit bearing, local and resilient plant species like Ficus spp., Gulmohar, Amaltas, Neem, Arjun, Mango, Jamun, Amla, Guava, Chiku and some fuel wood tree spp.
- For developing greenbelt in and around study area, care shall be taken to plant evergreen species like Azadirachta indica, Delonix regia, Cassia fistula, Terminalia arjuna, Mangifera indica, Tectona grandis, Dalbergia sissoo, Tamarindus indica, Achras sapota, Zizyphus spp. etc. Planting of such trees will support foliage and thus protection all around the year.
- Survival rate of the planted trees shall be closely monitored and the trees which could not survive shall be counted and replaced.
-

3.24 SOCIO-ECONOMIC REPORT

Introduction

Social Impact Assessment (SIA) is an essential prerequisite for initiating any developmental project, whether it involves new construction, expansion, or modernization. The assessment is made through a socio-economic survey and secondary data analysis. The outcome of the study relies on both quantitative and qualitative measures of impacts. The impacts are evaluated in terms of changes in community demographics, housing, employment, wage income, market effects, public services, retail business, quality of life and artistic qualities of the community.

Positioning proposed projects within their socio-economic context enables project proponents, local authorities, and community stakeholders to identify potential equity concerns, assess the adequacy of social infrastructure and services, and determine whether the intervention may produce adverse effects on collective social well-being. This structured approach ensures that development decisions are informed, equitable, and socially sustainable.

3.24.1 Historical Background

Una district, in southwestern Himachal Pradesh, was formed in 1972 after Kangra's reorganization. Once part of Jaswan State under Katoch rulers, it later came under Mughal, Sikh, and British control. The district is known for religious sites like Chintpurni Temple and Dera Baba Barbhag Singh, and has grown industrially due to its proximity to Punjab, with centers at Mehatpur, Gagret, Tahliwal, and Amb. Connectivity improved with the Nangal–Una railway line in 1991. Hindi, Punjabi, and Pahari are widely spoken, and the region experiences cool winters, hot summers, and a humid monsoon.

3.24.2 Administrative Sub-divisions

The Una district consists of five Sub-Divisions (Una, Amb, Haroli, Bangana & Gagret), five Tehsils (Una, Amb, Bangana, Haroli and Ghanari) and seven Sub-Tehsils (Bharwain, Ispur, Jol, Bihru Kalan, Dulehar, Gagret at Kaloh, Mehatpur Basdehra).

3.24.3 General information about the project site

The proposed project involves Riverbed mining for the extraction of sand, stone, and bajri from Swan River, undertaken by Sh. Raghav Thakur, proprietor of M/s Aadhya Stone Crusher. The mining area covers 2.0569 hectares, identified under Khasra Nos. 2873, 2880/1, 2880/1/1, 2882. Within 500 meters, it forms a cluster with two existing mining having lease area respectively 3.5511 hectares and 2.0901 hectare, bringing the total cluster area to 7.6981 hectares. The site is located in Mauza/Mohal Ramnagar, Tehsil Ghanari, District Una, Una, Himachal Pradesh.

3.24.4 Study Area

The study area consists of the core area and the buffer zone. The core area is where the project is located, and a buffer area encircling the project site with a radius of 10 kilometres from the periphery. The project site is situated in Tehsil Ghanari (earlier name-Amb tehsil), District Una, Himachal Pradesh. Within a 10 km radius of the site, in addition to villages belonging to Ghanari Tehsil, several villages from Bangana and Gagret Tehsils also fall in proximity. Furthermore, seven number of villages from Garhshankar Tehsil, District Hoshiarpur, Punjab are located nearby. The Longitude and Latitude of the site are given below:-

Sr. No.	Latitude	Longitude
1	31° 40' 10.57" N	76° 4' 50.77" E
2	31° 39' 56.98" N	76° 5' 4.61"E

As a language Hindi is used by the majority of locals followed by Pahari and Punjabi.

3.25 OBJECTIVES OF THE SOCIO-ECONOMIC (SE) STUDY

- ✓ To study the existing baseline of socio-economic profile of communities in and around the project area.
- ✓ Assess existing infrastructure and public services including education, healthcare, transport, and livelihood resources.
- ✓ Evaluate potential positive and negative socio-economic impacts of the proposed mining activity on local communities.
- ✓ Recommend mitigation measures and community development initiatives to promote sustainable growth and reduce adverse effects.

3.26 METHODOLOGY

Preliminary desktop study was done for the investigation area covering all villages falling within the distance of 10 km from the project site.

The socio-economic profile was studied through both the primary surveys and secondary data collection. Collection and evaluation of baseline data for various socio-economic parameters in and around the proposed site has been done. A questionnaire was used to undertake the primary survey fulfilling the objectives of the study. The data collected during the above survey was analyzed to evaluate the prevailing socio-economic profile of the area. Accordingly, both qualitative and quantitative data were analyzed from both primary and secondary sources. Primary Census Abstract (PCA) 2011 is the main source of secondary data.

For the socio-economic study, a settlement map prepared on a toposheet has been used to delineate the study area. A 10 km radius from the project site has been considered for the assessment and divided into three zones:-the immediate impact area (0–3 km), the intermediate impact area (3–7 km), and the extended impact zone (7–10 km). The primary survey focuses on the 0–3 km impact area. 10% of the total villages falling into the study.

area, are included in the primary survey. In cases where the number of villages in the 0–3 km zone is insufficient or not representative of the overall study area, villages from the 3–7 km intermediate impact area may also be included in the survey.

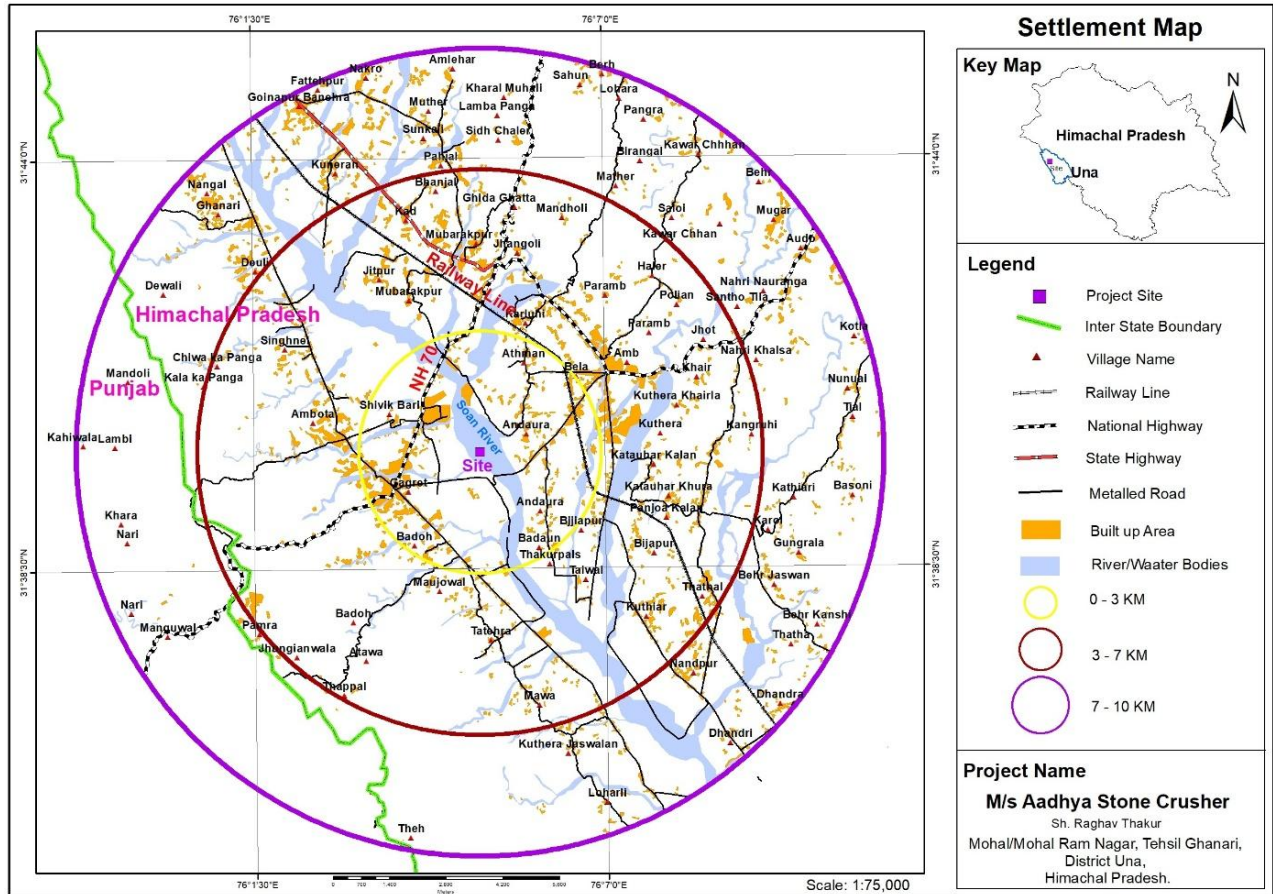


FIGURE 3-20: SHOWING LOCATION OF VILLAGES' WITHIN 10 KM RADIUS OF BOUNDARY

3.27 BASELINE DATA

A total number of 56 Villages were found in a radius of 10 km from the project site as per the toposheet. Additionally, seven villages from Garhshankar Tehsil, District Hoshiarpur, Punjab are located in close proximity to the site. The project site lies within a 10 km periphery of the interstate boundary between the two states. Himachal Pradesh serves as the main state where the project is situated. A comprehensive primary survey of the designated impact area has been carried out.

3.27.1 Primary survey

A comprehensive primary survey of the designated impact area has been carried out. A location map of the impact area, highlighting the villages selected for the primary survey, is shown below:-

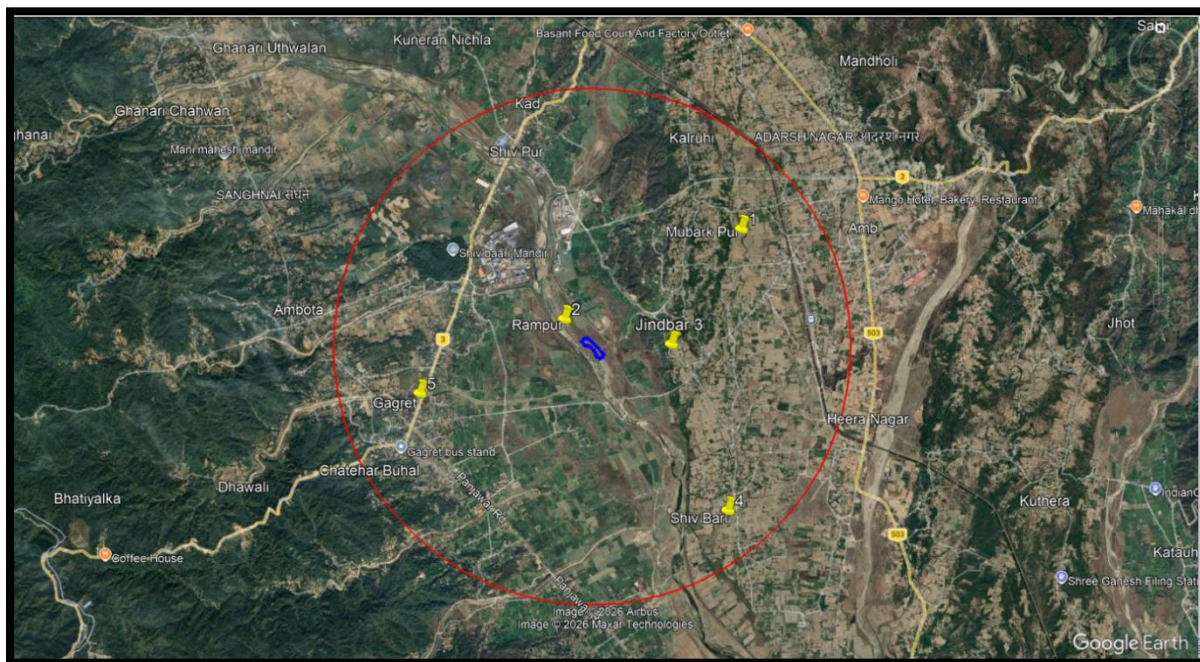


FIGURE 3-21: MAP SHOWING THE LOCATION OF SIX VILLAGES WITHIN THE IMPACT AREA

According to the toposheet analysis, a total of 56 villages lie within a 10 km radius of the project site in Himachal Pradesh. Five villages from Himachal Pradesh, located within the impact area (0–3 km), were selected for the primary survey. These include Mubarakpur, Rampur, Jindwar, Shivbari, and Gagret, all of these villages are situated within Tehsil Ghanari (Former name-Amb Tehsil), forming part of the designated primary study area.

3.27.2 SECONDARY DATA

Secondary data within a 10 km buffer of the project site, based on the 2011 Census, is presented below along with its interpretation.

3.27.2.1 Demographic details of the Study area within 10 Km periphery

TABLE 3-29: DEMOGRAPHIC DETAIL OF THE STUDY AREA (10 KM RADIOUS), BASED ON CENSUS 2011

Sr. No.	Teh sils	Name of the Villages	No_H H	TOT _P	TOT_ M	TOT _F	P_0 6	P_S C	P_S T	P_LI T
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1		Chalaul Behr (24/3)	30	117	57	60	6	0	0	93
2		Thaneek Pura (31/9)	117	535	266	269	57	40	0	454
3		Mawan (31/13)	63	265	130	135	29	12	0	213
4		Lamba Panga (31/4)	0	0	0	0	0	0	0	0
5		Talwal (150)	61	330	182	148	41	0	0	259
6		Amb (143)	363	1759	919	840	180	244	0	1428
7		Athwan (142)	166	813	411	402	89	150	18	646
8	Am b	Mandho li (77)	43	179	91	88	18	42	0	142
9		Saloi (81)	112	521	260	261	60	261	37	400
10		Muthehar (72)	61	289	146	143	36	254	0	208
11		Bringal (71)	34	159	79	80	20	5	0	122
12		Lahar (38)	63	259	131	128	31	54	7	202
13		Santu Tilla (66)	56	264	135	129	31	19	0	207
14		Jhot (86)	16	76	37	39	8	31	29	55
15		Nahari Nauranga (90)	85	430	207	223	45	49	0	353
16		Kotla (91)	36	138	78	60	20	36	49	95

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17		Bharwan Urf Kangruhi (106)	129	575	295	280	76	329	0	437
18		Kuthera (85)	609	2923	1534	1389	398	497	43	1965
19		Kharijala (114)	59	269	139	130	34	42	35	230
20		Katauhar Kalan (151)	290	1256	647	609	178	245	0	860
21		Kathauhar Khurd (152)	245	1036	530	506	120	211	0	830
22		Bijapur (159)	120	517	250	267	65	0	0	397
23		Kathiari (158)	378	1679	816	863	187	289	0	1302
24		Nandpur (163)	372	1714	859	855	232	112	0	1252
25		Thathal (157)	286	1351	686	665	160	132	0	1067
26		Panjoa Khurd (154)	72	336	178	158	29	150	0	275
27		Dhandari (165)	276	1390	708	682	153	84	19	1025
28	Gagret	Ghanari Dathwalan (130)	38	190	93	97	22	0	0	153
29		Deoli Jaswalan (136)	259	1127	538	589	118	78	0	912
30		Kuneran Upperla (131)	120	533	272	261	72	23	0	355

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31	Gondpur Banehra Nichla (127)	339	1482	708	774	165	334	0	1187
32	Fatehpur (20)	110	561	286	275	67	243	0	430
33	Amlehar (133)	213	839	408	431	101	151	0	636
34	Bhanjal (134)	324	1486	732	754	165	68	74	1181
35	Kad (135)	143	635	340	295	48	98	0	547
36	Jitpur Baheri (137)	137	652	333	319	68	75	0	526
37	Kala Panga (137)	18	81	36	45	2	0	0	72
38	Ambota (139)	380	1801	893	908	202	308	0	1518
39	Gagret (140)	280	1245	640	605	118	718	1	1059
40	Baroh (147)	406	1763	867	896	224	450	0	1405
41	Pambra (146)	64	286	158	128	36	150	0	214
42	Thaplan (148)	65	335	172	163	53	214	27	246
43	Tatera (160)	523	2426	1303	1123	298	550	381	1740
44	Kuthera Jaswala Upperla (164)	108	525	268	257	54	59	98	408
45	Kuthera Jaswala	342	1598	818	780	175	375	0	1259

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		Nichla (164)								
46		Loharli Upperli (167)	164	776	377	399	68	141	6	656
47		Loharli Nichli (167)	279	1281	634	647	168	96	8	956
48		Pallian (1/3)	122	585	290	295	59	197	1	430
49		Behrar (16/2)	35	162	75	87	11	0	0	130
50		Kud (5/15)	43	182	88	94	24	37	0	132
51	Ban gan a	Kiarian (5/12)	4	16	10	6	0	0	0	11
52		Khairian (4/12)	46	232	120	112	28	28	0	166
53		Kawari (6/16)	30	152	70	82	26	29	0	116
54		Ambe Da Behra (6/2)	41	178	86	92	20	111	0	134
55		Haleran	162	732	356	376	76	41	0	492
56		Theh	134	705	345	360	77	0	0	546
Total Villages = 56			9071	41746	21087	20299	4862	783	833	32134

*Source:- 2011 census

3.28 Demographic Profile of the study area within 10 Km

The demographic profile of the study area includes 56 villages situated within a 10 km radius of the location where the Himachal region weather project is located, comprising 9071 households and a total population of 41746 in which Males constitute 50.51% (21087) and females 48.62% (20299). The sex ratio in the study area is 962, which is slightly lower than the overall state figure of 972. Children under 6 years total 4848 which is about 11.61%. The literacy rate is 76.97%, which is quite good, but still a little lower than the state average of 82.80%. Scheduled Castes

form 18.83% of the population (7862 individuals), while minimal number of Scheduled Tribe population is present that is 1.99%. Detailed village-wise data is provided below."

