GMVN
GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

E-Mail: gmvnl@gmvnl.com
gmvn@sancharnet.in
Ph :- 0135-2746817,2749308
Fax :- 2746847

Ref---61-IMining---

Date --21/04/16-------

To,

The Director (IA-II),
Ministry of Environment, Forest & Climate Change,
Indira Paryavaran Bhawan,
Lodhi Road, Jor Bagh,
New Delhi-110003

Sub: Reply submission regarding Environmental Clearance of the proposed River Aasan Lot No. 14/6 Sand, Bajri & Boulder Mining Project (2.5 Lakh TPA) located at Village: Sabhawala, Indripur, Lakshmipur & Sahaspur Tehsil: Vikasnagar & District: Dehradun, Uttarakhand (32.709 Ha) under M/s Garhwal Mandal Vikas Nigam Ltd. Uttarakhand.

Ref: Summary record of **37th Meeting** of the Reconstituted Expert Appraisal Committee for Environmental Appraisal of Mining Projects (Non-Coal) of the Ministry of Environment, Forest and Climate Change, held during **August 25th -27th, 2015**

Dear Sir,

With reference to the above mentioned subject, we herewith submit revised EIA report of said project with prescribed format and requisite documents and reports as per the queries raised in the 37th Meeting of the Reconstituted Expert Appraisal Committee for Environmental Appraisal of Mining Projects (Non-Coal) of the Ministry of Environment, Forest and Climate Change was held during August 25th-27th, 2015.

Now as per latest notification {S.O. 141(E)} issued on 15th January, 2016 by MoEF&CC, the said project comes under Category A (*Cluster situation: Cluster mine leases area <50 hectares*). Map showing cluster situation has attached herewith.

I humbly request you to kindly consider the case for the Environmental Clearance.

Thanking You

Yours truly

Managing Director
(GMVN Ltd.)

Enclosure as above

By Speed Post

No. J-11015/90/2013-IA.II (M)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division
***

Indira Paryavaran Bhavan,
Vayu Wing, 3rd Floor, Aliganj,
Jor Bagh Road, New Delhi-110 003

Dated: 23rd September, 2015

To,

M/s Garhwal Mandal Vikas Nigam Ltd.
74/1, Rajpura Road,
Dehradun,
Uttarakhand-248001

Ph.: 0135-2746817, 2749308; Fax: 0135-2746847.
Email: gmvn@gmvnl.com, gmvn@sancharnet.in

Sub.: Mining of Mineral Sand, Bajri and Boulder (Minor Mineral) River Aasan Lot No. 14/6 with proposed production capacity of 2,50,000 TPA (ROM) by M/s Garhwal Mandal Vikas Nigam (GMVN) Limited, located at village-Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil-Vikasnagar, District-Dehradun, Uttarakhand (MLA 32.709 ha) - Information/ Clarification regarding.

Sir,

This has reference to your above mentioned proposal for Environmental Clearance. The Proposal of EC was appraised by the Reconstituted Expert Appraisal Committee in its 37th meeting held during **August 25-27, 2015** wherein the Committee **deferred** the proposal and noted that the **Consultant has not prepared the EIA/EMP Report in-line with the Annexure-III of EIA Notification, 2006. There are several deficiencies** viz. (i) Disaster management plan is not adequate and needs to be revised; (ii) Action Plan along with budgetary provisions on the issues raised during Public Hearing are not prepared adequately; (iii) There is no proper page numbers and index mentioned in the EIA/EMP Report; (iv) The EIA/EMP report along with Annexures are not legible; (v) Certified location map and distance certificate from the State Government with respect to protected areas has not been submitted; (vi) NOC from Sarpanch has not mentioned the capacity of water; (vii) List of flora/fauna and endangered species are not accurate; Plant species w.r.t. river bed are not explored; (viii) Green belt species proposed are not adequate. PP needs to resubmit the revised name of species; (ix) TOR compliance no. 44 w.r.t. impact on mining on plankton was not addressed properly; (x) PP has not done the replenishment study. PP informed that they had requested IIT Roorkee, vide letter dated 19.04.2015 for replenishment study. The Committee is of the view that Ministry issued TOR in 2013 and PP had given the replenishment study work to IITR only in April 2015. PP needs to conduct the replenishment study for appraising before the EAC; and (xi) The Committee noted that Mine Plan has been approved by Department of Mining & Geology, Uttarakhand vide letter dated 03.03.2015 and the Public Hearing was held on 16.07.2014 i.e. prior to approval of the Mine Plan. Thus the Public was informed about the Mining Proposal with a draft Mine Plan only. In view of the above, it was decided by the Committee that the comments of the Mining & Geology Department be secured

on material changes, if any, in the Final Mine Plan compared to the said Draft Mining Plan submitted by the Proponent to the Public.

2. Keeping these in view, you are requested **to revise the EIA/EMP Report which also includes the above said information and submit online to the Ministry of Environment, Forest and Climate Change**, Indira Paryavaran Bhawan, 3rd Floor, Vayu Wing, Aliganj, Jor Bagh Road, New Delhi-110003 for further necessary action on the matter.