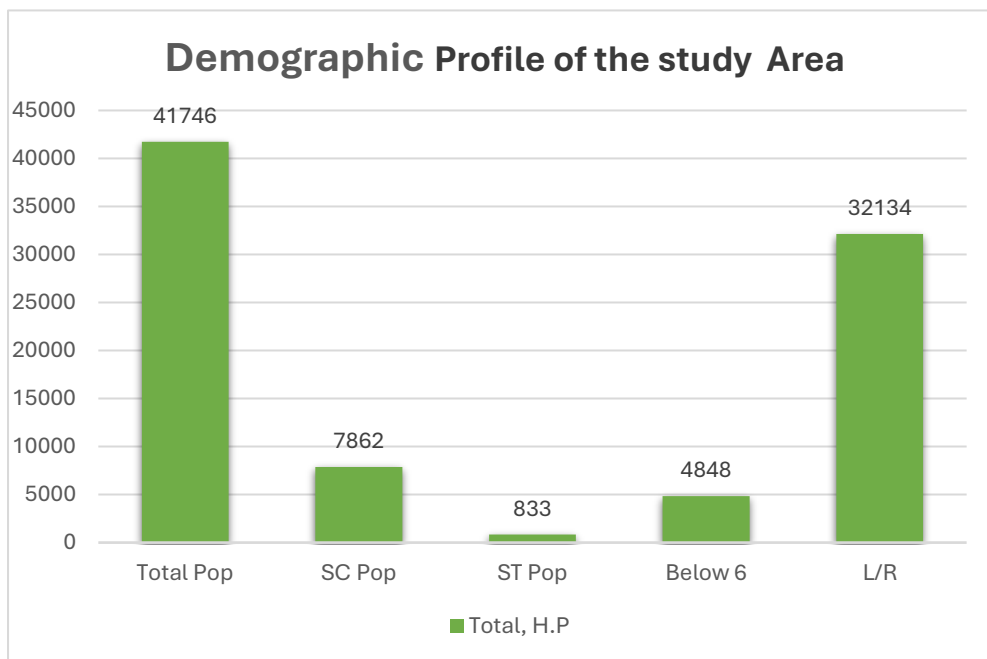


FIGURE 3-22: DEMOGRAPHIC STATISTICS OF THE STUDY AREA

TABLE 3-30: OCCUPATIONAL PATTERN OF THE STUDY AREA (10 KM RADIOUS), BASED ON CENSUS 2011

Total No. of villages	Total Working Population		Main Working Population		Marginal Working Population		Non -Working Population	
	M	F	M	F	M	F	M	F
56	18227		11463		6203		23519	
	M	F	M	F	M	F	M	F
	11515	6712	9122	2902	2393	3810	9572	13947

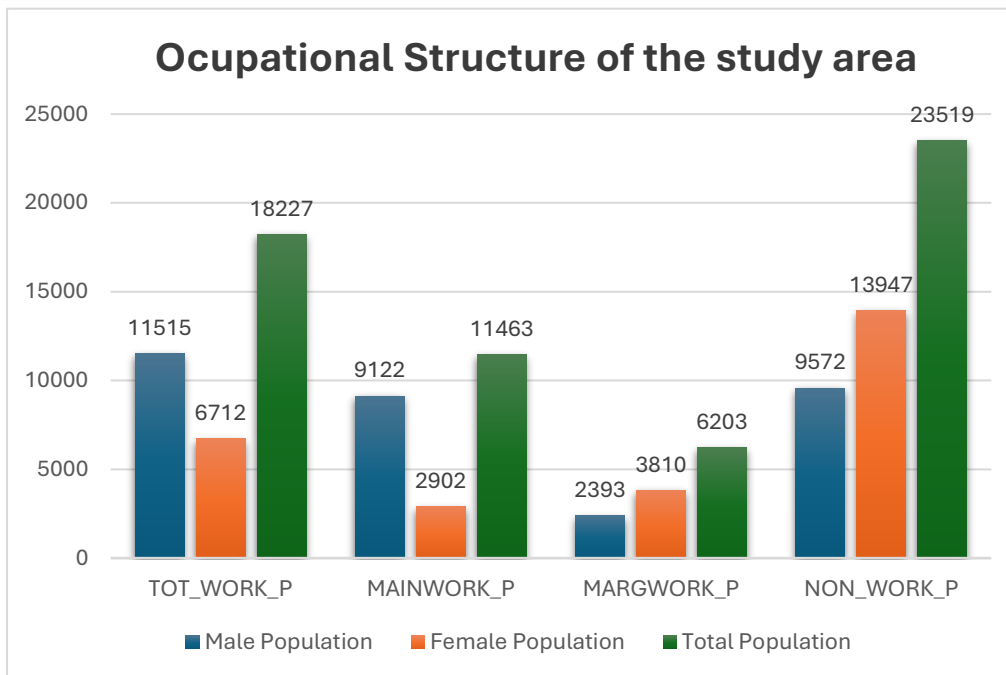


FIGURE 3-23: OCCUPATIONAL STRUCTURE OF THE STUDY AREA

3.29 Occupational structure of study area

The economic development of the region is heavily shaped by factors such as its geographical location, natural resource availability, business activity, employment prospects, industrial presence, and workforce capacity.

Across 56 villages, the total working population stands about 43.66% of the total. of this, 27.46% are identified as main workers while 14.86% are marginal workers. The remaining 56.34% of the population are classified under non-workers, which is larger. A gender breakdown shows that men dominate the workforce: 9,122 are main workers and 2,393 are marginal workers, while women form 2,902 main workers and 3,810 marginal workers. Women form the majority of the non-working population while men consist of 9,572.

This distribution indicates that while overall workforce participation is significant, men are more likely to be engaged in stable, main work, whereas women contribute more prominently to marginal work. The higher proportion of non-working women highlights a gendered employment gap, contrasting with regions like Himachal Pradesh, where workforce participation is driven by marginal workers.

Agriculture remains the primary occupation for the majority of the population. However, with the proposed project, the area’s workforce is expected to shift toward industrial and business activities, leading to greater diversification of employment opportunities.

3.30 SOCIAL COMPOSITION

From the baseline data it is found that the population of Una district is predominantly Hindus and next come Sikhs and third being the Mohammedans. The majority of the population in these villages follows the Hindu religion with a sizable portion of Sikh. There is a sprinkling of Jains and Christians in the district. Hindi is the most widely spoken language with Pahari and Punjabi.

A) Culture

The culture of Una we will find a mix of people, both from their roots in Punjab and Himachal Pradesh along with settlers from the nearby states. The Himachal's Hindu people worship Hindu deities (devtas), Sikh Worship Gurus and various customs and rituals are observed by the people. Hindi remains the most commonly spoken language in this region.

Pahari and Punjabi also have definite prominence. The Navaratra fairs, especially Shravani Navartras, are very popular among the devotees of goddess. Devotees from all walks of life have been visiting to this place for centuries to seek blessings from the goddess Chhinnmastika. A number of fairs and festivals are celebrated in Una i.e., Hola Mohalla fair, Chintpurni fair, Sawan Ashtami Fair, Paanch Bhisham fair, Piplu fair, Baisakhi festival, Prakash Utsav.

B) Employment

The project will generate employment and ancillary business opportunities and improving the standard of living of locals. A total of 15 people will gain direct employment through the project. Most of the villagers in this region are engaged in agricultural activities as well as industrial activities. The mining operations will provide employment in the form of Skilled, Semiskilled, and Unskilled workers. People are engaged in extraction of Sand, Stone & Bajri, loading of material into tractors trolleys/tipper trucks. Stone will be transported to the stone crusher and after that it will be transported to market for sale along with Sand and Bajri.

C) Economy

The local economy is mainly based on Agriculture. In recent years there has been growth in various light industries including pharmaceuticals and textile manufacturing in Una. This has been mainly because of the town's location and proximity to other state borders. The state government has also provided subsidies on taxes to entrepreneurs and an industrialist to set up their operations in the town. The district has mineral resources such as sand, stone and bajri are available in plenty in various river/stream beds. Una district is well developed in the industrial sector due to close proximity to Punjab. Mehatpur, Gagret, Tahliwal, and Amb serve as the principal industrial hubs of Una.

D) Crops

major crops are Maize, wheat, and Paddy. In vegetables tomatoes, Cabbage, Cauliflower, Peas, Cucurbits and Potatoes etc. are the main cash crops grown in many parts of the district.

E) Road, Rail and Air Connectivity

Gagret area is about 2.40 Km in West direction away from the mine site which is well connected with road and railway. The Nearest Railway Station:- Amb Andaura Railway Station is about 2.45 km in the East direction (Aerial Distance). The Nearest Airport:- Jalandhar Airport is about 40.85 km in SW direction (Aerial Distance). The Nearest Highway:- National Highway-NH-70 (Jalandhar-Hoshiarpur-Mandi Rd) is about 1.90 km in West direction.

F) Place of Historical or Archaeological Interest

There is no place of Historical or Archaeological importance near the proposed project area. But Una is about 28.05 km (arial distance) away from the project site which contains Historical or Archaeological importance. On the border with Punjab, Una is known as the gateway to Himachal Pradesh. Una city is set on the banks of the gurgling Swan River. Within the state it has borders with Kangra, Hamirpur and Bilaspur Chintpurni Mata mandir is a famous religious place in Una, Himachal Pradesh. Sunday is a special day for visiting here. People Comes to this place from Neighboring states like Haryana and Punjab.

3.31 BASIC AMENITIES

i) Educational

The Una has educational facilities at all levels, including schools, colleges, and institutes, located approximately 28.05 km (aerial distance) in SE direction. The nearest School is The Govt. Primary School at Mubarikpur village situated about 1.44 km to the NE direction. Dr. B.R Ambedkar Government Polytechnic College Ambota, Una, lies 2.08 km to the WNW direction, while ICFAI University, Una, is around 29.34 km to the SE direction from the project site.

ii) Medical

The Una has facilities of Nursing Homes, Charitable Hospitals, Health Centers, and Civil Hospitals besides many private clinics which is about 28.05 km from the project site, Additionally, a Health Centre lies in West direction at Gagret while the Civil Hospital Gagret Una is situated approximately 2.44 Km (Aerial distance) in West direction from the project site.

iii) Electricity

Electricity for all purposes is available in all villages of the study area.

iv) Housing and Drinking water

A major part of the houses in the study area is Pucca Houses. All villages in the study area have water supply for domestic purposes. The sources of water supply in most of the villages are through pipelines; however, people have preference for ground water. The water source in these

areas is through the Himachal Pradesh Jal Shakti Vibhag Scheme connection and private bore wells.

v) Transport

The main mode of transportation is by road. A network of both paved (Pucca) and unpaved (Kucha) roads exist in the study area; both are suitably interconnected. Private vehicles like rented Cars, Taxis and services share the major responsibility of the transport in the study area. A number of buses, private and State Government are operating public transport like Himachal Road Transport Corporation (HRTC) on state highways. The existing local transport facility appears to be sufficient.

vi) Post and Telegraph

The study area is also well connected through mobile networks, ensuring reliable communication. The Post and telecommunication facilities such as post office, telegraph office, telephone services, FAX, STD, and ISD are available in the nearby villages. For advanced and modern facilities, Una town is located approximately 28.05 km (Aerial distance) in SE direction from the project site.

3.32 BASIC INFRASTRUCTURES AVAILABLE IN FIVE SURROUNDING VILLAGES SELECTED FOR PRIMARY SURVEY

The following details have been identified through both primary and secondary surveys.

TABLE 3-31 INFRASTRUCTURES DETAIL IN FIVE SURROUNDING VILLAGES

Sr. No.	Name of Infrastructure	Name of the Villages									
		Mubarak pur		Rampur		Jindwar		Shivbari		Gagret	
		2011	2026	2011	2026	2011	2026	2011	2026	2011	2026
1.	Medical Facilities										
	Dispensary	√	x	x	x	x	x	x	x	√	x
	PHC	x	x	x	x	x	x	x	x	x	x
	Hospital	x	x	x	x	x	x	x	x	x	x
	Veterinary Hospital	√	x	x	x	x	x	x	x	√	√
2.	Educational Facilities										
	Primary School	x	√	√	x	x	x	x	x	√	√
	Secondary School	x	x	x	x	x	x	x	√	√	√
	Sr. Sec. School	x	x	x	x	x	x	x	x	x	√

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	College	x	x	x	x	x	x	x	x	x	x
	ITI	x	x	x	x	x	x	x	x	x	x
3.	Transport										
	Kuccha Road (Gravel)	√	√	√	√	x	√	x	√	√	√
	Puccha Road (Black Topped)	√	√	√	√	x	√	√	√	√	√
	Bus Services (within 5 km)	√	√	√	√	√	√	√	√	√	√
4.	Communication										
	Post Office	√	x	x	x	√	x	x	x	√	√
	Telephone	√	√	x	√	√	√	√	√	√	√
5.	Civic Amenities										
	Water	√	√	√	√	√	√	√	√	√	√
	Electricity (Power Supply)	√	√	√	√	√	√	√	√	√	√
6.	Social/ Cultural Facilities										
	Community Center	x	x	x	x	x	x	x	x	x	√
	Banks	√	x	√	x	√	x	x	x	√	√
	Sports Field (Playground within 5 Km)	x	x	√	√	√	√	x	x	x	√

3.33 DATA INTERPRETATION

The comparative data from 2011 to 2026 across five villages in Himachal Pradesh shows progress in water, electricity, and road connectivity, which are now widely available across villages. Healthcare remains inadequate, with only a few dispensaries and veterinary hospitals, while PHCs and general hospitals are missing. Primary education has expanded, but higher education facilities are limited, with just one senior secondary school and no colleges or ITIs. Transport has improved, with both kuccha and pucca roads and universal bus services. Communication infrastructure is better, with widespread telephone access, though post offices are limited. Social amenities like banks exist in some villages, but community Centers and sports fields are inconsistent. Overall, while basic infrastructure has strengthened, healthcare, higher education, and social facilities still need focused development.

3.30 NEED IDENTIFICATION

The villages demonstrate a significant need for strengthened healthcare infrastructure, including the establishment and upgrading of dispensaries, Primary Health Centers (PHCs), and hospitals to meet rising medical requirements. Expanding higher education institutions and vocational training centers is essential to close learning gaps and create future opportunities. Improvements in sanitation, clean water, and transport facilities will further enhance living standards. Social awareness initiatives focusing on health, education, and gender equality can encourage inclusive

participation within communities. Economic empowerment through skill development and job creation remains vital for sustainable livelihoods. Collectively, these measures will foster balanced, sustainable, and inclusive rural development.

3.31 RECOMMENDATION

In the socio-economic context of an EIA, Riverbed mining projects should generate employment, revenue, and local enterprise growth while ensuring inclusivity and sustainability. Key recommendations include:-

- Provide skill training for youth, women, and marginalized groups.
- Support ancillary businesses such as dhabas, shops, and transport.
- Prioritize local workforce participation.
- Strengthen healthcare outreach and vocational initiatives.
- Integrate sustainable mining practices for long-term community and environmental benefits.

3.32 CONCLUSION

The proposed Riverbed mining project will contribute to regional socio-economic growth by diversifying income sources, generating state revenue, creating jobs, and supporting local enterprises. By reducing dependence on agriculture and stimulating ancillary businesses, it fosters income stability and enables communities to invest in education, healthcare, and better living standards, ensuring balanced and sustainable development. The proposed project is expected to bring socio-economic benefits through job diversification, income stability, improved infrastructure and healthcare, environmental safeguards, and empowerment of women and youth.

3.33 REHABILITATION & RESETTLEMENT (R&R) ACTION PLAN

The project will not result in any displacement of people; therefore, no Rehabilitation and Resettlement (R&R) Action Plan is required. Additionally, there is no land acquisition involved.

4 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

Identification of all potential environmental impacts due to project is an essential step of Environmental Impact Assessment. In the case of mining projects, impacts on biodiversity, air pollution, water pollution, waste management and social issues are significant. Both direct and indirect environmental impacts will be created on various environmental attributes due to proposed mining activity in the surrounding environment, during the operational phase. The occurrence of stone, boulder, bajri & sand (minor mineral) deposits, being site specific, their exploitation often does not allow for any choice except adoption of eco-friendly operation. Positive impacts on the socio-economic environment are expected due to the creation of employment opportunities. Mining activities are normally carried out over a long period which also encourages development in the area such as roads, schools, hospitals etc. Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause-and-effect relationships between sources of pollution and different components of the environment. In cases where it is not possible to identify and validate a model for a situation, predictions have been arrived at based on logical reasoning/consultation/extrapolation.

4.2 GENERAL IMPACTS

The environmental baseline scenario is detailed in Chapter-3 and proposed Mining Project for Extraction of Sand, Stone & bajri located at Khasra No. 2873, 2880/1, 2881/1 and 2882 falling in Mauza Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh as described in Chapter 2, it is attempted to assess the likely impact and its extent on various environmental parameters in this Chapter. The parameters, which are relevant within the context, are as detailed below.

- Land use/ Landcover (LU/LC)
- Air Environment (AP)
- Ambient Air Quality (AQ)
- Noise levels and vibration (NV)
- Water resources
 - Ground Water (GW)
 - Surface Water (SW)

- Soil (S)
- Ecology & Biodiversity (EB)
- Socio Economic (SE)
- Solid and Hazardous Waste Management (SHW)
- Hydrogeology (HG)
- Geology (GEO)
- Occupational health, community health and safety (OH/CH &S/ RH)

4.3 IMPACT ASSESSMENT METHODOLOGY

To carry out the impact assessment during mining operation the methodology adopted for impact assessment in operation phase activity adverse or positive impact is identified and divided into the following sections here under:-

- ❖ Identification of project activities & aspect
- ❖ Impact Prediction, evaluation due to these activities and its mitigation measures
- ❖ Impact analysis i.e., consequence/Score analysis

4.4 IDENTIFICATION OF IMPACT

Applicable components of the environment on which the environmental aspects can cause an impact were identified. Environmental impacts have been identified based on an assessment of environmental aspects associated with the proposed project of riverbed mining. The symbol '–' indicates an adverse impact, '+' indicates a beneficial impact and '+/–' indicates both positive and negative and 'N' indicates not applicable Impacts.

TABLE 4-1: IMPACT IDENTIFICATION

Sr. No.	ASPECT /PROJECT ACTIVITIES	POTENTIAL IMPACT AREAS									Remarks
		Land-use/ land-cover	Air Quality (AQ)	Noise and	Surface Water (SW)	Ground Water (GW)	Soil(S)	Ecology & Biodiversity	Socio-Economic (SE)	OH/CHS	
		L U	A P	N V	S W	G W	S	EB	SE	RH	
1	Operational Phase										

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4.1	Deterioration of Air, Water, and Soil, Noise quality, due to mining operation	N	-	-	-	-	N	-	+	-	<p>AQ/NV:-Air pollution due to dust emission & increase in Noise by transportation.</p> <p>WP: Wastewater, if generated during mining activities, has the potential to cause water pollution.</p> <p>RH:-Accident during loading & unloading of material and due to transportation. OH/OH&S: risk of injury to worker during loading and unloading of material</p> <p>SE:- Employment generation for local people.</p> <p>EB: Impact on ecology and biodiversity of surrounding area due to mining activity.</p>
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4.2	Mining operations may lead to contamination of surface water through the ingress of soil and sediments.	N	N	N	N	-	N	N	N	-	GW:- Groundwater contamination may occur if wastewater is generated.
4.3	Intersect ground water level due to mining activity Mining activity	N	N	N	N	-	N	N	N	N	GW: Ground water may Intersect ground water level if restrictions in evacuation is not followed (up to 1 meter) mining will be carried out.
4.4	Contamination in air quality,	N	-	N	N	N	N	N	N	N	AQ: Fugitive dust emission due transportation of material.

4.5 IMPCAT PREDICTION/EVALUATION AND ITS MITIGATION MEASURES:-

For prediction of environmental impacts arising from activities associated with Riverbed mining operations, several scientific techniques and methodologies are employed. Mathematical models and analytical tools are used to quantitatively describe the cause-and-effect relationships between sources of disturbance (such as excavation and slope modification) and different components of the hill ecosystem. In situations where validated models are not available for the specific terrain, predictions are derived through logical reasoning, expert consultation, extrapolation of similar case studies, or overlay methods using slope stability and erosion mapping. For each environmental component, the methods adopted to arrive at the likely impacts are clearly described.

Evaluation in this context refers to the assessment and prediction of impacts expressed in numerical or qualitative terms. Assessment is the process of identifying and interpreting the environmental consequences of significant mining actions, while prediction involves mapping the potential outcomes of slope disturbances. Significant actions include direct adverse changes such as soil erosion, slope instability, loss of vegetation cover, and alteration of hydrological regimes, which in turn affect the health of flora, fauna, human settlements, socio-economic conditions, landforms, and the quality of the surrounding bio-physical environment. In most cases, predictions indicate whether there will be degradation, stabilization, or improvement of environmental quality.

An impact indicator is a parameter that provides a measure of the significance and magnitude of slope-related impacts. In India, indicators are available in the form of soil erosion indices, slope stability ratings, biological water quality criteria, and national ambient standards for noise and air. Predictions for biological components are often uncertain, as the response of hill ecosystems to stress (such as vegetation removal or altered drainage) cannot be determined in absolute terms. The impacts of the proposed riverbed mining project have been considered based on site-specific data and information provided by the project proponents. Primary impacts are directly attributed to mining activities, such as slope cutting, dust emissions, and water runoff. Secondary impacts are indirectly induced, including changes in land use, altered socio-economic patterns, and associated infrastructure development.

During the operation phase, each mining activity excavation, transportation, waste dumping, and slope reshaping has been analyzed to assess its impact on environmental parameters. Following preliminary studies, environmental indices likely to be affected (air quality, noise levels, water resources, soil stability, and socio-economic conditions) have been identified. Impact activities are assessed using both subjective and objective criteria. The types of potential impacts for the various components of the hill environment air, noise, water, land, slope stability, and socio-economic factors are summarized and shown in above **Table No. -4.1**.

4.6 ASPECT, QUANTIFICATION OF IMPACT AND PROPOSED MITIGATION MEASURES

Mitigation measures required are formulated for implementation for all high risk and moderate risk activities. A programme to implement all mitigation measures is then prepared and presented as an Environmental Management Program.

For various activities at different stages of mining operation impacts identified are listed in following section along with the mitigation measures proposed for these activities.

4.7 LAND ENVIRONMENT

The lease area is situated in the in the Swan River form of Riverbed a Major Tributary of Satluj River. The highest point of the mining lease area is 461 meters above MSL and lowest point in 460 meters above MSL. This is an open cast mining. The Mining lease area is private land and in the form of a Riverbed. The proposed mining lease area is situated near the Ramnagar village and lies between embankments of Swan River. The general flow low of the Swan River in this section is from North to South. Riverbed of stream is occupied with recent deposits comprising predominantly of boulders, sand and river-borne bajri. The proposed activity is to take place on the riverbed and hence there will be no change in land use.

4.7.1 Anticipated Impacts

- Undercutting and collapse of riverbanks.
- Riverbank cutting and erosion.
- Upstream erosion as a result of an increase in channel slope and changes in flow velocity.

- Downstream changes in patterns of deposition.
- Changes in channel bed and habitat type.

4.7.2 Mitigation measures

- Mineral will be mined out leaving sufficient no mining zone of 1/10th of the total width of the river from both sides of the bank for bank stability and also leaving a safety zone from the stream.
- Grasses and bushes which have fibrous roots at the first instance are proposed to be grown along the banks which enhances the binding properties of the soil. Hence protecting the banks.
- In this activity, the work is proposed to be done manually which will avoid adverse effects associated with heavy machinery and their functioning.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Restoration of the bank will be ensured at the end of mine closure every year.

4.8 WATER ENVIRONMENT

4.8.1 Anticipated Impacts

- River recharges groundwater but excessive/illegal mining will reduce the thickness of the natural sediments layers that act as filters materials, weakening the recharge process.
- Mining activity may intersect groundwater level.
- Wastewater generated from the mining activity will cause water pollution.
- Domestic wastewater generated from temporary toilets may cause contamination in water.

4.8.2 Mitigation measures

Restriction in excavation depth will be made compulsory to avoid reduction in the thickness of the natural filter materials. Which is 1meter as per state mining policy.

- Mining in the area will be done well above the water table as well as riverbed water level; therefore, much impact on water regime is not anticipated.
- No wastewater will be generated from the mining activity of stone, boulder, bajri & sand(minor minerals) as the project only involves their extraction from riverbed.
- The domestic wastewater generated from temporary toilets used by the work force will be treated in septic tank followed by soak pit.

The deposit will be worked from the top surface up to a maximum depth of 2m below ground level or above the ground water table whichever comes first. Hence mining will not affect the ground water regime as well. Further mining will be completely stopped during the monsoon seasons to allow the excavated area to regain its natural profile.

4.9 AIR ENVIRONMENT

A number of sources from the proposed project which can cause potential impacts on Air environment during operation phase are discussed below.

4.9.1 Operational Phase

The mine activity has only fugitive emission due to mine operation and loading /transportation activities.

4.9.2 Anticipated Impacts

Emission of fugitive dust is envisaged due to:-

- i. Mining Activities include excavation and lifting of minerals. The dust generated is likely to be insignificant as compared to mining processes involving such as drilling, mechanized loading etc. because the whole process will be done manually.
- ii. Minerals will be transported by trucks through the road. Fugitive dust emission is expected from the haul road due to the transportation of trucks.

4.9.3 Air Quality Modeling

Air modeling is a way to mathematically simulate atmospheric conditions and behavior; it is usually performed using computer programs. Air models can calculate pollutant concentrations in the air or the amount of pollution deposition estimates on the ground from the air by using various inputs such as meteorological parameters viz. temperature, wind speed and direction, mixing depths, inversion level, etc. and source emissions. Air models can predict pollutant concentrations at almost any location and provide an efficient way to examine air quality over large areas.

Further air models can predict the impacts of new sources before they are built and also allow an examination of the effects of different types of pollution controls before any actual changes are made to the sources of pollution. In addition, air modeling is sometimes used to locate air quality monitors in areas where high pollutant concentrations are most likely to occur.

Considerable sources of impact on air environment will be fugitive emission and transportation emission from lease. To identify the incremental load on ambient air quality, it is necessary to assess the impact of existing ambient air quality with respect to the proposed fugitive and transportation emission. In order to predict the impact of air pollutants on ambient air quality, the incremental Ground Level Concentration (GLC) has been computed using Industrial Source Complex – Short Term (ISCST – 3) model, which is a steady-state Gaussian plume model.

About AERMOD CLOUD™

AERMOD CLOUD™ is an Integrated Graphical User Interface of AERMOD, ISCST3, AERMAP and AERMET. The application incorporates popular U.S. EPA air dispersion models AERMOD and ISCST3 into one integrated graphical interface. AERMOD and ISCST3 models are used extensively for Environmental Impact Assessment (EIA) studies to assess air pollution concentration. ISCST3 (Industrial Source Complex Short Term) is a Gaussian plume model and is widely used to assess

pollution concentration and/or deposition flux on receptors from a wide variety of sources. AERMOD is the next generation air dispersion model which incorporates planetary boundary layer concepts.

The ISCST3 (Industrial Source Complex - Short Term version 3) dispersion model is a steady-state Gaussian plume model which can be used to assess pollutant concentrations and/or deposition fluxes from a wide variety of sources associated with an industrial source complex. The ISCST3 dispersion model from the U. S. Environmental Protection Agency, was designed to support the EPA's regulatory modeling options, as specified in the Guidelines on Air Quality Models (Revised). Some of the ISCST3 modeling capabilities are:-

- ISCST3 model may be used to model primary pollutants and continuous releases of toxic and hazardous waste pollutants.
- ISCST3 model can handle multiple sources, including point, volume, area, and open pit source types. Line sources may also be modelled as a string of volume sources or as elongated area sources.
- Source emission rates can be treated as constant or may be varied by month, season, hour-of-day, or other optional periods of variation. These variable emission rate factors may be specified for a single source or for a group of sources.
- The model can account for the effects of aerodynamic downwash due to nearby buildings on point source emissions.
- The model contains algorithms for modelling the effects of settling and removal (through dry deposition) of large particulates and for modelling the effects of precipitation scavenging for gases or particulates.
- Receptor locations can be specified as gridded and/or discrete receptors in a Cartesian or polar coordinate system.
- ISCST3 incorporates the COMPLEX1 screening model dispersion algorithms for receptors in complex terrain.
- ISCST3 model uses real-time meteorological data to account for the atmospheric conditions that affect the distribution of air pollution impacts on the modelling area.
- Results can be output for concentration, total deposition flux, dry deposition flux, and/or wet deposition flux.

Key features

- Integrated GUI of AERMOD (v18081), AERMET (v18081), AERMAP (v18081) and ISCST3 (v02035)
 - Source type: POINT, VOLUME, AREA, CIRCULAR AREA, LINE AREA, OPENPIT, LINE
 - Incorporated Indian regulatory requirements
 - Inbuilt meteorological data processor
 - Wind rose plot and overlay on isopleth.
 - Inbuilt Indian Terrain Elevation Data
-

- Integrated emission factor calculators
- Export to Google Earth™
- Report-ready output/summary
- Overlay isopleth on sitemaps

ISCST3 Model

Area/ Line Area sources resembling loading, transportation in mine site were set up in the ISCST3 model. Grid receptors were set up in 10km radius for prediction of incremental concentrations. The model was run for 24-hour duration. The predicted incremental concentrations of pollutants were added to corresponding baseline concentrations to obtain the cumulative concentration level at baseline stations.

Input of Model:-

The air pollution caused by the fugitive emissions from a mine lease is a local phenomenon. Its impact will occur at a distance ranging from within the immediate vicinity of the lease area to 2.5 km away from the area. To evaluate the impact on air quality following data is required to input in simulation.

- Co-ordinates (X & Y) of sampling location within study area,
- Micro-metrological data such as Cloud Cover, Temp (°C), Relative Humidity (%), Wind Direction (Deg), Wind Speed(km/h), Hourly Precipitation for study period (January-March 2026)
- Predicated fugitive emission rate after taking of pollution control measures.

OUTPUT OF ISCST-3:-

The simulation was made to evaluate incremental short-term concentrations of Particulate Matter (SPM) to be emitted from mining project. In the short-term simulations, the incremental concentrations were estimated to obtain an optimum description of variations in concentrations within study area.

Output of the simulation is as under:-

- Maximum Ground Level Concentration (GLC),
- Isopleths of Pollutant PM, NOx & CO.

From the output of the ISCST3 dispersion model, the highest/maximum ground level concentration can be worked out, which will indicate the incremental value in that pollutant. The mine lease area is considered as source to predict the impact on ambient air quality during the operational phase. The prediction has been done by using ISCST- 3 based on Gaussian Plume Air Dispersion model.

4.9.4 Methodology

Emission of PM10

The major sources of PM10 emission in case of Sand, Stone and Bajri mining project are the loading activity at mine site (loading of material over trucks / trucks by excavators) and the movement of vehicles on unpaved haul roads. The emission rates for these sources are given in latest USEPA's AP-42 guidelines.

Loading of Material

The stone bajri & sand will be loaded on trucks using excavators. 5 to 8 excavators will be used for loading total 250 MT/Day of material during the working of 8 hours/day. The PM₁₀ emission rate due to loading activity is calculated.

$$E = k \times 0.0016 \times \left(\frac{u}{2.2} \right)^{1.3} \left(\frac{M}{2} \right)^{1.4}$$

Where,

E = Emission Factor, kg/ton

k = Particle size multiplier, 0.35 for PM10

M = Moisture Content, %

u = Mean wind speed, m/s

4.9.5 Emission of PM10 due to Transportation

The hauling of sand from the mine lease area to the end users via haul road (unpaved road) will cause emission of particulate matters. This emission will be limited to the extent of unpaved haul road starting from mining pit to nearest paved road connectivity. As per the mining plan the material will be transported during the working only. Each day maximum 5 to 10 trucks tripper/ tractor trolley to ply in an hour for transportation of materials and capacity 9 tonnes each will make 28 trips/day for transporting Sand, Stone and Bajri from mine to end user. The loaded tractor trolleys/trucks would carry the material (Stone) will be transported to the stone crusher and after that it will be transported to market for sale along with Sand and Bajri.

The following empirical expressions is used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road in industrial sites, per vehicle mile travelled.

(VMT).

$$E = k \left(\frac{s}{12}\right)^a \left(\frac{W}{3}\right)^b + C$$

where,

k, a, b are empirical constants i.e., different for different particle size.

E = size-specific emission factor (lb/VMT)

s = surface material silt content (%)

W = mean vehicle weight (tones)

C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

In NAAQS (2009) the PM10 concentration standard is given at 24-hour averaging time, the model was used to predict 24-hour GLC using Turner Equation2.

Emission of NOx from Vehicles- There will be no source of NO2 emission from mining except from vehicles. The ARAI emission factors for NO2 emitting from heavy vehicles (diesel) is 6.53 gm/km or 10.51 g/mile/vehicle.