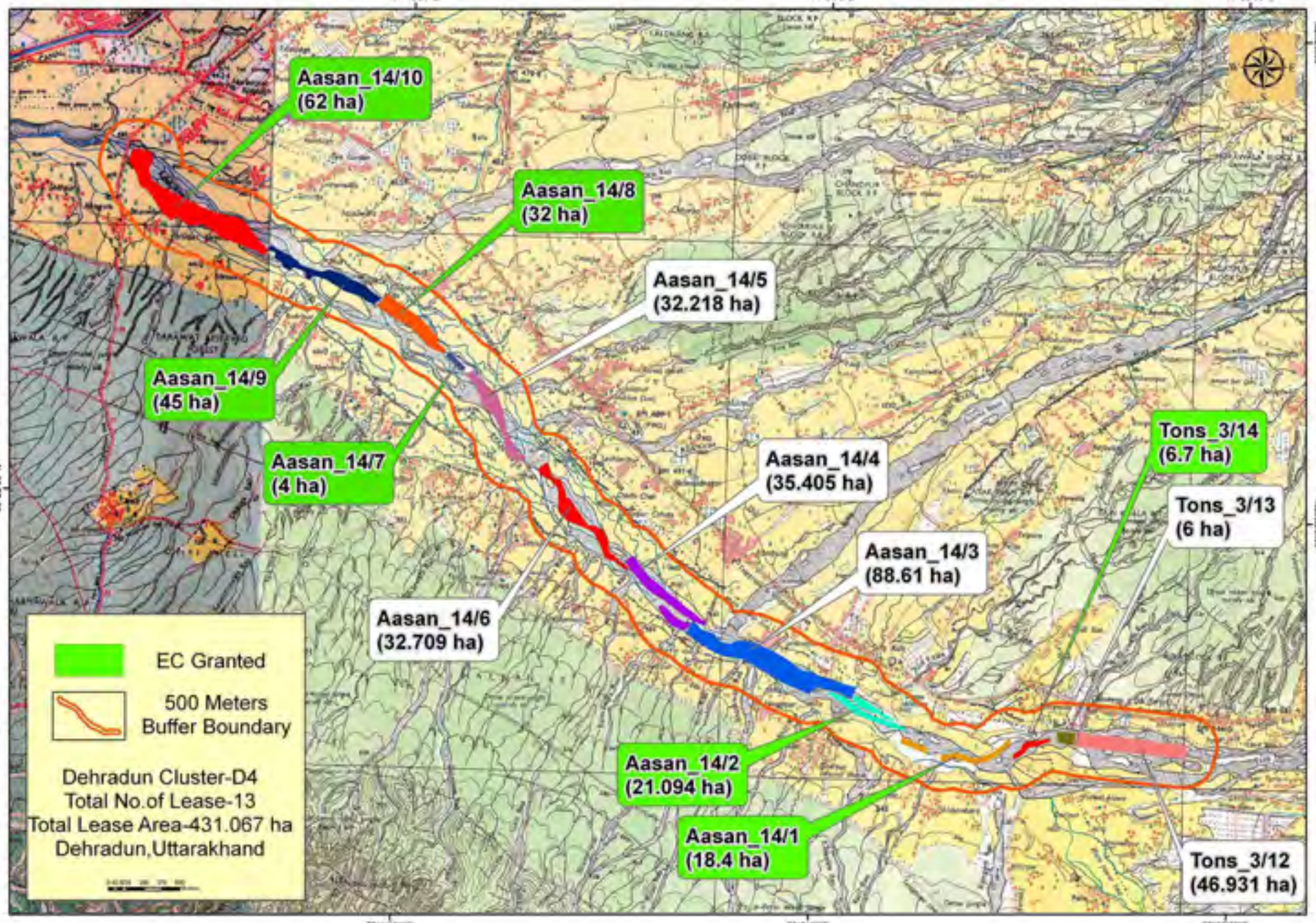
Yours faithfully,

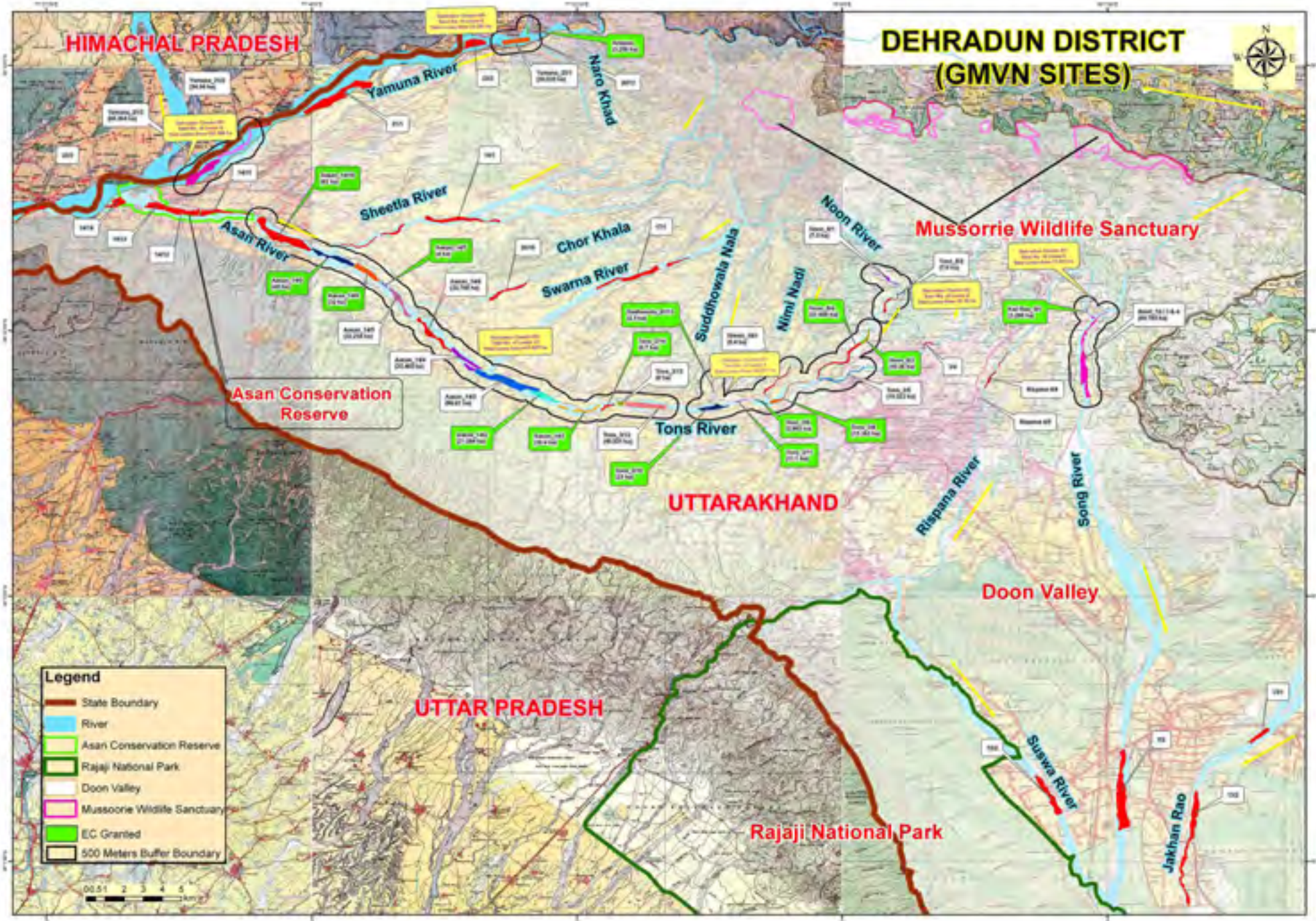
(Dr. U. Sridharan)
Director(S)