Emission of SO2 from Vehicles- There will be no source of SO2 emission from mining. Also, there is no emission factor defined for exhaust emission of SO2 from diesel vehicle. Further, the model also does not have the option for modelling SO2 emissions from vehicle exhaust.

4.9.6 Meteorology:-

- Wind speed
- Wind direction
- Ambient temperature
- Stability class
- Mixing height

Boundary Conditions:-

Pollutant concentrations at the domain boundaries which reflect transport from outside the region modelled.

Meteorological Parameters

Surface meteorological data at the project site was collected for January to March 2026. The hourly meteorological data considered during this period were:-

- Wind speed & direction.
- Ambient atmospheric temperature.
- Cloud cover.

- Relative humidity.

The following parameters were considered for dispersion modeling of the area source.

- Quantity of per day production.
- The Emission rate of pollutants.
- No. of trucks used for transportation per day and provision to control fugitive emission.

Source of Emission

- ❖ Area of mine- PM₁₀, CO & NO_x

Assumptions

The dispersion modeling assumptions considered are as follows:-

- The fugitive emission rate for PM was calculated based on rate of production per day and transportation of mined out material.
- The terrain of the study area was considered rocky.
- The mathematical equations used for the dispersion modeling assumes that the earth surface acts as a perfect reflector of plume and physico-chemical processes such as dry and wet deposition and transformation of pollutants are negligible.

TABLE 4-2: EMISSIONS RATES

S.No.	Activities	Units	Emission Factor
1.	Loading	Kg/tonne	0.000495
2.	Transportation on Haul Road (PM10 Emission)	g/mile/vehicle	80.28034
4.	Transportation (NO _x Emission)	g/mile/vehicle	10.51
5	Transportation (CO Emission)	g/mile/vehicle	6.32

4.9.7 Incremental Increase and resultant Concentration

For the impact assessment, the more relevant determination for anticipated pollutants

is the incremental increase in the background concentration rather than the determination of maximum GLC values. In the present study, an attempt has been made to determine the increase in the concentration of PM₁₀, CO & NO_x for receptors where the ambient air quality stations were established through a substitution of relevant data in the model.

Ambient air quality monitoring was carried out during ((January to - March 2026)) including project site.

4.9.8 Equal Concentration Contour Plots (Isopleths):-

The maximum of 24 hourly highest GLC's of PM₁₀, and NO_x during mining operation (Areasource) is summarized in **Table 4-3**.

TABLE 4-3: SUMMARY OF AREA/LINE AREA SOURCE MODELING

Sr. No.	Pollutants	1st Maxm. Incrementale Levels (µg/m³)	Distance (m)	Direction	Land use area of deposition
1	PM ₁₀ -worst	2.93	200	SSW [200°]	Near project area
	PM ₁₀ -control	1.54	200	SSW [200°]	Near project area
2	NO _x	0.73	200	SSW [200°]	Near project area
3	CO	1.05	200	WSW [240°]	Near project area

4.9.9 Resultant Concentration after Implementations of the proposed establishment of the plant:-

The cumulative impact on baseline ambient air quality, after the Implementation of the proposed plant has been arrived at by superimposing the present baseline maximum air quality levels of each pollutant. The resultant ambient air quality after the Implementation of the proposed plant is given in **Table- 4-4**.

TABLE 4-4: PREDICTED MAXIMUM CUMULATIVE SHORT-TERM GROUND LEVEL CONCENTRATION

Pollutants	1st Max^m.	Location	Max. AAQ	Resultant	
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	Incremental Concentration (µg / m³)	Distance in Meter	Direction	Concentration Recorded within project area during study period (µg / m³)	Concentration (µg / m³)	NAAQS Standard (µg / m³)
PM₁₀-worst	2.93	200	SSW	49.35	52.28	100.00
PM₁₀- control	1.54	200	SSW	49.35	50.89	100.00
NO_x	0.73	200	SSW	14.33	15.06	80.00
CO	1.05	200	WSW	0.64	1.69	.....

The predicted GLCs of Pollutants after the commissioning of the proposed project area are not significant to add up to the existing ambient air quality. However, the proposed air pollution control systems will further improve the existing ambient air quality and help in bringing down the concentrations in ambient air quality.

The estimated cumulative GLCs after the commissioning of the proposed project are found to be within the National Ambient Air Quality Standards 2009 prescribed by CPCB. The incremental concentrations of CO and NO_x are likely to be well within the AAQ standards. However, the baseline concentrations of PM₁₀ were also within the AAQ standard. The incremental concentration of the PM₁₀ is not as much due to the proposed project.

The maximum incremental concentration of PM₁₀ is 2.93 µg/m³ in worst-condition and is 1.54 µg/m³ in control-condition, NO_x 0.73 µg/m³ and CO 1.05 µg/m³ at a distance of 200 m towards the SSW/ WSW direction near the project area, it will decrease with the increase in distance. Thus, the impact of the proposed project on air quality is not much significant. The resultant concentration of contour map are shown in Figure below.

Hence, it can be concluded that the impact on Ambient Air Quality of the nearby areas by the proposed project will be insignificant.

However, proper and effective air pollution control measures will be adopted to minimize and control the adverse impact due to proposed project.

4.9.10 Wind Rose Diagram

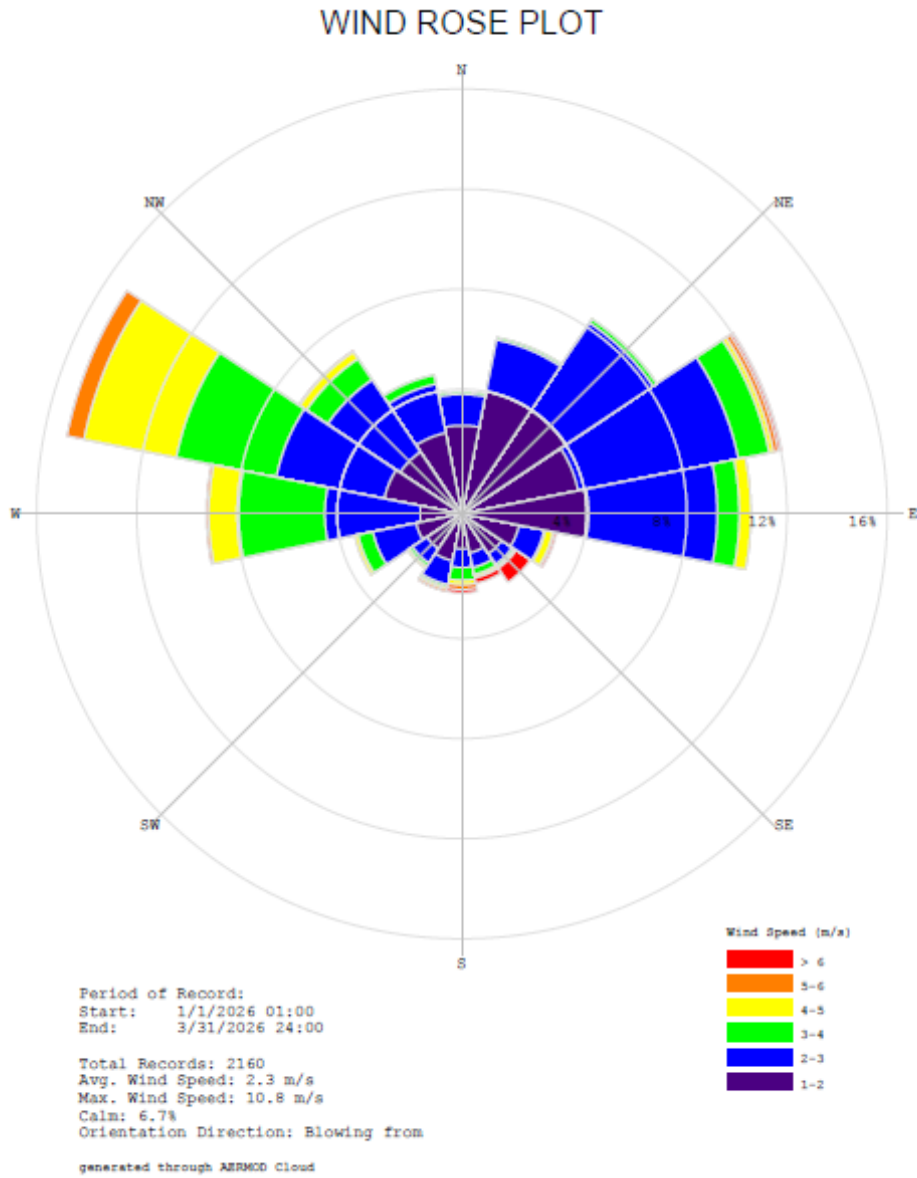


FIGURE 4-1: WIND-ROSE DIAGRAM (Jan-Mar 2026)

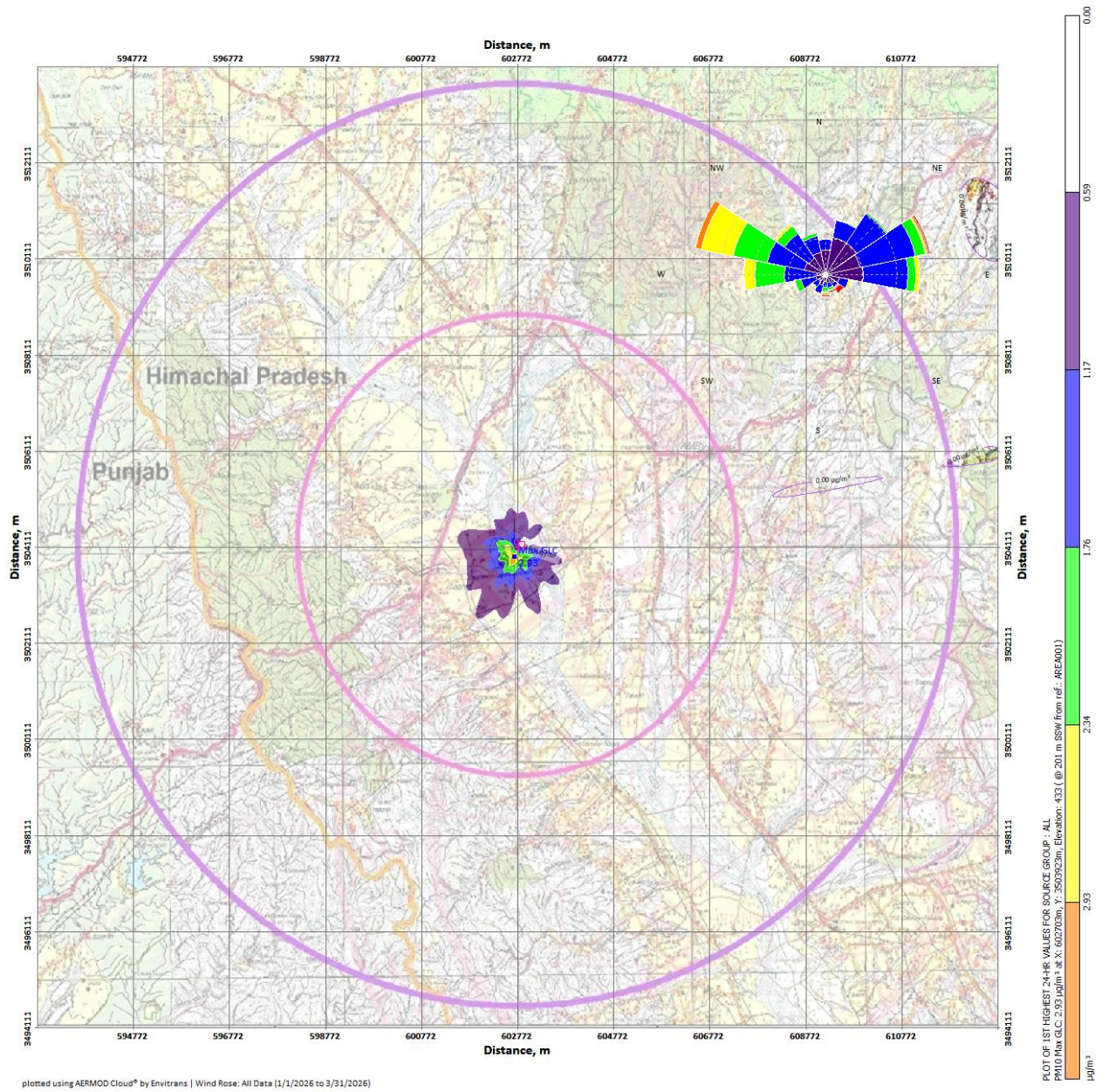


FIGURE 4-2 SPATIAL DISTRIBUTION OF PREDICTED GLCs of PM₁₀ (WORST CASE) DUE TO MINING ACTIVITY

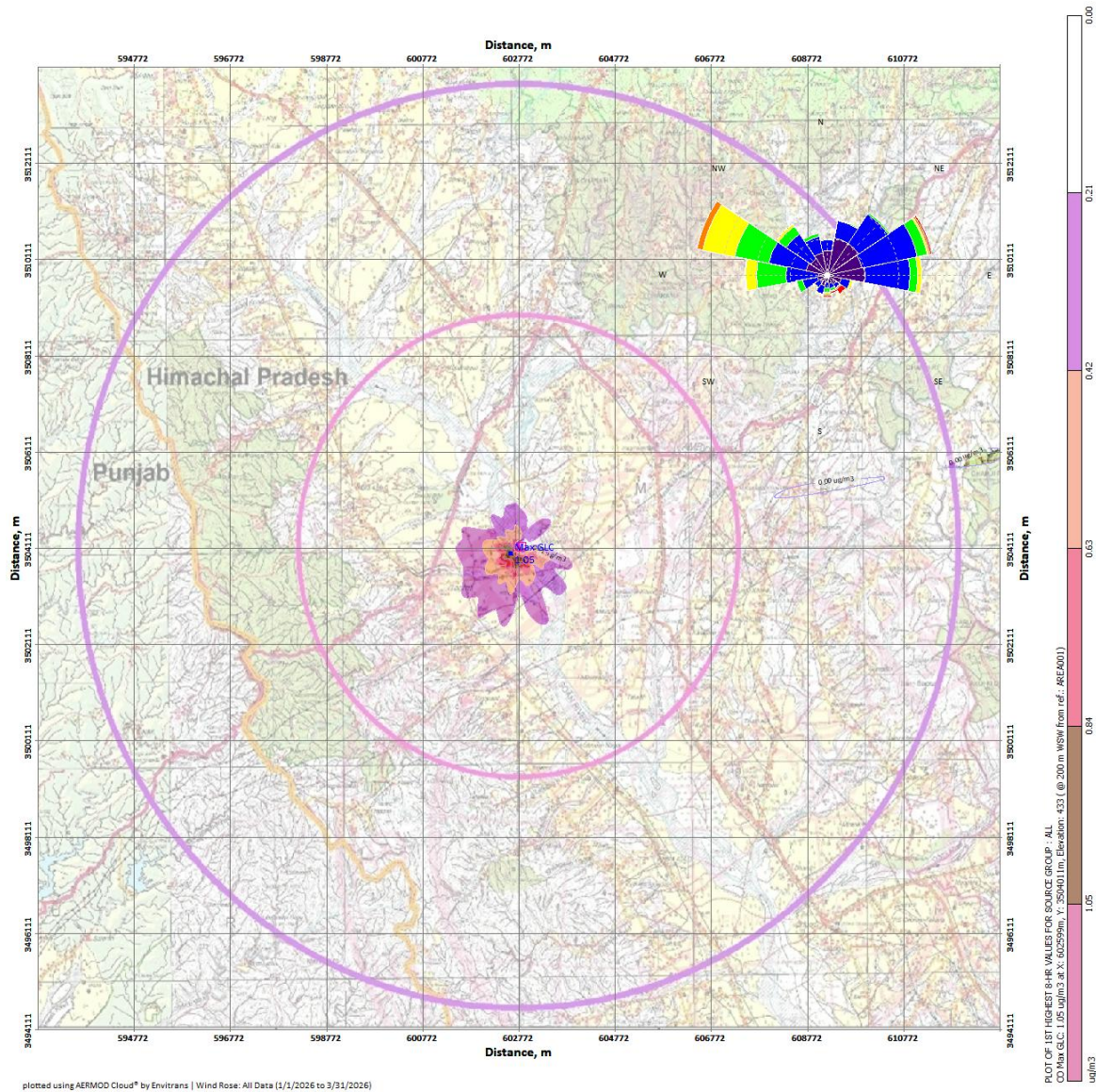


FIGURE 4-5: SPATIAL DISTRIBUTION OF PREDICTED GLCs of CO DUE TO MINING ACTIVITY

4.9.11 Prediction of Incremental GLC of Pollutants on Air Environment

The incremental increase in ground-level concentration (GLC) of PM₁₀ resulting from mining operations (area/line sources) is presented in **Table 4-5**. The National Ambient Air Quality Standards (NAAQS) are provided in the subsequent table for comparison.

TABLE 4-5: HOURLY HIGHEST INCREMENTAL INCREASE IN GLC

S.No.	Within project area	Pollutant	98th Percentile Baseline Concentration ($\mu\text{g}/\text{m}^3$)	Incremental GLC ($\mu\text{g}/\text{m}^3$)	Total Predictive GLC ($\mu\text{g}/\text{m}^3$)	NAAQS Concentration Limit ($\mu\text{g}/\text{m}^3$)
1	Within project area	PM ₁₀ -worst	49.35	2.93	52.28	100
2	Within project area	PM ₁₀ -control	49.35	1.54	50.89	100
3	Within project area	NO _x	14.33	0.73	15.06	80
4	Within project area	CO	0.64	1.05	1.69	.....

4.9.12 Conclusion

It is noted that the maximum impact zone is within 200 meters radial zone from the mine lease area because of wind speed and low concentration. The modeling study proved that the air emissions from the proposed project of mining having ~250 TPD or 67500 TPA would not affect the ambient air quality of the region in any significant manner. The ambient air quality around the project site will remain well within the NAAQS limit. NAAQS are indicative air quality criteria that are adequate to protect the human health and vegetation. The maximum PM₁₀ is 2.93 $\mu\text{g}/\text{m}^3$ in worst-condition and is 1.54 $\mu\text{g}/\text{m}^3$ in control-condition, NO_x 0.73 $\mu\text{g}/\text{m}^3$ and CO 1.05 $\mu\text{g}/\text{m}^3$ at a distance of 200 m towards the SSW/ WSW direction near the project area, it will decrease with the increase in distance.

SO₂ - There will be no source of SO₂ emission from mining. Also, there is no emission factor defined for exhaust emission of SO₂ from diesel vehicle.

- All activities related to mining i.e. and transportation loading are contributing to the air emission load due to proposed project. However, the increase would be marginal. The cumulative emission levels of PM₁₀ and will not go beyond the threshold limit of NAAQS.
- The concentration NO_x due to vehicle exhaust is very low concentration due to small number of vehicles plying on haul road.
- The concentration CO due to vehicle exhaust is very low concentration due to small number of vehicles plying on haul road.
- The concentrations of SO₂ from mining area and transportation are expected to be low due to absence of any major source.

- The isopleths for the different modelling conditions are illustrated in **Figure-4-2** to **Figure-4-5**.

4.9.13 Mitigation Measures

- The drop height during loading and unloading shall be maintained just above the truck height.
- Trucks shall not be overloaded.
- Regular water sprinkling on haul roads shall be used for suppression of dust.
- Strict speed limits shall be imposed on trucks/vehicles.
- Water sprinkling system shall be installed at locations of unloading.
- Multiple transportation routes in different directions shall be planned to minimize dust generation.
- Planning paved roads outside mine lease area to minimize the dust generation.
- Alternatively, planning transportation routes so as to reach the nearest paved roads by shortest route. (minimize transportation over unpaved road).
- Plantation of trees along haul roads, and near settlements, to help to reduce the impact of dust on the nearby villages.
- Transportation of material shall be carried out during daytime only.
- Covering of material during transportation on trucks to prevent spillage from the trucks. The trucks shall be covered by tarpaulin.

4.9.14 Air Quality Index

The table given below shows the Air Quality Index (AQI) range & category:-

TABLE 4-6: AIR QUALITY INDEX (AQI)

Good (0-50)	Minimal Impact	Poor (201-300)	Breathing discomfort to people on prolonged exposure
Satisfactory (51-100)	Minor breathing discomfort to sensitive people	Very Poor (301-400)	Respiratory illness to the people on prolonged exposure
Moderate (101-200)	Breathing discomfort to the people with lung, heart disease, children and older adults	Severe (>401)	Respiratory effects even on healthy people

Source: CPCB AQI calculator

The Minister for Environment, Forests & Climate Change Shri Prakash Javadekar launched The National Air Quality Index (AQI) in New Delhi on 17th September 2014 under the Swachh Bharat Abhiyan. It is outlined as 'One Number One Colour-One

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Description' for the common man to judge the air quality within his vicinity. The index constitutes part of the Government's mission to introduce the culture of cleanliness.

Air Quality Index (AQI) is one such tool for effective dissemination of air quality information to people. As such an Expert Group comprising medical professionals, air quality experts, academia, advocacy groups, and SPCBs was constituted, and a technical study was awarded to IIT Kanpur. IIT Kanpur and the Expert Group recommended an AQI scheme in 2014.

There are six AQI categories, namely Good, Satisfactory, moderately polluted, Poor, Very Poor, and Severe. The proposed AQI will consider five pollutants (PM10, PM2.5, NOx, SOx, and Free Silica) for which short-term (up to 24-hourly averaging period) National Ambient Air Quality Standards are prescribed. Based on the measured ambient concentrations, corresponding standards and likely health impact, a sub-index is calculated for each of these pollutants. The worst sub-index reflects overall AQI.

AQI to be calculated by using the pollutant concentration data, the following table, and the following equation (linear interpolation):-

$$I_p = \frac{I_{Hi} - I_{Lo}}{BP_{Hi} - BP_{Lo}} (C_p - BP_{Lo}) + I_{Lo}$$

Where,

I_p = the index for pollutant p

C_p = the rounded concentration of pollutant p

BP_{Hi} = the breakpoint that is greater than or equal to C_p
 BP_{Lo} = the breakpoint that is less than or equal to C_p
 I_{Hi} = the AQI value corresponding to BP_{Hi}

I_{Lo} = the AQI value corresponding to BP_{Lo}

TABLE 4-7 SUMMARY OF RESULTS HOURLY AQI IS DEVIDED INTO SIX CATEGORIES.

Air Quality index (AQI) values	Levels of healthconcern	Description	Color
0 - 50	Good	Minimal Impact	Dark Green
51 - 100	Satisfactory	Minor breathing discomfort to sensitive people	Light Green

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101 – 150	Moderate	Breathing discomfort to the people with Lung, heart disease, children, and other adults.	Lemon Yellow
151- 200	Poor	Breathing discomfort to people on prolonged exposure	Yellow
201 – 300	Very Poor	Respiratory illness to the people on prolonged exposure	Red
301 - 500	Severe	Respiratory effects even on healthy people.	Brown

**Source:- Central Pollution control board series CUPS/8z/2014-15*

TABLE 4-8 AIR QUALITY INDEX OF 10 KM BUFFER AREA

Sr. No	Monitoring stations	PM10	PM2.5	SO ₂	NO ₂	CO	AQI value
1	Project Site AA1	49.35	28.05	9.40	12.47	0.22	49
2	Mohkampur Nawada AA2	45.63	26.23	13.89	14.13	0.64	46
3	Kanhu Wala AA3	42.78	25.19	13.06	14.13	0.52	43
4	Dhakrani AA4	43.58	25.71	09.88	14.33	0.46	44
5	Manpur AA5	41.63	24.56	09.68	12.85	0.51	42
6	Nawada AA6	40.76	22.01	08.63	13.63	0.36	41
7	Shivpur AA7	48.57	27.41	09.52	14.06	0.45	49
8	Dudhla AA8	44.27	24.68	09.18	13.78	0.52	44

The Air Quality Index (AQI) across eight monitored locations in the study area has been recorded as good to satisfactory. AQI values for all four parameters were calculated based on running 8-hour averages, indicating overall satisfactory air quality. Within the 10 km radius of the project site, the primary pollutants contributing to air quality levels are PM10 and PM2.5. The maximum AQI observed in the project area is attributed to these parameters, yet the ambient air quality remains within the satisfactory category.

4.10 NOISE ENVIRONMENT

The proposed mining activity is manual in nature. No drilling & blasting is to be used for the mining activity. Hence the only impact anticipated is due to the movement of vehicles deployed for transportation of minerals.

4.10.1 Anticipated Impacts

The exposures to excessive noise levels can lead to:-

- Disturbed sleep, insomnia, and fatigue.
- Decrease in speech reception, communication.
- Distraction and diminished concentration thus adversely affecting the performance efficiency.
- Potential cardiovascular, respiratory, and neuralgic damages in certain extreme cases.

4.10.2 Mitigation Measures:-

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

- Limit vehicle movement to daytime; maintain equipment; provide quiet rest shelters.
- Install noise barriers; mandate ear protection; rotate shifts to reduce exposure.
- Allow regular breaks; train workers on noise risks; use acoustic insulation in work areas.
- Ensure only PUC-certified vehicles are operated
- Minimize use of sharp horns.

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

TABLE 4-9 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 1/2	102	
1	105	
3/4	107	
1/2	110	
1/4	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. The area in general represents calm surroundings. There is no heavy traffic, industry, or noisy habitation near the proposed leased mining area. As there will be no heavy earth moving machinery there will not be any major impact on noise level due to proposed mining and other associated activities. A detailed noise survey has been carried out, and results were cross-referenced with standards and were found to be well within limits. Blasting technique shall not be used for lifting of sand and stone, hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noisy environment of the region. The only impact will arise from the transportation of sand, stone and trucks to the stone crushing unit. M/s Aadhya Stone Crusher, linked to the proposed mine, is located at a distance of approximately 1.0 km.

TABLE 4-10 AMBIENT NOISE LEVEL OF STUDIED AREA

Sr. No.	Location Name	Results		Method
		Day Time	Nighttime Leq.in dB(A)	
1.	Project Site-N1	55.7	42.5	IS: 9989:1981R-2002
2.	Ram Mandir, Andora-N2	46.4	35.8	
3.	Katohar Khurd Village Road-N3	52.5	40.6	
4.	Ram Nagar-N4	53.1	42.2	
5.	Jindbar-N5	52.3	44.0	
6.	Gagret main Chowk-N6	47.6	35.1	
7.	Kul Devi Mandir-N7	46.8	38.2	
8.	Gagret Bypass -N8	52.4	43.9	

During mining operation, i.e. collection of stone and loading into transporting vehicle noise levels shall be higher but well within limit of the noise levels in the working area when compared with standards prescribed by occupational safety and health administration (OSHA-USA) and CPCB New-Delhi.

4.11 BIOLOGICAL ENVIRONMENT

Mining on Riverbed involves excavation and removal of surface material, 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. Mining operation generates additional traffic and can lead to ecological impacts. These impacts may include:-

4.11.1 Anticipated Impacts

- Mining may drive away the wildlife from their habitat and significantly affect wildlife and nearby residents.
- Access roads crossing the riparian areas will have an impact on the species disturbing the ecosystem
- Diminution of the quality and quantity of habitat is essential for aquatic and riparian species.
- Reduction in the yield of agriculture due to deposition of dust on the leaves, etc. of the crops.
- Mining on the streambed, braided flow or subsurface inter-sand flow may hinder the movement of fishes between pools.

4.11.2 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:-

- ❖ It will be ensured that no mining activity will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
- ❖ As the mining site has no vegetation, no clearance of vegetation will be done.
- ❖ Prior to closure of mining operations/during the rainy season the eroded bank will be restored/reclaimed to minimize negative impacts on aquatic habitats.
- ❖ Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
- ❖ Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
- ❖ No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
- ❖ No nighttime mining will be allowed, which may catch the attention of wildlife.
- ❖ Workers will be made aware of the importance of wildlife and signage will be displayed in the sensitive areas to caution the workers & other passerby.

4.11.3 Green Belt Plantation

- a. Characteristic features of plants to be used for Absorption of pollutant gases:-** Plant species should be perennial and evergreen with thick canopy covers. The crown of tree (mass of foliage/leaves and branches growing outward from the trunk of the tree) should be either Oblong, Round or Spreading for effective absorption of pollutant **gases**.
-

b. Plantation technique:- The plant species should be planted using pitting technique. The pit size should be 45cm X 45cm X 45cm for Shrubs and 70cm X 70cm X 70cm for trees. Soil used for filling the pit should be mixed with well decomposed Farmyard Manure (FYM) or Sewage sludge at the rate of 2.5 kg (on dry weight basis) and 4 kg (on dry weight basis) for shrubs and trees respectively. The filling of soil should be completed at least a week before actual plantation.

The pits measuring 70cm X 70cm X 70cm for trees are to be dug up at desired points in triangular pattern. For planting tall shrubs and dwarf trees 4.5m spacing between the plant rows is sufficient while medium and tall trees in middle and rear rows are to be planted 6-7 m and 7-9 m respectively depending upon the space available.

c. Three Tier System for Plantation:- Close planting keeping dwarf trees with round canopy exposed to the source of emission followed by medium and tall trees with cylindrical canopy is ideal for the present situation.

Planting trees in staggering arrangements in multiple rows across the direction of the wind is recommended for better trapping and absorption of pollutants. The trees of the front row act as absorptive layers while the core area (rear rows) cleans the air. The width of the outer area of the plantation should be 3-4 times wider than the core area depending upon the availability of the space.

Though, the study area harbours good diversity; some species for green belt development are suggested, which are summarized as below:-

TABLE 4-11 LIST OF PLANT SPECIES SUGGESTED FOR GREENBELT DEVELOPMENT

Sr. No.	Botanical name	Local name
1.	Dalbergia sissoo	Shisham
2.	Acacia catechu	Khair
3.	Azadirachta indica	Neem
4.	Mangifera indica	Mango
5.	Dendrocalamus strictus	Bamboo
6.	Ocimum sanctum	Tulsi
7.	Ficus religiosa	Peepal
8.	Syzygium cumini	Jamun
9.	Terminalia arjuna	Arjun
10.	Aloe vera	Aloe vera

4.11.4 Management & Conservation Measures for Biodiversity

It is an irrefutable scientific fact that there cannot be any developmental activity which is completely devoid of causing any environmental impact. Industrial sectors too are no exception to that. However, it is also a fact that environment is a dynamic entity and has a built-in during the Mining operations are likely to settle down in the core area premises.

The biodiversity is a resilient entity of the environment and can tolerate impacts and recuperate if their renewal mechanisms are unaffected over a long period of time. Therefore, focus should be laid on ensuring that the renewal dynamics of various floral and faunal taxa is not impeded by the mining activity.

Green belt will be developed according to CPCB guidelines. Plants of various species will be developed in the plant and peripheral areas. The Mine waste will be used for Plantation by planting local trees and bushes. Plantation shall be done in 1.0 ha area, and 1200 trees shall be planted (1200 trees/hectare) along with grass. The improvement in the agricultural production will also increase the vegetal cover in the surrounding area. This when coupled with Greenbelt development/ plantation is a favourable and eco-friendly measures to reduce the impact of the proposed mining activity on the biodiversity of the area.

Adequate measures will be adopted as a part of the Environmental Management Plan (EMP) to prevent entrainment of fugitive dust emissions. Thus, adverse impacts due to fugitive emissions are not expected to be significant.

This requires sensitization of stakeholders at various level involved in the process of development to realize the importance of biodiversity and the role biodiversity in maintaining the ecological balance. Practically this can be achieved by:-

- ✓ Scaling up the Green Belt development in and around the site.
- ✓ Controlling the fugitive emissions and other airborne pollutants by appropriate technology at point source.
- ✓ Adherence to the strategies outlined in the EMP.
- ✓ Using paved roads for transportation to minimize fugitive emissions.
- ✓ Emission of particulate matter during operation phase will be controlled at source by using appropriate pollution control devices as per the CPCB guidelines.
- ✓ Maintain the preferred routes of animal's movement.
- ✓ Signboards in fluorescent ink should be placed along the major animal's route to make them readable in night-time.
- ✓ Built a clause in contract document for the contractor that would not permit the labours, workers, supervisors, contractors, and other employees to collect and utilize forest produce, including firewood. Frequent visits to the forest habitats for collection of resources might scare the wildlife and may also result in human - wildlife conflict.
- ✓ Creating a live hedge of sturdy woody shrubs along the periphery of treatment facility to restrict the wildlife to enter treatment facility. Closely packed *Azadirachta indica*, *Cassia fistula*, *Delonix regia*, *Opuntia*, *Ziziphus* can be used for the purpose.
- ✓ Educational and awareness drive in the labour camps to ensure traps are not laid by the labours for trapping small animals.
- ✓ Weed control method should be conformed to the ecological conservator officer to prevent any undesirable secondary impact.
- ✓ Removal or picking of any protected or unprotected plants shall not be permitted.
- ✓ The grass mix should consist of indigenous grasses adapted to the local environment conditions.

- ✓ In the event of animals present and pose a risk to human safety, a suitable animal handler must be requested to catch the animal in a friendly and responsible manner. This specifically refers to the snakes and scorpions.

4.12 SOLID & HAZARDOUS WASTE

During riverbed mining as such no solid & hazardous waste will be generated. Nominal amount of domestic waste will be generated at the mine site by the workers which will be disposed off by municipal way. Silt/Clay will be generated during the mining of sand, stone & bajri which will be further used for back-filling purpose and also plantation purpose along the roadsides & crusher site.

4.13 TRAFFIC ANALYSIS

Vehicle movement on riverbed may increase traffic congestion and accident risks. Proper route planning and regulated transport schedules will minimize these impacts.

4.13.1 Transportation Route

The excavated minerals will be directly loaded into trucks and trolleys, transported to the crushing unit for processing into the required grit, and then dispatched to the market or end users. A single evacuation route has been proposed to streamline transportation and distribute traffic load, thereby minimizing congestion.