Copy to:-

The Additional Principal Chief Conservator of Forests (C), Ministry of Environment, Forest and Climate Change, Regional Office (NCZ), Pearson Road, P.O. New Forest, Forest Research Institute (FRI) Campus, Dehradun – 248006.

(Dr. U. Sridharan)
Director(S)


Aasan_14/10
(62 ha)
Aasan_14/8
(32 ha)
Aasan_14/5
(32.218 ha)
Aasan_14/9
(45 ha)
Aasan_14/7
(4 ha)
Aasan_14/4
(35.405 ha)
Tons_3/14
(6.7 ha)
Tons_3/13
(6 ha)
Aasan_14/3
(88.61 ha)
Aasan_14/6
(32.709 ha)
Aasan_14/2
(21.094 ha)
Aasan_14/1
(18.4 ha)
Tons_3/12
(46.931 ha)
EC Granted
500 Meters
Buffer Boundary
Dehradun Cluster-D4
Total No.of Lease-13
Total Lease Area-431.067 ha
Dehradun,Uttarakhand


DEHRADUN DISTRICT
(GMVN SITES)
HIMACHAL PRADESH
UTTARAKHAND
UTTAR PRADESH
Yamuna River
Naro Khad
Sheetla River
Asan River
Chor Khala
Swarna River
Suddhowala Nala
Nimi Nadi
Noon River
Tons River
Rispana River
Song River
Suswa River
Jakhan Rao
Asan Conservation Reserve
Mussorrie Wildlife Sanctuary
Doon Valley
Rajaji National Park
Legend
State Boundary
River
Asan Conservation Reserve
Rajaji National Park
Doon Valley
Mussoorie Wildlife Sanctuary
EC Granted
500 Meters Buffer Boundary
0 0.5 1 2 3 4 5 km

FINAL

ENVIRONMENTAL IMPACT ASSESSMENT

AND

ENVIRONMENTAL MANAGEMENT PLAN REPORT

OF

RIVER AASAN LOT NO. 14/6 SAND, *BAJRI* & BOULDER MINING PROJECT

Village: Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil: Vikasnagar,

District: Dehradun, State: Uttarakhand

(Area: 32.709 Ha, Proposed Capacity: 2.5 Lakh TPA)

APPLICANT

GARHWAL MANDAL VIKAS NIGAM LTD.

74/1 RAJPUR ROAD, DEHRADUN

Prepared By

GRASS ROOTS RESEARCH & CREATION INDIA (P) LTD.

(An ISO 9001:2008 Certified Co.: Accredited by QCI / NABET: Approved by MoEF, GoI)

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GRC INDIA TRAINING & ANALYTICAL LABORATORY
(Accredited by NABL &Recognized by MoEF, GoI)
A unit of GRC India

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ABBREVIATIONS

AMSL	Above Mean Sea Level
AAQ	Ambient Air Quality
bgl	Below Ground Level
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CSR	Corporate Social Responsibility
dB	Decibel
DO	Dissolved Oxygen
EAC	Expert Appraisal Committee
EIA	Environmental Impact Assessment
EMC	Environmental Management Cell
EMP	Environment Management Plan
EPA	The Environment Protection Act
GLC	Ground Level Concentration
Ha	Hectare
HFL	High Flood Level
JIR	Joint Inspection Report
KLD	Kilo litre Per Day
Km	Kilo Meter
Leq	Equivalent Noise Level
LFL	Low Flood Level
LOS	Level of Service
LoI	Letter of Intent
MoEF	Ministry of Environment and Forest
NABET	National Accreditation Board for Education and Training
NH	National Highway
NOC	No Objection Certificate
OSHA	Occupational Safety and Health Administration
PCU	Passenger Car Unit
PFR	Pre- feasibility Report
PM	Particulate Matter
PUC	Pollution Under Control
QCI	Quality Council of India
RBM	River Bed Material
RL	Reduced Level
SH	State Highway
SPCB	State Pollution Control Board
ToR	Terms of Reference
TPA	Tonnes Per Annum
USEPA	United State Environmental Protection Agency

By Speed Post

No. J-11015/90/2013-IA.II (M)
Government of India
Ministry of Environment & Forests

Paryavaran Bhavan,
C.G.O. Complex, Lodi Road,
New Delhi-110 003
Dated the 23rd July, 2013

Jan 13/45

To

M/s Garhwal Mandal Vikas Nigam ltd.
74/1, Rajpur Road
Dehradun,
Uttarakhand

Subject: Collection of Sand, Bajri and Boulders in River Aasan of M/s Garhwal Mandal Vikas Nigam Ltd. Located at Vill-Sahaspur, Tehsil-Vikas Nagar, Distt-Dehradun, Uttarakhand (32.7090 ha, 2.5 Lakh TPA)– TOR regarding.