Traffic Management

1. Roads will be repaired regularly and maintained in good conditions.
2. Regular sprinkling of water to control dust emission.
3. Traffic movement will be regulated near the site.
4. Speed breakers will be constructed accident prone areas to calm the traffic and its speed.
5. Signage will be erected at the sensitive & precarious places to caution or provide information to road user.

4.14 SOCIO-ECONOMIC ENVIRONMENT

4.14.1 HUMAN SETTLEMENT

The villages and their inhabitants in the buffer zone will not be disturbed from their settlements due to the mining operations. There is no inhabitation within the lease area. Therefore, neither villages nor any part of village or any hamlet will be disturbed during the entire life of the mine. As the mining operations will not disturb or relocate any village or settlement, no adverse impact is anticipated on any human settlement.

4.14.2 SENSITIVE TARGETS

There are no places of Tourist, religious & historical importance in core zone.

4.14.3 SOCIO ECONOMIC STATUS

There are some people who are engaged in trading of Sand, Stone and Bajri Therefore, due to mining of these minerals the per capita income of local people has been improved. The job/business opportunities have improved the economic condition of the people. They are able to utilize this money for purchase of tractors, trucks, jeeps, etc., which may be put into use for business purposes. Part of money has also been utilized in starting of some business as per person's skills.

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. The proposed mining project is well recognized by the local population. The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if they are not involved in the proposed mining operation or the project is shelved.

4.15 CONCLUSION

All possible environmental aspects have been adequately assessed, and necessary control measures have been formulated to meet statutory requirements. Thus, implementing this project will not have any appreciable negative impacts.

5 ANALYSES OF ALTERNATIVES (TECHNOLOGY & SITE)

5.1 GENERAL

Consideration of alternatives to a project proposal is a requirement of the EIA process. During the scoping process, alternatives to a proposal can be considered or refined, either directly or by reference to the key issues identified. A comparison of alternatives helps to determine the best method of achieving the project objectives with minimum environmental impacts or indicates the most environmentally friendly and cost-effective options.

5.2 ALTERNATIVE FOR MINE LEASE

Site: The Mining is Naturally a site-specific activity, and the lease has been granted for this designated location based on the availability of mineral resources. Therefore, no alternative site has been considered or proposed.

5.3 ADVERSE IMPACTS

- Disturbance to aquatic habitat due to human activity.
- Increased turbidity affecting water quality.
- Occupational health risks to workers.
- Limited extraction capacity may lead to illegal mining.

5.4 MITIGATION MEASURES

- ❖ Restrict mining to non-monsoon periods.
- ❖ Provide PPE and training to workers.
- ❖ Designate specific zones for mining after leaving safety zone
- ❖ Regular monitoring of water quality and biodiversity.

6 ENVIRONMENTAL MONITORING PROGRAMME

6.1 GENERAL

The monitoring and evaluation of environmental parameters indicates potential changes occurring in the environment, which paves way for implementation of rectifying measures wherever required to maintain the status of the natural environment. Evaluation is also a very effective tool to judge the effectiveness or deficiency of the measures adopted and provides insight for future corrections.

The main objective of environmental monitoring is to ensure that the obtaining results in respect of environmental attributes and prevailing conditions during operation stage are in conformity with the prediction during the planning stage. In case of substantial deviation from the earlier prediction of results to identify the cause and suggest remedial measures. Environmental monitoring is also mandatory to meet compliance of statutory provisions under the Environment (Protection) Rules, 1986, relevant conditions regarding monitoring covered under EC orders issued by the SEIAA as well as the conditions set forth under the order issued by State Pollution Control Board while granting CTE/CTO.

6.2 AREAS OF CONCERN

In case of mining projects, the changes relating to water, aquatic biota, air, noise, biodiversity of the area, stability of pit slopes, river hydraulics and plantation programme need special attention, from monitoring point of view, during the conceptual mine plan period to judge the efficiency of measures implemented for conservation of environment.

6.3 ENVIRONMENTAL MONITORING PROGRAMME

All the environmental parameters viz. air, water, noise, and soil will be monitored regularly in order to detect any changes from the baseline status. Environmental Monitoring program will be followed till the mining operations ceases.

6.3.1 Air Quality Monitoring

Air Quality monitoring is essential for evaluation of the effectiveness of abatement programmes and to develop appropriate control measures. The project proponent will monitor ambient air quality in and around the proposed ordinary sand mining projects at a frequency of once in a fortnight or any other frequency as stipulated by MoEF and take appropriate air pollution control measures in order to ensure that the concentration of PM_{2.5}, PM₁₀, SO₂, NO₂ and CO are within limits.

6.3.2 Water Quality monitoring

Water quality monitoring involves periodical assessment of quality of surface water and the ground water near the mine site. Surface water samples will be analyzed for all the parameters

as per EPA, 1986 ground water samples will be analyzed for all the parameters as per IS-10500. Phreatic surface levels will be monitored throughout the life of the project to study the impact of mining operations on the ground water regime. A network of observation wells will be located in the villages around the projects area for monitoring of phreatic surface levels. The water levels will be monitored during pre-monsoon and post-monsoon seasons four times in a year.

6.3.3 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 noises control of various noise generating sources.
- c) Correlation of noise levels with community response to noise levels.

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 nearby villages for studying the impact due to higher noise levels for taking necessary control measures at the source.

TABLE 6-1 MONITORING SCHEDULE AND PARAMETERS

Sr.No	Aspect	Parameters to be monitored	Frequency
1	Air Quality monitoring	PM10, PM2.5, SO2, NO2, Free Silica	As per CPCB/ SPCB requirement on monthly
2	Noise Quality monitoring	Leq for day and night	As per SPCB/ MoEF & CC requirements of compliance
3	Water Quality Monitoring	Comprehensive monitoring as per IS:10500 Groundwater level (mbgl) and Surfacewater quality as per IS2296:1991	Periodic during operation phase as per SPCB/ CPCB guidelines
4	Soil	Organic matter, Texture, pH, EC, Permeability, Water holding capacity, porosity etc.	Periodic during operation phase as per SPCB/ CPCB guidelines
5	Plantation	Plants and shrubs in the Green belt area and their mortality status	Periodic during operation phase as per SPCB/CPCB compliance requirements
6	Erosion and Bank Stability	Conditions of pit slope	Before monsoon and post monsoon every year

7 ADDITIONAL STUDIES

7.1 GENERAL

Mining and allied industries are prone to various hazards and disasters that can impact workers, infrastructure, and nearby communities. It is essential to identify project-specific risks and implement preventive measures. Safe working conditions and environmental safeguards must be ensured. A robust framework for risk assessment, emergency preparedness, and compliance with safety regulations is vital for sustainable operations.

7.2 PUBLIC CONSULTATION

In compliance to provision of the EIA notification dated 14.9.2006, the copy of Draft EIA report and Executive summary in English & Hindi is being submitted to Himachal Pollution Control Board for the conduct of public hearing.

7.3 IDENTIFICATION OF RISK & HAZARDS

The mining of sand, stone and bajri will be done manually so there will not be any major risk hazard associated with the process. The possible scenarios selected for this project are as below:-

- Accident during sand loading, transporting, and dumping.
- Accident due to vehicular movement
- Occupational injuries
- Possibility of earthquake
- Fires on large surface vehicles through ignition of fuel/Hydraulic fluids

7.3.1 Inundation/Flooding

The consequences of flooding/inundation are catastrophic or fatal. The likelihood of occurrence of flooding is occasionally possible. As per mining plan, the mining work will not be carried out during monsoon season. The likelihood of occurrence of drowning is rare due to dry season mining.

7.3.2 Accident due to vehicular movement

The consequences of this scenario are moderate and may result in hospitalization and day loss. The likelihood of occurrence is occasionally possible.

7.4 RECOMMENDATION FOR RISK REDUCTION

7.4.1 Measures to prevent Inundation/Flooding

- Being on riverbed there should not be any mining operation during monsoon or rainy day.
- Formation of deep pits should not be allowed.
- Check dams/Retaining wall will be constructed & maintained.
- Mining operation will be prohibited during monsoon season.

7.4.2 Measures to Prevent Accidents during Loading

- The truck should be brought to a lower level so that the loading operation suits the ergonomic condition of the workers.
- The loading should be done from one side of the tractor trolley only.
- The workers should be provided with gloves and safety shoes during loading.
- Operations during daylight (9a.m. to 5p m.) only.
- Stockpiling of harvested material on the riverbank should be avoided.
- Necessary first aid kit will be always kept in the mine site.

7.4.3 Measures to Prevent Accidents during Transportation

- Vehicles must be periodically checked and maintained in good condition and must not be overloaded.
- Overloading should not be permitted
- To avoid danger of accident roads and ramp near embankment should be properly maintained.
- The truck should be covered and maintained to prevent any spillage.
- The maximum permissible speed limit should be ensured.
- The truck drivers should have a proper driving license.

7.4.4 Preventive and Corrective Measures for Occupational Injuries

- Training will be given to the workers in how to use hand equipment.
- First aid will be provided on-site only if any accident occurs.
- In case of poor condition of any equipment, it will be changed immediately.

7.4.5 Preventive and Corrective Measures for Fires on large surface vehicles through ignition of fuel/hydraulic fluids

- Availability of fire extinguishers on-site throughout the operational phase of mine
- Maintenance of vehicles on monthly bases.

7.5 SOCIAL IMPACT ASSESSMENT

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 study area has been considered 10 km radius from the project site. The total 10 Km area

has been divided into three sections. These different sections are namely (0- 3 Km primary Impact area and 3-7 km secondary Impact area and 7-10 km non-impact zone). For the primary survey 0-3 km Impact area has been considered. 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.

7.5.1 Objectives of SEIA

The primary objective of this study is to assess the socio-economic impacts of the proposed mining project on the communities residing in the surrounding areas. It must also be determined whether the anticipated impacts are direct or indirect. Further, it has to be assessed whether the anticipated impacts will be positive or negative.

7.5.2 Scope

The Scope of the study is as follows:-

- To collect baseline data of the study area
- To comprehend socio-economic status of the people living in the study area.
- To assess the probable impact of the project on social and economic aspects in the study area.
- To measure the impact of the project on Quality of life of the people living in the study area.
- To ensure sustainability of positive impact.
- To suggest mitigation measures and identify the responsible or implementation in the event of adverse impacts.

7.6 SOCIO-ECONOMIC IMPACT OF THE PROJECT

7.6.1 Impact on demographic composition

The proposed Mining Project is located at Mauza and Mohal Mohkampur Nawada, Tehsil Paonta Sahib, District Sirmour, Himachal Pradesh 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.

7.6.2 Employment Opportunities

The proposed Project will provide employment to the local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers will be recruited locally. It has been estimated that 15 people will get direct employment in this mining project.

It is a positive impact of the project since it provides employment opportunities to the local people. The project will not affect vulnerable groups of people.

7.6.3 Increased supply of minerals in the market

Both Government departments and private developers have taken up construction of roads, bridges, and buildings in a big way. Hence, the demand for sand, stone & bajri is ever increasing with the growth of the infrastructure development in our country. The requirement for building materials is always high, there is already an acute shortage of sand, Stone and bajri in the market, and the construction industry is the main sufferer. It is a critical component of concrete mixture. It is also used for filtering waste. With the commencement of the proposed mining project the supply of sand, stone & bajri will increase at least in the local market.

7.6.4 Impact on road development

Movement of trucks and other vehicles to and from the mining site is expected to increase when mining starts. The existing roads connecting the quarry with the national highways are connected by metaled and unmetalled roads. Hence, there is a need for road maintenance and repairing regularly in the mining area. Further, there are risks of accidents during loading extracted minerals into tractor-trolleys and transportation to the stone crusher unit for making desirable grit and then send to the markets for sales. However, accidents can be avoided by taking due care and precautions.

7.6.5 Impact on health

There is no chance of diseases occurring, due to manual mining of Sand, Stone & Bajri is non-toxic. However, sand-using activities such as sand blasting require precautions since it creates respiratory problems among mine workers. Excessive inhalation of sand is a serious health concern. To avoid respiratory problems from sand, necessary protection should be taken.

7.6.6 Few safety measures are outlined below:

- a)** It is ensured that the health and safety of all the employees at work will be provided. 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 work arrangements are not hazardous to employees.
- b)** The first aid treatment reflects the hazards associated with the mining of sand, stone, & bajri, the first aiders will be well trained in handling patients working in the above Mining Project.
- c)** For all mine workers a 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)** To meet the medical needs of the mine workers, tie-up with nearest hospitals will be made. This will ensure timely medical aid to the affected persons.

E) For protection from dust it will be made compulsory for all workers to wear masks and gloves while working in the mine.

7.7 CONCLUSION

The Mining of sand, stone and bajri from Mauza/Mohal Ram Nagar in Tehsil Ghanari, District Una, Himachal Pradesh 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, stone & bajri legally valid and it will generate revenue for the state. With the implementation of the project there will be an 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 the opening of the project and associated activities. Also, Proposed CER activity will improve the socio-economic status of the villagers of the study area

8 PROJECT BENEFITS

8.1 BENEFIT OF MINING

The proposed project is mining of sand, stone and bajri from the Riverbed mining, which has no major impact on surrounding environment. The proposed activity shall provide raw material to Stone crusher there by boosting production of construction material. This will bring overall improvement in infrastructure development and economic growth of the area.

- Generating useful economic resource for construction.
- Generating employment and improvement of socio-economic conditions of the study area.

8.2 EMPLOYMENT POTENTIAL

The socio-economic conditions of the surrounding villages indicate that employment generation is seasonal. The occupational activities are agriculture and cattle rearing. The mining activity will provide employment to local people which will increase socio-economic status of the area. Sand, Stone & Bajri are the main raw material for making roads and filling material. The mining activity will provide direct employment to 15 skilled local people and indirect employment of semiskilled and unskilled workers engaged in transportation, trading, and other allied activities, which will improve socio-economic status of the area.

8.3 IMPROVEMENTS IN THE PHYSICAL INFRASTRUCTURE

The proposed sand, stone and bajri and mine will have numerous induced impacts on society such as growth in schools, hospitals, hotels & resorts, transport etc. It will also attract other entrepreneur to establish their venture in the region.

8.4 IMPROVEMENTS IN THE SOCIAL INFRASTRUCTURE

The social infrastructure like religious places (Temple, Mosque, Church, Gurudwara); marriage homes, Bus stations, railway stations, playgrounds will be improved.

8.5 OTHER TANGIBLE BENEFITS

Extraction of Sand, Stone and Bajri and mining has become a widely spread activity and does not require a huge set up or technology, the number of ventures has increased extensively, and it has become a footloose industry in itself, but the backward-forward linkages are becoming stronger as many are getting employed as well as the construction activity/industry requires this mineral at consistent rates.

The sand, stone and bajri extraction in mining industry directly and indirectly provides employment to the skilled or unskilled people which help to improve the economic condition of village. The CER activities and environmental safeguards are taken by the project proponent who helps in further improvement of locality.

8.6 CORPORATE ENVIRONMENT RESPONSIBILITY (CER)

Corporate Environment Responsibility (CER) refers the responsibility of corporate or company or the proponent of any project towards environment and society. The project proponent will spend 2% of the project cost for CER activities. This will be part of the environmental management plan. Activities to be done under CER will be based on the issued raised during public hearing. Activities to be done under CER are given below:-

TABLE 8-1:DETAILS OF THE PROPOSED CER ACTIVITIES

Sr. No.	Activity	Budget (Rs. In Lakhs)
1.	The project proponent will spend 2% of the project cost under CER activities	Rs. 0.20
Total cost of CER		Rs. 0.20

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 GENERAL

Various benefits are envisaged while planning for the mining of sand, stone & bajri from Swan River. Stone, bajri & sand are very important minor mineral and is the principal raw material for meeting the huge demand of construction material required in building construction and infrastructure works, road material for construction and maintenance of roads/highway, elastic ballast material for rail tracks in the State of Himachal Pradesh and nearby cities and towns of Punjab. The natural available materials in shoal deposits of Swan River quarry site have been found suitable from techno-economic consideration.

9.2 SOCIAL INFRASTRUCTURE

- Project will help to channelize the river course.
- Extraction of sand, stone & bajri will help in land cutting from nearby agricultural fields and forests.

9.3 EMPLOYMENT POTENTIAL

- The proposed project will provide direct employment to skilled/unskilled and semiskilled laborers.
- The proposed project will also provide indirect employment to local people in different activities such as transportation, food points, plantation activities, water tanker supply, hand equipment's etc.
- Besides, laborers managerial and administrative staff will also be employed.

9.4 TANGIBLE SOCIAL BENEFITS

- Proponent will undertake awareness program and community activities like health camps, medical aids, family welfare camps, and AIDS awareness programme etc.
- A massive plantation will be built in the surrounding area after consultation with the forest department.

9.5 DIRECT/INDIRECT BENEFITS

- It will generate revenue for the State of Himachal Pradesh.
- It will cater the demand of raw material for construction purpose.

10 ENVIRONMENT MANAGEMENT PLAN

10.1 INTRODUCTION BACKGROUND

The environment management plan has been developed with a view to bringing down the levels of impacts as discussed in the preceding chapters within limits. In each of the areas of impact, measures have to be taken to reduce potentially significant adverse impacts and where these are beneficial in nature, such impacts are to be enhanced/augmented so that the overall adverse impacts are reduced to as low level as possible. Measures to be taken for each of the impact areas are detailed in the following paras:-

The EMP has therefore been made considering implementation and monitoring of environmental protection measures during and after mining operations.

10.1.1 Objectives

The Environmental Management Plan (EMP) for the riverbed mining project is designed to achieve the following objectives:-

- Ensure compliance with environmental regulations and statutory norms related to Riverbed mining activities, including those under the Environmental Protection Act and relevant mining guidelines.
- Implement sustainable mining practices that minimize ecological disturbance, especially to riverine ecosystems, aquatic life, and surrounding habitats.
- Establish clear principles for responsible resource extraction, waste management, and site rehabilitation.
- Conduct awareness programs for workers and staff to promote understanding of occupational health and safety, environmental conservation, and best practices in riverbed mining.
- Adopt mitigation measures to reduce environmental impacts such as air and water pollution, noise, and erosion caused by mining operations.
- Maintain transparent reporting and documentation for submission to regulatory authorities, ensuring accountability and continuous improvement in environmental performance.

10.2 ENVIRONMENTAL MANAGEMENT CELL (EMC)

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

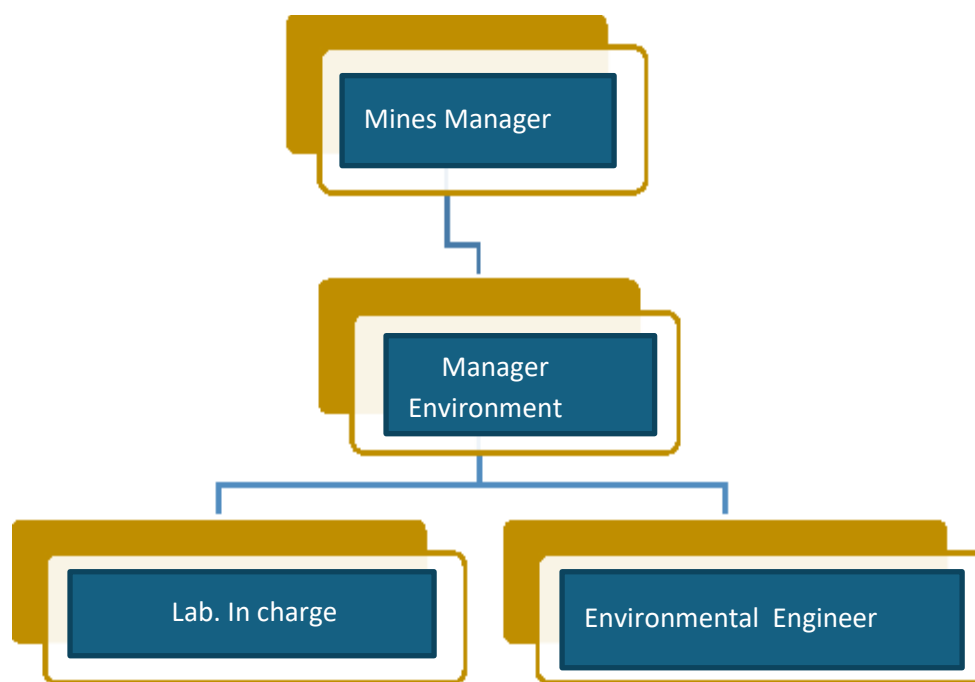


FIGURE 10-1 HIERARCHY OF ENVIRONMENTAL MANAGEMENT CELL (EMC)

10.2.1 Duties of EMC

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

10.3 LAND ENVIRONMENT MANAGEMENT

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

- Mineral will be mined out after leaving sufficient no mining zone of 1/10th of the total width of the river from both sides of the bank for bank stability.

- Mineral will be mined out after leaving 5-meter safety zone.
- In this activity, the work is proposed to be done manually as well as semi mechanically which will avoid adverse effects associated with heavy machinery and their functioning.
- Restoration of the bank will be ensured at the end of mine closure every year.
- The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.
- Operations during daylight only.
- No foreign material shall be allowed to remain/spill in lease area and catchment area, or no pits/pockets will be allowed to be filled with such material.
- Stockpiling of harvested sand and stone on the riverbed or riverbank shall be avoided.

Movement of the vehicles on the road will be increased; however, non-metalled road leading to mining area will be sprinkled with water at regular intervals. In addition to prevent spillage by trucks/tractor trolley, overloading should be controlled along with speed limit. There will be minimum numbers of access roads to the riverbed, as cutting riverbanks should be avoided and ramps are to be maintained. Access points to the riverbed are to be decided based on the following:-

- Least steepness of riverbank.
- Less damage to riverside vegetation and less human activity.
- Where steepness cannot be avoided access ramps should be constructed.
- Haulage roads parallel to the riverbank and roads connecting access (ramps) to the riverbed shall be away from the bank, preferably a minimum of 100m away.
- Access roads from the public roads and up to the riverbank should be aligned in such a way that it would cause least environmental damage.

There is no soil over mineralized area; however, the receding floods in the monsoon season deposit some clay/soil carried down by river water. Soil Quality will be monitored on a yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality.

Since mining lease area is a riverbed so plantation cannot be carried out in the lease area, however, plantation of suitable species like *Azadirachta indica*, *Delonix regia*, *Cassia fistula*, *Terminalia arjuna*, *Mangifera indica*, *Tectona grandis*, *Dalbergia sissoo*, *Tamarindus indica*, *Achras sapota*, *Zizyphus* species etc. will be planted after discussion with the Panchayat Pradhan, in demarcated and suggested area outside the HFL. It is suggested to carry out plantation for five years with suitable species from the date of operation.

10.3.1 Post mining land use

As the mining lease area is part of active river course and suffer floods every monsoon season, the land degradation impact due to the excavation of stone, boulders, bajri & sand undertaken

during dry period of the year will get replenished by fresh material and there shall not be any change in land use pattern in core zone i.e. mining lease area.

In view of the above, the mining lease area would remain active river course during and post mining operation.

10.4 WATER POLLUTION CONTROL MEASURES

10.4.1 Surface water

The major source of surface water pollution due to Sand, Stone and Bajri mining is insignificant, however the following measures shall be undertaken to prevent water pollution.

- The utmost care will be taken to minimize spillage of sand.
- Drains and their Catchments will be constructed just beside the access roads so that the storm water gets settled before flowing to the river/Nallah.
- The washing of trucks and tractor trolleys in the river will be avoided.
- Plantation will be done along the roadsides/Proponent's land and also at the crusher site after consultation with local villagers/authority.

10.4.2 Ground water

There would not be any adverse effect on the ground water quality. The mineral formation does not contain any harmful element, which could percolate into the ground and pollute the ground water. Hence, no control measures are required.

- However, regular monitoring of quality in the existing hand pumps/tube wells in the vicinity would be carried out both with reference to area and times intervals to study the hydrodynamics of the strata.

10.5 AIR POLLUTION CONTROL MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures would be adopted to mitigate the PM10 level in the ambient air. Dust particles generated during various mining activities when becoming airborne lead to an increase in PM10 level in the ambient air. The major source of dust generation is the transport of material by trucks and tractor trolleys. Adequate control measures shall be taken during mining operations as well as transportation of minerals.

The following steps shall be adopted to prevent air pollution due to airborne dust.

- Plantation will be done along the roadsides/Proponent's land and also at the crusher site after consultation with local villagers/authority.
 - Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
 - The only air pollution sources are the road transport network of trucks. Dust suppression measures like water spraying will be done on the roads.
-

- The utmost care will be taken to prevent spillage of sand from the trucks/tractor Trolley.
- Water sprinkling will be done to reduce the emission of dust due to transportation of minerals.
- Overloading will be prevented. The trucks/tractor trolley will be covered by tarpaulin covers.
- Plantation activities will help minimize the impact of dust on nearby villages.

10.6 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to mining and other association activities a detailed noise survey has been carried out, and results were cross referenced with standards and were found to be well within limits.

Blasting technique is not used for sand and stone lifting, hence there is no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noisy environment of the region. The only impact will be due to transportation of sand, stone and bajri by trucks and tractor trolleys.

As the only impact is due to transportation of stone to the stone crushing unit and sand to the market though village roads, the following control measures shall be taken to keep the ambient noise levels well within limits:-

- Minimum use of horns and speed limit of 10 kms in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn-out trucks.
- Provision of green belts in consultation with village panchayat along the road networks.
- Care will be taken to produce minimum sound during sand and stone loading.

10.7 BIOLOGICAL ENVIRONMENT

The mining activity will have insignificant effect on the existing flora and fauna. Data have been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre project biological environmental conditions. The mining of mineral from riverbed shall help in channelizing the water flow during monsoon and prevent damage to riverbanks. It was found that the sand and stone mining activity will not have any significant impact on the biological environment of the region.

10.7.1 Mitigation measures of impacts on biological environment

- ✓ It will be ensured that no mining activity will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.

- ✓ As the mining site has no vegetation, no clearance of vegetation will be done.
- ✓ Prior to closure of mining operations/during the rainy season the eroded bank will be restored/reclaimed to minimize negative impacts on aquatic habitats.
- ✓ Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
- ✓ Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
- ✓ Mining will be carried out daytime only. No night-time mining will be allowed, which may catch the attention of wild.
- ✓ No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
- ✓ Corridor for movement of wild mammals (If exists) will be avoided for mining/travelling purposes.
- ✓ Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive area to caution worker and other passer-by.

10.8 SOCIO-ECONOMIC ENVIRONMENT

This project operation will provide livelihood to the poorest section of society. The overall impact of riverbed mining of sand, stone and bajri on the social economics of the area shall be a very positive one, as not only it will generate employment opportunities for local population at mine site but also in associated activity i.e. at stone crushing plant, for transportation of mined material, etc. It will also give a good boost to the general economy of the area. About 15 persons shall be employed at the mine site and these people are to benefit directly or indirectly from the project.

10.8.1 Anticipated impacts and evaluation

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. A major portion of the houses in the study area are pucca type structures. The solid waste generated and Garbage bins for dry and wet waste will be provided in rest shelters. Biodegradable waste will be composted in compost pits. Other waste will be sent to crusher site from where it will be disposed to common disposal site of village. No waste will be disposed of the project site. The awareness level regarding the proposed mining activity is good.

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

10.9 OCCUPATIONAL HEALTH MANAGEMENT

There will be routine observation of health as certain sufferings are likely to appear as result of exposure by the workers during operations of various facilities. All the employees shall be required to undergo a medical checkup before joining the facility. Medical checkup will be conducted on regular basis, and the health conditions will be monitored. First aid facilities required to attend immediately for meeting emergency situations shall be made available at the facility.

10.10 ENVIRONMENTAL MONITORING PROGRAM

The following monitoring programme is proposed for the project to be undertaken on commencement of mining activity. The monitoring of the liked project, i.e. Stone Crusher, shall be carried out as per the norms of the State Pollution Control Board to meet the prescribed standards under EPA Act 1986.

10.10.1 Methodology of environmental management

The proponent shall follow the standard methods for half yearly monitoring various environmental parameters i.e., Air Water and Soil. The estimated cost of EMP is given in Table below:-

TABLE 10-1: ESTIMATED EXPENDITURE ON ENVIRONMENTAL MEASURES

Sr. No.	Title	Activities	Capital cost INR lakhs)	Recurring cost per year (INR lakhs)	Recurring cost for 5 yrs (INR lakhs)	Timeline of implementation
A. ENVIRONMENT MANAGEMENT PLAN (EMP)						

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

1	Pollution Monitoring (Testing of Air, Water, Soil, Noise)	1. Ambient Air 2. Water:-Surface & Ground 4. Soil 5. Noise	-----	1.0	5.0	Once in a six month (As per CPC B guideline)
2	Air Pollution Control- Haulage Roads, Mining Areas & surroundings	Management of dust emission on Haulage Roads and mine road (120 meters) through water Sprinkling using tractor trolley sprinkler. *Depreciation cost of water sprinkler.	3.0	0.81	4.0	Twice a day or as per requirement
3	Green Belt Development & Plantation	Land outside the HFL for Plantation. Area for Plantation=1.0 Ha. No. of plants =1200 Plants Plantation is proposed @* 1200 plants per Hect. *Cost is as per the *No.Ft.1790- /71(D)2011-12/Vol-VIII (Norms), Himachal Pradesh Forest Department, Shimla Dated 07 June 2019	1.54	0.73	3.63	During 1 st Year of mining
4	Occupational Health and Safety Measures	Provision of PPE, First Aid and other miscellaneous expenditure.	0.15	0.75	0.38	Once in year

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

5	Sanitation Facility and Domestic Water Management	Provision of one Toilet near Crusher Site	1.50	0.20	1.0	Prior to the start of mining
6	Additional Activity, if any	-----	-----	-----	-----	-----
Total EMP Cost			6.19	3.49	14.01	-----
B. Corporate Environment Responsibility (CER)						
7	The project proponent will spend 2% of the project cost under CER activities		-----	0.20	-----	-----
Total CER Cost			-----	0.20	-----	-----
Total (A+B)			6.19	3.69	14.01	-----

10.11 Conclusion

All possible environmental aspects have been adequately assessed, and necessary control measures have been formulated to meet statutory requirements. Thus, implementing this project will not have any appreciable negative impacts.

11 SUMMARY AND CONCLUSION

11.1 INTRODUCTION

The proposed Riverbed Mining for Extraction of Sand, Stone and Bajri is initiated by Sh. Raghav Thakur, Prop. M/s Aadhya Stone Crusher. The proposed project covers a lease area of 2.0569 Hectare. The proposed site is situated at Khasra Nos. . 2873, 28s80/1, 2881/1, and 2882, within Mauza/Mohal Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh.

As per the Ministry of Environment and Forests (MoEF), Government of India, Gazette Notification S.O. 1533(E) dated 14th September 2006 and its subsequent amendments, the proposed mining project for the extraction of Sand, Stone, and Bajri from the Swan River by Sh. Raghav Thakur, Prop. M/s Aadhya Stone Crusher falls under Category “B1” of activity 1(a)(i). Accordingly, the project requires prior Environmental Clearance from the State Environment Impact Assessment Authority (SEIAA), Himachal Pradesh.

The EIA study has been carried out based on standard Terms of Reference (TOR) issued vide TOR Identification no. TO25B0107HP5529278N dated 11.03.2026 by State Expert Appraisal Committee, Himachal Pradesh.

Shivalik Solid Waste Management Limited (SSWML), Zirakpur (Punjab), a NABET-accredited consultant (Certificate No. NABET/EIA/23-26/RA 0310, valid until August 17th, 2026), was entrusted with conducting the Environmental Impact Assessment (EIA) studies for the project.

The Environmental baseline monitoring period of the said project is from Jan- March’ 2026.

11.2 SALIENT FEATURES OF THE PROJECT

The proposed project is the riverbed mining for extraction of Sand, Stone & Bajri; the salient feature of the project is given in **Table 11-1 below**.

TABLE 11-1 SALIENT FEATURES OF THE PROJECT

Sr. No.	Parameters	Description
1	Project name	Riverbed mining project for the extraction of sand, stone, and bajri proposed by Sh. Raghav Thakur, Prop. M/s Aadhya Stone Crusher
2	Mining Lease Area	2.0569 Hectare

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

3	Location of mine	Khasra No. 2873, 2880/1, 2881/1, and 2882 in Mauza Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh.
4	Latitude	31° 40' 10.57" N to 31° 39' 56.98" N
5	Longitude	76° 4' 50.77" E to 76° 5' 4.61"E
6	Toposheet number	H43E2
7	Minerals of mine	Sand, Stone and Bajri
8	Proposed production of mine	67500 TPA (including Waste)
9	Method of mining	Semi Mechanized
10	Waste Generation	6750 TPA of mine waste in the form of Silty and Clay will be mined.
11	No of working days	270 days
12	Cost of the Project	10 Lakhs
13	Water demand	0.67 (Domestic) + 0.72 (Dust Suppression) =1.39 KLD
14	Sources of water	Water will be supplied from Tube well through tanker supplier located near project site.

11.3 BASELINE MONITORING STATUS

The Environmental Baseline data on air, water, soil, and noise levels for this EIA report was collected during the post-monsoon season (January to March 2026). This data was used to assess conditions for the proposed project. The ambient air quality was monitored within 10 km radius of the project. The detailed baseline is summarized as below:-

- The ambient air quality results obtained and found that all recorded values within the applicable limits of residential and rural area limits.
- Baseline noise levels results shows that the day equivalents and the night equivalents were within the Ambient Noise standards.
- Water samples in the study area were analyzed for physical and chemical characteristics. Overall, all the ground water samples collected from the study area were found to be fit for human consumption as per IS 10500 drinking water standards.
- There is no notified/protected ecologically sensitive area including forest, national park, sanctuary, Elephant/Tiger reserves existing in the study area.