The Proposal was received in the Ministry on 12.03.2013. The Proposal is to determine the Terms of Reference for which the proponent had submitted information in the prescribed format (Form-1) along with Pre-feasibility report.

2. The Mine Lease area is located at Village: Sabhawala, Indripur, Lakshmipur, Sahaspur, Tehsil: Vikas Nagar District: Dehradun,State: Uttarakhand. The lease area lies on River Asan. The Mine Lease area is between: Latitude: 30°22'55.45"N to 30°22'3.32"N Longitude: 77°47'57.12"E to 77°48'58.89"E. The Project is located in seismic zone-IV. It is 'A' category project as due to the presence of Inter-state Boundary of Uttarakhand-Uttar Pradesh (About 8 km in SW Direction), Doon Valley (Project site is in Doon valley) & Asan Wetland Conservation Reserve (About 9 km in NW Direction) within 10 Km radius of the lease area. NBWL clearance is mandatory for the project. The proposed project is an open-cast mining project, confined to extraction of sand, bajri and boulder from the proposed site. The operation will be manual with use of hand tools like shovel, pan, sieves, etc. Sand will be separated from bajri and boulders by sieving process. Excavation will be carried out up to a maximum depth of 1.5 meter. Total material handling in a year would be 2.5 Lakh TPA and the total reserve is calculated as 7 lakh tonnes. Extraction of sand, bajri and boulder material will be done only during the day time and completely stopped during the monsoon season. State Government has issued Letter of Intent No. 589/Bhu. Khani.E./2012-13 dated 23.01.2013. Total water requirement will be 4.5 KLD. This water will be supplied from the bore well from nearby villages through tankers as well as from surface water sources for dust suppression with proper permission. Additional water will also be required for plantation purpose. Silt/Clay (6-12% of sand excavated) will be generated as waste, to be disposed off as filling in low-lying area, for plantation & as spreading in agricultural fields. It is reported by the project proponent that there is no court case/litigation is

pending against the project. The total cost of project would be around Rs. 16,30,000 which includes Rs. 3,00,000 for EMP implementation.

3. The proposal was placed before Expert Appraisal Committee in its meeting held during May 15th -17th, 2013, the Committee prescribed the following TORs for undertaking detailed EIA study:

1. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification, 1994 came into force w.r.t. the highest production achieved prior to 1994.
2. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
3. All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of the lessee.
4. All corner coordinates of the mine lease area, superimposed on a High Resolution Imagery/toposheet should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
5. Does the company have 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.
6. 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.
7. 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.
8. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.
9. 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.

10. 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.
11. 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.
12. 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.
13. The vegetation in the RF / PF areas in the study area, with necessary details, should be given.
14. 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.
15. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, 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 State Wildlife Department/Chief Wildlife Warden under the Wildlife (Protection) Act, 1972 and copy furnished.
16. 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, 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 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.
17. 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 Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.
18. 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).

19. 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 located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.
20. One season (non-monsoon) primary baseline data on ambient air quality (PM10, SO2 and NOx), 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.
21. Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.
22. 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.
23. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.
24. 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.
25. 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.
26. 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. 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.

27. 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.
28. 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.
29. 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.
30. 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.
31. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.
32. 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.
33. 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.
34. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.
35. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.
36. Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.
37. Detailed environmental management plan to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.
38. Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to implement the same

should be provided and also incorporated in the final EIA/EMP Report of the Project.

39. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be given.
40. The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.
41. Details of sand replenishment studies.
42. Details of Transportation of mined materials as per the Indian Road Congress for both the ways with loaded as well as unloaded traffic load and its impact on Environment.
43. Study on cumulative impact due to sand mining shall be carried out.
44. Study of impact of mining on plankton.
45. Cluster approach to be followed for collection of baseline data.
46. Appropriate Disaster Management safeguards in view of the high seismicity of the area and
47. Clearance under the Wildlife (Protection) Act, 1972 from the Standing Committee of National Board for Wildlife shall be obtained.

4. 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) Where the documents provided are in a language other than English, an English translation should be provided.
d) The Questionnaire for environmental appraisal of industrial projects as devised earlier by the Ministry shall also be filled and submitted.
e) 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 also be followed.
f) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the F.R for securing the TOR) should be brought to the attention of MoEF 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.
g) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, you are requested to submit certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forests, if applicable.

5. 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.

6. After preparing the draft EIA (as per the generic structure prescribed in Appendix-III of the EIA Notification, 2006) covering the above mentioned

issues, the proponent will get the public hearing conducted and take further necessary action for obtaining environmental clearance in accordance with the procedure prescribed under the EIA Notification, 2006.

(Dr. Saroj)
Director

Copy to:

(i) The Secretary, Ministry of Mines, Government of India, Shastri Bhawan, New Delhi

(ii) The Secretary, Department of Mines & Geology, Government of Uttarakhand, Secretariat, Dehradun.

(iii) The Secretary, Department of Environment, Government of Uttarakhand, Secretariat, Dehradun.

(iv) Chief Wildlife Warden, Government of Uttarakhand, Secretariat, Dehradun.

(v) Secretary, SCMC, Dehradun.

(vi) The Chief Conservator of Forests, Central Region, Ministry of Environment and Forests, B-1/72, Sector-A, Aliganj, Lucknow-226020.

(vii) The Chairman, Central Pollution Control Board, Parivesh Bhavan, CBD-cum-Office complex, East Arjun Nagar, New Delhi-1100032.

(viii) The Member Secretary, Central Ground Water Authority, A-2, W3, Curzon Road Barracks, K.G. Marg, New Delhi-110001.