11.4 LAND ENVIRONMENT

Degradation of land is not a very significant adverse impact of riverbed mining due creation of access roads, mining operations, transportation of mined material. In order to prevent the

environmental degradation of leased mine area and its surroundings, the following measures shall be taken:-

- As per the policy guidelines, no mining shall be allowed within 1/10th of the riverbanks or five meters whichever is higher.
- The boulders from the effective catchment are brought down in the river only during monsoons.
- To stop erosion 5 No of check dams and retaining structure will be constructed during mining activities in vulnerable location.
- With the replenishment of the pits and trenches during the floods, the process of controlled mining can continue year after year. The erosion and weathering of Shivalik boulders in catchments have inexhaustible supply of required minerals.
- Thus, no mining will be undertaken during the monsoon period. It will be undertaken only during dry seasons and dry part of the river.

Movement of the vehicles on the road will be increased; however, non metalled road leading to mine lease area will be sprinkled with water at regular intervals. In addition to prevent spillage by trucks/tractor trolley, overloading should be controlled along with speed limit.

There will be minimum numbers of access roads to the riverbed, as cutting riverbanks should be avoided and ramps are to be maintained. Access points to the riverbed are to be decided based on the following:-

- Least steepness of riverbank.
- Less damage to riverside vegetation and least human activity.
- Where steepness cannot be avoided access ramps should be constructed.
- Haulage roads parallel to the riverbank and roads connecting access (ramps) to the riverbed shall be away from the bank, preferably a minimum of 100m away.
- Access roads from the public roads and up to the riverbank should be aligned in such a way that it would cause least environmental damage.
- For particular operations approaching the riverbed from both the banks should be avoided.

11.4.1 Plantation and Soil Conservation

There is no soil over mineralized area; however, the receding floods in the monsoon season deposit some clay/soil carried down by river water. It is hardly a few millimeters thick and of not much consequence. Even in the areas of no mining activity the process of deposition in one season and transportation of previously deposited material in the next season takes place along with deposition of fresh material by receding floods.

Soil Quality will be monitored on a yearly basis in the area surrounding the core zone used for agricultural activity to check for any negative impacts on the soil quality. Plantation activities shall be undertaken outside the riverbed, in consultation with the village Panchayat,

on areas such as the proponent's own land (covering approximately 1.0 hectare). This initiative aims to improve land quality, enhance aesthetics, and reduce soil erosion.

11.4.2 Post Mining Land Use

As the mining lease area is part of active river course and suffer floods every monsoon season, the land degradation impact due to the excavation of sand, stone, boulder and bajri undertaken during dry period of the year will get replenished by fresh material and there shall not be any change in land use pattern in core zone i.e. mining lease area.

In view of the above, the mining lease area would remain active river course during and post mining operation.

11.5 WATER POLLUTION CONTROL MEASURES

11.5.1 Surface water

The major source of surface water pollution due to sand mining is insignificant, however the following measures shall be undertaken to prevent water pollution.

- The Utmost care will be taken to minimize spillage of stone and sand.
- Drains and their Catchments will be constructed just beside the access roads so that the storm water gels settle before flowing to the river.
- The washing of trucks and tractor trolleys in the river will be avoided.
- Plantation will be undertaken on the proponent's own land and along the roadsides, in consultation with local villagers and authorities.

11.5.2 Ground water

There would not be any adverse effect on the ground water quality. The mineral formation does not contain any harmful element, which could percolate into the ground and pollute the ground water. Hence, no control measures are required.

However, regular monitoring of quality in the existing hand pumps/tube wells in the vicinity would be carried out both with reference to area and times intervals to study the hydrodynamics of the strata.

11.6 AIR POLLUTION CONTROL MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the following measures would be adopted to mitigate the PM10 levels in ambient air.

Dust particles generated during various mining activities when becoming airborne lead to an increase in PM10 level in the ambient air. The major source of dust generation is the transportation of material by trucks and tractor trolleys. Adequate control measures shall be taken during mining operations as well as transportation of minerals.

The following steps shall be adopted to prevent air pollution due to airborne dust.

- Greenbelts shall be developed on the proponent's own land or along roadsides, preferably near the riverbank.
- Dust mask provided to the workers engaged at dust generation points like excavations, loading and unloading points.
- The only air pollution sources are the road transport network of trucks. Dust suppression measures like water spraying will be done on the roads.
- The utmost care will be taken to prevent spillage of sand from the trucks.
- Water sprinkling will be done to reduce the emission of dust due to transportation of mineral.
- Overloading will be prevented. The trucks/ tractor trolley will be covered by tarpaulin covers.
- Plantation activities in consultation with village Panchayat along the roads and proponent's own land will also reduce the impact of dust in the nearby villages.

11.7 NOISE POLLUTION CONTROL MEASURES

As there will be no heavy earth moving machinery there will not be any major impact on noise level due to sand, stone and bajri mining and other association activities a detailed noise survey has been carried out, and results were cross referenced with standards and were found to be well within limits.

Blasting technique is not used for lifting material, hence no possibility of land vibration. It was found that the proposed mining activity will not have any significant impact on the noise environment of the region. The only impact will be due to transportation of sand, stone and bajri by trucks and tractor trolleys.

As the only impact is due to transportation of stone to the crushing unit and sand & Bajri to the market though village roads, the following control measures shall be taken to keep the ambient noise levels well within limits:-

- Minimum use of horns and speed limit of 10 kms in the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn-out trucks.
- Provision of green belts in consultation with village Panchayat along the road networks.
- Care will be taken to produce minimum sound during sand and stone loading.

11.8 BIOLOGICAL ENVIRONMENT

The mining activity will have an insignificant effect on the existing flora and fauna. Data has been collected from various Government Departments such as forests, agriculture, fisheries, animal husbandry and various offices to establish the pre project biological environmental conditions. The mining of mineral from riverbed shall help in channelizing the water flow during monsoon and prevent damage to riverbanks. It was found that the sand and stone mining activity will not have any significant impact on the biological environment of the region.

11.8.1 Mitigation measures of impacts on biological environment

- ❖ As the mining site has no vegetation, no clearance of vegetation will be done.
- ❖ It will be ensured that no mining activity will be carried out during the monsoon season.
- ❖ Sprinkling will be done on the haul roads with water to avoid the dust emission, thus avoiding damage to the crops.
- ❖ Mining will be carried out daytime only.
- ❖ No discard of food, polythene waste etc. will be allowed in the lease area which would distract/attract the wildlife.
- ❖ No night-time mining will be allowed, which may catch the attention of wildlife.
- ❖ Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passer-by.

11.9 SOCIO-ECONOMIC ENVIRONMENT

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

11.9.1 Anticipated Impacts and Evaluation

The results of the field survey conducted based on a questionnaire prepared to understand the knowledge and perception of the people living around the project area, gives a clear idea about the need for the project. A major portion of the houses in the study area are pucca type structures. The awareness level regarding the proposed mining activity is good. The proposed mining activity is expected to provide stimulus to socio-economic activities in the region and thereby accelerate further development processes. However, there is an apprehension that local people may get engaged in illegal activities if the proposed mining operation or the project is shelved or there is inordinate delay in its execution.

11.10 BUDGETARY PROVISION FOR ENVIRONMENTAL MANAGEMENT PLAN (EMP)

To ensure effective implementation of environmental protection and safety measures, a comprehensive budgetary allocation has been made. This includes a capital investment of Rs. 6.19 lakhs, a recurring annual expenditure of Rs. 3.69 lakhs, and an additional recurring investment for five years of Rs. 14.01 lakhs over a period of five years to support sustained environmental management.

11.11 CORPORATE ENVIRONMENT RESPONSIBILITY

Corporate Environment Responsibility (CER) refers the responsibility of corporate or company or the proponent of any project towards environment and society. The project proponent will spend 2% of the project cost for CER activities.

12 DISCLOSURES OF CONSULTANTS

12.1 INTRODUCTION

M/s Shivalik Solid Waste Management Ltd. has been engaged as consultant by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher to conduct Environmental Impact Assessment study of the Proposed Riverbed mining project located at Khasra Numbers 2873, 2880/1, 2881/1 and 2882 in Mauza Ram Nagar, Tehsil Ghanari, District Una, Himachal Pradesh covering a lease area of 2.0569 Hectare. The brief about the consultant is given below in **Table 12-1**.

TABLE 12-1: BRIEF DETAILS OF CONSULTANT

Name of the Consultancy Company	M/s Shivalik Solid Waste Management Ltd.
Address	Registered Office: Village-Majra, P.O. Dabhota, Tehsil Nalagarh, Distt. Solan, Himachal Pradesh - 174101 Phone/Telefax: 01795-260427, 260227. Zirakpur Office: SCO 20-21, 1 st Floor, Near Hotel Dolphin, Baltana, Zirakpur Punjab- 140604 Phone/Telefax : 01762 – 509496
Website	www.sswml.com
Nature of Services	Treatment, Storage & Disposal Facility, EIA Consultancy , Environmental, Health & Safety Auditing, EMS, Environmental Monitoring & Laboratory Analytical Services, Wastewater Management, Energy Audit Greens Concept Development, etc.

SSWML is steadily advancing with progressive initiatives aimed at upholding global standards of excellence and enhancing the quality of outcomes across all its operations.

“At SSWML, we are deeply committed to preserving the balance of nature and delivering comprehensive solutions to environmental challenges. Our mission is to provide innovative and sustainable waste management services that uphold the highest standards of environmental care.”

Key Areas of Expertise at SSWML Include:-

- Treatment, Storage & Disposal Facility (TSDF) for hazardous waste
- E-waste recycling facility
- MoEF&CC and NABL-accredited environmental laboratory
- QCI-NABET accredited consultancy for Environmental Impact Assessment (EIA).

Shivalik Solid Waste Management Limited (SSWML), EIA Division is offering high quality technical services in the field of EIA, Environment, Health & Safety (EHS), and Environmental Monitoring & Laboratory Analytical Services etc.

SSWML is supported by distinguished professionals, engineers & scientists who have excellent experience in executing EIA and other environmental projects.

SSWML is equipped to provide EIA consultancy in the following sectors:

- Mining of minerals 1(a)
- River Valley, Hydel, Drainage and Irrigation projects 1 (c)
- Cement plants 3 (b)
- Pesticides industry and pesticide specific intermediates 5 (b)
- Common hazardous waste treatment, storage, and disposal facilities (TSDFs) 7 (d)
- Biomedical Waste Treatment Facilities 7(da)
- Common Municipal Solid Waste Management Facility 7 (i)
- Building and large construction projects including shopping malls, multiplexes, commercial complexes, housing estates, hospitals, institutions 8 (a)
- Townships and Area development projects 8(b)
- Metallurgical Industries (ferrous & non-ferrous)- both primary & secondary 3 (a)
- Synthetic organic chemicals industry 5 (f)
- Industrial estates/ parks/ complexes/areas, export processing Zones (EPZs), Special Economic Zones(SEZs), Biotech Parks, Leather Complexes 7 (c)
- Common Effluent Treatment Plants (CETPs) 7(h)

Various other services being offered under Environmental Consultancy are:

- Social Impact Assessment
- Impact Assessment Report
- Ecology and biodiversity Studies
- Preparation of Mining Plan
- Environment Management Plan
- Environment Due Diligence
- Resettlement & Rehabilitation Action Plan
- Risk Assessment
- Green Audit/Environmental Audit/Energy Audit
- Detail Project Reports (DPR) / Pre-Feasibility Report (PFR)

Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher

- Compliance to the conditions of Environment Clearance
- Designing, Engineering, Supplying, Erection & Commissioning of Water and Wastewater Treatment Plant's i.e. STP's, ETP's, R. O's, Evaporator, MEE, APCD, CETP's, TSDF etc.
- Design and detailing of Rainwater Harvesting Structure's
- Providing Consultancy services related to Energy and Environment Activities

Environmental Monitoring & Laboratory Analytical Service:

SSWML has MoEF&CC and NABL approved Laboratory for conducting the Environment monitoring & Analysis of Stack Emissions, Ambient Air, Noise, Water & Wastewater, Soil, Solid Wastes & Hazardous Wastes etc.

SSWML has strong client base which includes Industrial, Government, Public & Private sector reputed clients @ PAN India.

12.2 RECOGNITIONS

We are a QCI-NABET accredited EIA Consultant organization, MoEF&CC recognized Environment Consultant, MoEF&CC recognized Laboratory, NABL accredited Laboratory as per ISO/IEC 17025:2017, ISO 9001:2015, ISO 14001:2015, OHSAS 45001: 2018 Certified as well as 5 "S" Certified Organization.



Draft EIA Report for Mining of Sand, Stone & Bajri from Swan River Proposed by Sh. Raghav Thakur Prop. M/s Aadhya Stone Crusher




Certificate of Registration

OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEM - ISO 45001:2018

This is to certify that: **Shivalik Solid Waste Management Limited**
 Village: Majra
 P.O.: Dabhota
 Teh.: Nalagarh
 Dist. Solan 174 101
 Himachal Pradesh
 India

Holds Certificate No: **OHS 589719**
 and operates an Occupational Health and Safety Management System which complies with the requirements of ISO 45001:2018 for the following scope:

I. Collection, Treatment, Storage and Disposal of Hazardous Waste; and
 II. Providing Environmental Related Analytical and Monitoring Services and Environmental Consultancy.

[Previously certified to BS OHSAS 18001:2007 since 05-09-2012]

For and on behalf of BSI: 
 Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2018-06-29 Effective Date: 2021-08-20
 Latest Revision Date: 2021-07-05 Expiry Date: 2024-08-19

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Certificate of Registration

QUALITY MANAGEMENT SYSTEM - ISO 9001:2015

This is to certify that: **Shivalik Solid Waste Management Limited**
 Village: Majra
 P.O.: Dabhota
 Teh.: Nalagarh
 Dist. Solan 174 101
 Himachal Pradesh
 India

Holds Certificate No: **FS 589717**
 and operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the following scope:

I. Collection, Treatment, Storage and Disposal of Hazardous Waste; and
 II. Providing Environmental Related Analytical and Monitoring Services and Environmental Consultancy.

For and on behalf of BSI: 
 Chris Cheung, Head of Compliance & Risk - Asia Pacific

Original Registration Date: 2012-09-05 Effective Date: 2021-08-20
 Latest Revision Date: 2021-07-05 Expiry Date: 2024-08-19

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Confederation of Indian Industry

Membership Certificate

This is to certify that

Shivalik Solid Waste Management Ltd

is an Annual Member of Indian Green Building Council (IGBC)

Bearing Membership No IGBCCS232298

This certificate shall be valid up to December 2026


K S Venkatagiri
 Executive Director
 CII - IGBC


B Thiagarajan
 Chairman
 Indian Green Building Council


C Shekar Reddy
 Vice Chairman
 Indian Green Building Council

Indian Green Building Council
 CII - Sohrabji Godrej Green Business Centre, Survey No. 54, Near Hitech City, R R Dist, Hyderabad - 500 084
 T: +91 40 4418 5132 / 33 F: +91 40 4418 5189 E: igbc@cii.in W: igbc.in

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National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

SHIVALIK SOLID WASTE MANAGEMENT LIMITED

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

VILLAGE-MAJRA, P.O. -DABHOTA, SOLAN, HIMACHAL PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-12094
 Issue Date: 11/08/2025 Valid Until: 10/08/2029

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL. (To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: SHIVALIK SOLID WASTE MANAGEMENT LIMITED

Signed for and on behalf of NABL



Anuja Amand Director
 Chakravarthy T. Kannan Chief Executive Officer



National Accreditation Board for Education and Training

Certificate of Accreditation

Shivalik Solid Waste Management Limited, Zirakpur

SCO 20-21, 1st Floor, Near Hotel Dolphin, Dhakoli, Zirakpur - 140604, Punjab

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

S.No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including open cast and underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	A
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Cement plants	9	3 (b)	B
5.	Pesticides industry and pesticide specific intermediates	17	5 (b)	A
6.	Synthetic organic chemicals industry	21	5 (f)	B
7.	Industrial estates/ parks/ complexes/ Areas, export processing zones (EPZs), Special economic zones (SEZs), Biotech parks, Leather complexes	31	7 (c)	B
8.	Common hazardous waste treatment, storage and disposal facilities (TSDFs)	32	7 (d)	A
9.	Bio-medical waste treatment facilities	32A	7 (d a)	B
10.	Common Effluent Treatment Plants (CETPs)	36	7 (h)	B
11.	Common Municipal Solid Waste Management Facility (CMSWMF)	37	7 (i)	B
12.	Building and construction projects	38	8 (a)	B
13.	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in RAAC minutes dated October 27, 2023 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no QCI/NABET/ENW/ACC/23/3065 dated Dec. 13, 2023. The accreditation needs to be renewed before the expiry date by Shivalik Solid Waste Management Limited, Solan following due process of assessment.

Issue Date: December 13, 2023 Valid up to: August 17, 2026



Mr. Ajay Kumar Jha Sr. Director, NABET
 Certificate No. NABET/EIA/23-26/RA 0310
 Prof (Dr) Varinder S Kanwar CEO- NABET

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

FIGURE 12-1: ACCREDITATION CERTIFICATES