(ix) The Chairman, Uttarakhand Environment Protection & Pollution Control Board, E-115, Nehru Colony, Hardwar Road, Dehradun, Uttarakhand.

(x) The Controller General, Indian Bureau of Mines, Indira Bhavan, Civil Lines, Nagpur-440 001.

(xi) The District Collector, Dehradun District, Uttarakhand.

(xiv) Guard File.

(Dr. Saroj)
Director

CHAPTER-I

INTRODUCTION

INDEX

1.0 PURPOSE OF THE REPORT

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

The present Environmental Impact Assessment report is prepared to comply with the Terms of Reference (TOR) received from EAC MoEF, GOI under EIA notification of the MoEF dated 14th September, 2006 as amended and also the EIA Guidance Manual for Mining of Minerals (Feb, 2010) of MoEF, Govt. of India, for seeking environmental clearance for mining of sand in the applied mining lease area.

1.1 IDENTIFICATION OF PROJECT & PROJECT PROPONENT

The project is being proposed by Garhwal Mandal Vikas Nigam (GMVN) Limited.

The address of the proponent is given below:

Garhwal Mandal Vikas Nigam Limited,
74/1 Rajpur Road, Dehradun
Uttarakhand
Ph: - 0135-2746817, 2749308
gmvnl@gmvnl.com

The proponent has applied for mining lease in the name of River Aasan Lot No. 14/6 Sand, Bajri & Boulder Mining Project over an area of 32.709 ha

near Village: Sabhawala, Indripur, Lakshmipur & Sahaspur Tehsil: Vikasnagar & District: Dehradun, Uttarakhand. The Environmental clearance has been applied for the allotted lease area, decided as per the Letter of Intent vide Letter No. 589/Bhu. Khani.E./2012-13 dated 23-1-2013 issued by Geology & Mining Unit, Directorate of Industries, Govt. of Uttarakhand. The LOI is attached as **Annexure I (a).**

1.2 BRIEF DESCRIPTION OF PROJECT

The proposed project is to mine Sand, Bajri & Boulder from bed of Aasan River, over an area of 32.709 ha near Village: Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil: Vikasnagar & District: Dehradun, Uttarakhand.

It has been proposed to mine around 2.5 lakh Tonnes per annum of minerals. The estimated project cost for the proposed project is Rs.16.30 Lakhs.

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **category 'A'** project as Interstate Boundary of Uttarakhand & Uttar Pradesh and Aasan Conservation lies within the 10 km radius of the lease area and the lease area also lies in Doon Valley which is an eco-sensitive area.

The proposed mining lease area falls in Survey of India Toposheet 53F15 (Site). The mine lease co-ordinates and connectivity details are listed below:

Latitude	30°22'55.45"N to 30°22'3.32"N
Longitude	77°47'57.12"E to 77°48'58.89"E

Connectivity Details given below:

Connectivity Details		Aerial Distance
Nearest Railway Station	Dehradun Railway Station in SE direction	About 21 km
Nearest Airport	Jolly Grant Airport in SE direction	About 40 km
Nearest Highway	NH-72 in NE direction.	About 1.5 km

Project's importance to the country and the region

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

Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer by the way of royalty.

This project operation will provide direct and indirect employment to the people residing in nearby villages improving their social/economical status.

1.3 SCOPE OF THE STUDY

The project proposal was submitted to Ministry of Environment and Forests for its appraisal. Based on which, presentation for Terms of Reference (TOR) was held on 15th May, 2013. Based on the data provided and presentation done, the Ministry of Environment and Forests, Uttarakhand has issued the Terms of Reference vide letter No. J-11015/90/2013-IA.II(M) dated 23rd July' 2013.

The points given by the MoEF in the TOR has been considered and their compliances are as under:-

Point Wise Compliance for TOR

S.No.	Tor	Compliance
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.	No mining activity has been carried out prior to 1994. Hence no production has been done.
2.	A copy of the document in support of the fact that the proponent is the rightful lessee of the mine should be given.	A copy of LOI in support of the fact that the proponent will be the rightful lessee of the mine is attached as **Annexure I (a)**
3.	All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management and mining technology and should be in the name of lessee.	Approved Mine Plan compatible with the EIA/EMP report **in terms** of the mine lease area, production levels, waste generation and its management and mining technology. The approved Mine Plan is attached as **Annexure XIII**.
4.	All corner coordinates of the mine lease area superimposed on High Resolution Imagery/topo sheet should be provided. Such an imagery of the proposed area should clearly show the landuse and other ecological features of the study area (core and buffer zone).	Corner coordinates of the mine lease area superimposed on high resolution toposheet has been incorporated in Chapter II (pg no. 25).
5.	Does the company have a well laid down Environment Policy	The project is being proposed by Garhwal Mandal Vikas Nigam,

	approved by its Board of Directors? If so, it may be detailed 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 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.	Government of Uttarakhand Enterprise. Hence the policy i.e. Uttarakhand Mining Policy, 2011 will be followed. The Environmental Management Cell (EMC) has been formulated to deal with environmental issues and to ensure compliance with EC conditions. The EMC will be made in charge for reporting non compliances to the Owner.
6.	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.	Mines safety for workers working at the site has been taken care of. Safety measures related to risks during mining activity, natural disasters, etc has been proposed Details about the same are given in Chapter VI (pg no. 111). The proposed project is a river bed mining project. It is not an underground mining project and therefore no subsidence and blasting study is proposed.
7.	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	The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is given as Map No. 1 in Chapter II. All the details in the

	should be for the life of the mine / lease period.	EIA report are for the life of the lease period. The details of mining & production has been given in Chapter II (pg no. 32).
8.	Land use of the study area should be described delineating forest area, agricultural land, grazing land, wildlife sanctuary and national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if, any, of change of land use should be given.	Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated as Map No.3, Chapter III. There are no National Park or Wildlife Sanctuary or Migratory routes of fauna within the 10 km radius of study area. Aasan Conservation reserve lies within the 10 km radius of study area As the lease area lies in the river bed there will be no change in the land use plan of the mine lease area in preoperational, operational and post operational phases. Only the sediments will be removed from the surface.
9.	Details of the land for any Over Burden Dumps outside the mine lease, such extent of land area, distance from mine area, its land use R&R issues, if any, should be given.	The proposed project is a River Bed Mining Project, therefore there will be no Over Burden & hence no dumps are proposed in the lease area.
10.	A certificate from 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	There is no forest land within the lease area. Inspection report confirming the same with report from forest department has been attached as **Annexure I(b)**

	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.	
11.	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 a forestation (CA) should be indicated. A copy of the forestry clearance should be furnished.	No forest land is involved in the lease area, therefore, deposition of net present value (NPV) and compensated Afforestation is not indicated. Report from forest department has been attached as **Annexure I (b)**
12.	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.	There is no involvement of forest land in the project area.
13.	The vegetation in the RF / PF in the study area, with necessary details, should be given.	There around 10 RF in the study area are detailed in Chapter III The vegetation details of the same are incorporated in Chapter III (pg no. 62) of the report.
14.	A study shall be got done to ascertain the impact of the Mining Project on the wildlife in the surrounding and any other protected area and accordingly detailed mitigative measures required, should be worked out	There is Aasan Conservation Reserve within the 10 km radius study area, which is a habitat for various migratory birds (mentioned in Chapter III) and the lease also lies within the Doon Valley, which is an eco-sensitive area.

	with cost implications and submitted.	There is no schedule-I species found in the study area. Details of impacts & mitigation measures are given in Chapter IV (pg no. 87) of report.
15.	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, 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 State Wildlife Department/Chief Wildlife Warden under Wildlife (Protection) Act, 1972 and copy furnished.	There are no National Parks and Sanctuaries within 10 km of the mine lease area. However, Aasan Conservation Reserve lies within the study area. Buffer Map showing the location of the reserve is attached as Map No 1 in Chapter The lease area also lies in the Doon Valley, which is an eco-sensitive area.
16.	A detailed biological study for 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, duly authenticated, separately for core and buffer zones should be furnished based on 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 for their conservation should be	Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease has been carried out for the project. The same has been incorporated in Chapter III (pg no. 58-76) of the report. No schedule I fauna found within core & buffer zone. List of Flora & Fauna of the study area has been submitted to Chief Wildlife Warden of Dehradun on 14.10.14 (letter attached as

	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.	**Annexure-VII**)
17.	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 Dept. should be secured and furnished to the effect that the proposed mining activities could be considered-	There is no area declared as 'Critically Polluted and also no area of the project come under the 'Aravali Range' within 10 km radius of the project site.
18.	Similarly, for coastal Projects, A CRZ map duly authenticated by one of 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).	The proposed project is not a coastal project. Hence no approval of the concerned Coastal Zone Management Authority is required.
19.	R & R compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement	There are no inhabited areas in the allotted mine area which lies on the river bed, therefore no R&R Plan is proposed. However compensation will be paid to the land owner in case of private land in line with

	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 located in the mine lease area will be shifted or not. The issues relating to shifting of Village including their R&R and socio-economic aspects should be discussed in the report.	govt. scheme.
20.	One season (non-monsoon) primary baseline data on ambient air quality (PM_{10}, SO_2 and NOx), 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	Base line study was carried out for one (non-monsoon) season from Oct'13 to Dec'13. Details are provided in Chapter III (pg no. 40-45) of the Report. The locations of the monitoring stations were decided on the basis of prevailing micro - meteorological conditions (Wind direction & wind speed) of the study area. The windrose has been given in Chapter III (pg no. 41) of the Report. One location has been selected in downwind direction within 500 m from the lease boundary. Date wise collected baseline AAQ data is attached as **Annexure III** The location of the monitoring sites has been shown in Map No 4 in Chapter III.

	composition of PM_{10}, particularly for free silica, should be given.	
21.	Air quality for modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality Contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map	Air quality modeling has been carried out for prediction of impact of the project on the air quality of the area. Line Source Model (published by USEPA) has been used taking into account impact of movement of vehicles which is incorporated in Chapter IV (pg no. 83) of the Report. The windrose showing pre-dominant wind direction has been indicated in Chapter III (pg no. 41) of the Report.
22.	The water requirement for the project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The total water requirement for the project will around 4.5 KLD. The break-up for water is given in Chapter II (pg no. 37) of the Report.
23.	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Necessary clearance for drawl of water has been obtained and attached as **Annexure-VIII.**
24.	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.	The project do not consume any process water except for drinking, dust suppression & plantation. Plantation is proposed, which will increase the water holding capacity & help in recharging of ground

		water. No artificial rainwater harvesting is proposed for the present project.
25.	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.	There will be no impact of the project on the ground water quality as the mining will be carried out up to a depth of 1.5 meter bgl or above ground water table whichever comes first No mining will be done in monsoon affecting surface water. The mining project will also be done in dry area of river bed; hence there will be no impact on the surface water as well.
26.	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. 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.	Mining will be done from the top surface to about 1.5 m below ground level or above ground water level; whichever comes first. As studied the ground water level in pre-monsoon is 3.5 m bgl in and in post-monsoon season is 3m bgl. So there will be no intersection with groundwater.
27.	Details of any stream, seasonal or otherwise, passing through the lease area and modification/ diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	The lease area lies on the bed of Aasan River, which is a tributary of River Yamuna. During mining, it will be ensured that excavation will be done away from the river stream. Moreover no modification/ diversion of the river is proposed, hence there

<table>
<tr><td></td><td></td><td>will be no impact on the hydrology as such.</td></tr>
<tr><td>28.</td><td>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.</td><td>
<table>
<tr><td>Site elevation</td><td>Highest: Approx. 479m AMSL
Lowest: Approx. 468m AMSL</td></tr>
<tr><td>Working depth</td><td>1.5 m (Maximum)</td></tr>
<tr><td colspan="2">Groundwater depth</td></tr>
<tr><td>Pre-monsoon</td><td>3.5 m bgl</td></tr>
<tr><td>Post-monsoon</td><td>3 m bgl</td></tr>
</table>
(***Source: GCWB, District Dehradun, Uttarakhand***)

Schematic diagram showing the above features is given in Chapter II (pg no. 33).

Surface plan of the lease area are attached as with the report as **Annexure II (a)**</td></tr>
<tr><td>29.</td><td>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.</td><td>Plantation will be carried along the river banks or along the road sides or near the civic amenities in consultation with local authority or govt. body as it is not feasible to develop green belt around the lease area which lies on the river bed.</td></tr>
<tr><td>30.</td><td>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)</td><td>There will be an increase of 111 trucks/trolleys carrying the minerals per day. The impact due to this has been detailed in Chapter IV (pg no. 89) of the Report.</td></tr>
</table>

	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.	
31.	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA report.	A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipments, etc. Details are given in Chapter II (pg no. 37) of the Report.
32.	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.	As the mine area lies on the river bed, the area will be reclaimed naturally with sediments, gradually during monsoon seasons. There will be construction of ramps, temporary rest shelters during operational phase; However these will be removed and the banks will be restored at the time of mine closure.
33.	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	Plantation will be carried along the river banks or along the road sides or near the civic amenities in consultation with local authority or govt. body as it is not feasible to develop green belt around the lease area which lies on the river bed. As the proposed project is new, no plantation has been done earlier

	species to be planted. The details of plantation already done should be given.	
34.	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP.	Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures for air pollution control has been proposed (given in Chapter IV (pg no. 83) of the report). Each labour will undergo pre-placement medical examination. Thereafter periodical heath check up will be arranged as stated in the Chapter VII (pg no. 115) of the report.
35.	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	The proposed project being a small scale manual mining projects, there will be hardly any process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation of trucks. However health camps & awareness programs will be arranged for them. Details are given in Chapter VII (pg no. 115) of the report
36.	Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.	Socio-economic significance provided to the local community i.e. to the nearby villagers is given in Chapter VII (pg no. 114) of the Report.
37.	Detailed environmental	The detailed environmental

	management plan 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.	management plan to mitigate the environmental impacts has been mentioned in Chapter VIII (pg no. 120) of the Report.
38.	Public hearing points raised and commitment of the project proponent on the same along with time bound action plan to Implement the same should be provided and also incorporated In the final EIA/EMP Report of the Project.	Details of public hearing are given in Chapter VI (pg no. 99). Public hearing proceedings of the project along with action plan & budget allocation has been attached as **Annexure-XII A & XII B**.
39.	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the project should be given.	There is no litigation pending against the project. The LoI has been issued from Dept. of Geology & Mining Unit, Govt. of Uttarakhand to carry out mining operation in the proposed area.
40.	The cost of the project (capital cost and recurring cost) as well as the cost towards implementation of EMP should clearly be spelt out.	The capital cost of the project is 16.30 Lakhs. The costs like for project monitoring & EMP has been given in Chapter V & VIII (pg no. 124) respectively.
41.	Details of replenishment studies.	The mining project being on river bed the replenishment will be natural. Of the quantum of minerals which will be excavated, only sand & *bajri* is replenishable and sometimes, the boulders which may roll or come into the lease area. The project proposal for replenishment study from FRI is

		attached as **Annexure-IX**
42.	Details of Transportation of mined materials as per Indian Road Congress for both the ways with loaded as well unloaded traffic load and its impact on Environment.	The details of transportation for loaded as well as unloaded trucks with anticipated impacts due to transportation & its mitigation measures are given in Chapter IV (pg no. 83) of the Report
43.	Study on Cumulative impact due to sand mining.	There will be cumulative increase in traffic load due to the adjoining projects. The detailed cumulative analysis is attached as **Annexure X**
44.	Study of Impact of mining on plankton.	As the mining will be carried out on the dry part of the allotted area, as such there will be no impact on the planktons.
45.	Cluster approach for collection of baseline data shall be followed.	For collection of baseline data, it has been considered cluster wise.
46.	Appropriate Disaster Management safeguards in view of the seismicity of the area.	The project area lies in Seismic Zone IV, which implies that this is highly prone to earth quakes. However there are no built in structures or permanent constructional activity for the project which would get affected. As a part of disaster management, mock drills will be conducted and disaster warnings will be given. A comprehensive Disaster Management Plan is attached as **Annexure XI**
47.	Clearance under the Wildlife(Protection) Act, 1972 from the Standing Committee of National Board for Wildlife shall	As there is no wildlife sanctuary present within the study area, hence no clearance from NBWL is

	be obtained.	required.

General Points to be followed as per ToR:

a	All documents may be properly referenced with index, page numbers and continuous page numbering	Complied.
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	Relevant details i.e. the period & sources of data have been mentioned in EIA-EMP Report.
c	Where the documents provided are in a language other than English, an English translation should be provided	Yes, the same will be provided, in case of documents are in a language other than English.
d	The Questionnaire for environmental appraisal of mining projects as prescribed by the ministry shall also be filled and submitted.	The questionnaire for environmental appraisal of the project is attached in the report as **Annexure IV**.
e	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 should be followed	Instructions for the proponents and consultants issued by MoEF from time to time have been taken into consideration while preparing the EIA report.

f	Changes, if made any in the basic scope and project parameters (as submitted in Form I and PFR for securing TOR) should be brought to the attention of MoEF with reasons for such changes and permission should be sought out, as 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 P.H process) will entail conducting the PH again with revised documentation.	No changes have been done in the basic scope and project parameters as submitted in Form I and PFR.
g	As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, you are requested to submit certified report of the status of compliance of the conditions stipulated in the environmental clearance for the existing operations of the project by the Regional Office of Ministry of Environment & Forests, if applicable.	Not applicable as this is a new mine for which Environmental clearance is yet to be received.

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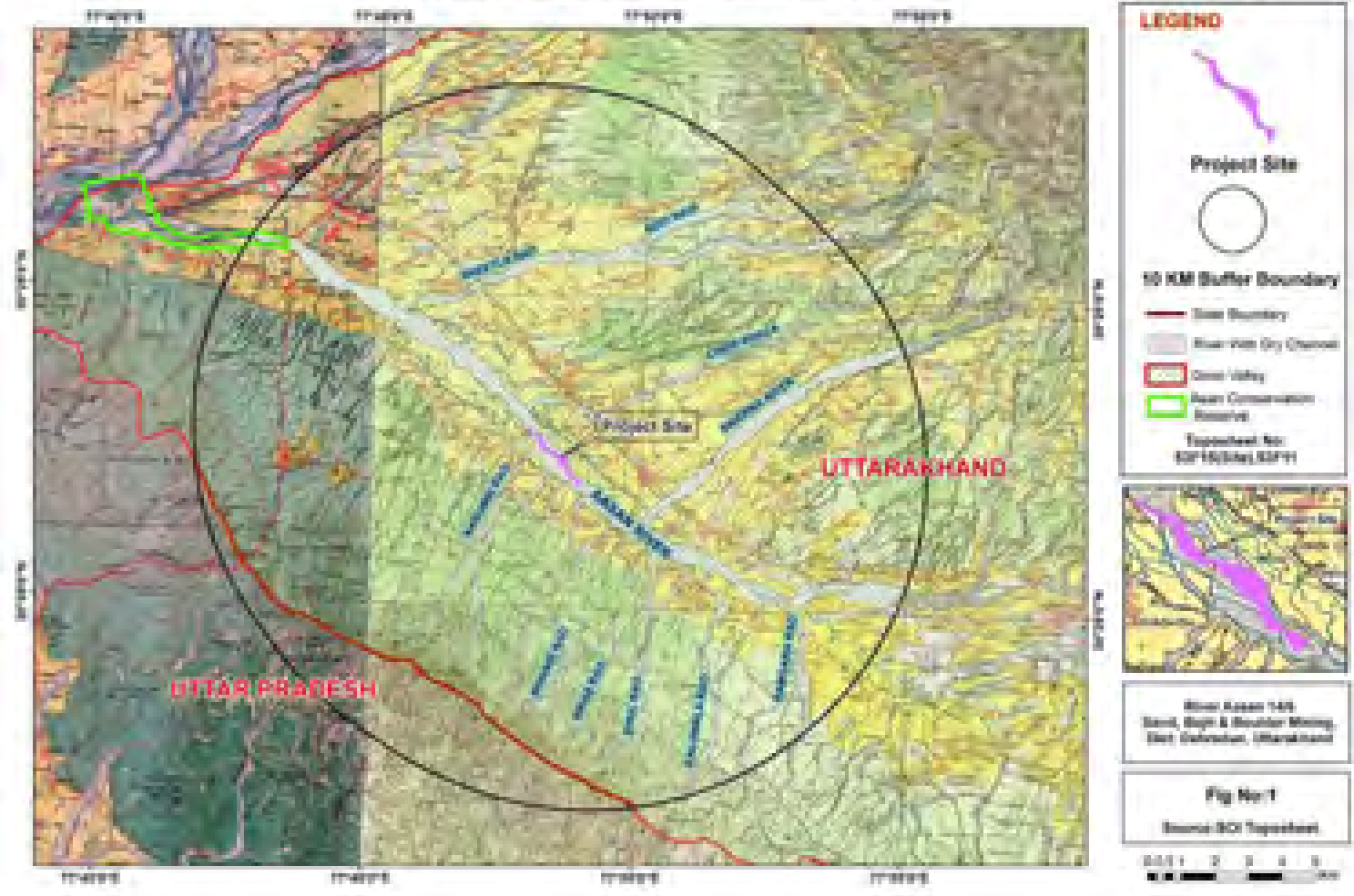
10 KM BUFFER MAP OF THE STUDY AREA



CHAPTER-II
PROJECT DESCRIPTION
INDEX

2.0 TYPE OF PROJECT

The project is proposed for the excavation of Sand, *Bajri* & Boulder from the bed of Aasan River. It is an opencast mining project where the entire activity will be done manually.

2.1 NEED FOR THE PROJECT

The project site lies on river Aasan which is a tributary of Yamuna river. These rivers get recharged by the rain water and carries with it sediments, consisting of sand, *bajri*, silt, clay, etc during every monsoon season. As the river beds are filled with sediments, hence it is quite necessary to clear the excessive sediment load from the rivers at the earliest, which otherwise will damage large tracts of land lying on both the banks of the river. Hence the mining activity will channelize the river.

Apart from this the project will generate various employment opportunities especially to the local people hosting the mining project.

2.2 LOCATION DETAILS

River Aasan Lot No. 14/6 Sand, Bajri & Boulder Mining Project is located in Village: Sabhawala, Indripur, Lakshmipur & Sahaspur Tehsil: Vikasnagar, District: Dehradun, Uttarakhand. The lease area falls in Survey of India Toposheet 53F15 (Site). The lease co-ordinates and connectivity details are listed below:

Table 2.1:-lease co-ordinates

Latitude	30°22'55.45"N to 30°22'3.32"N
Longitude	77°47'57.12"E to 77°48'58.89"E

The lease area is connected by an un-metalled road and then through metalled road via village Rampur chhata and ultimately connects to NH-72 at a distance of 1.5 km in NE direction.

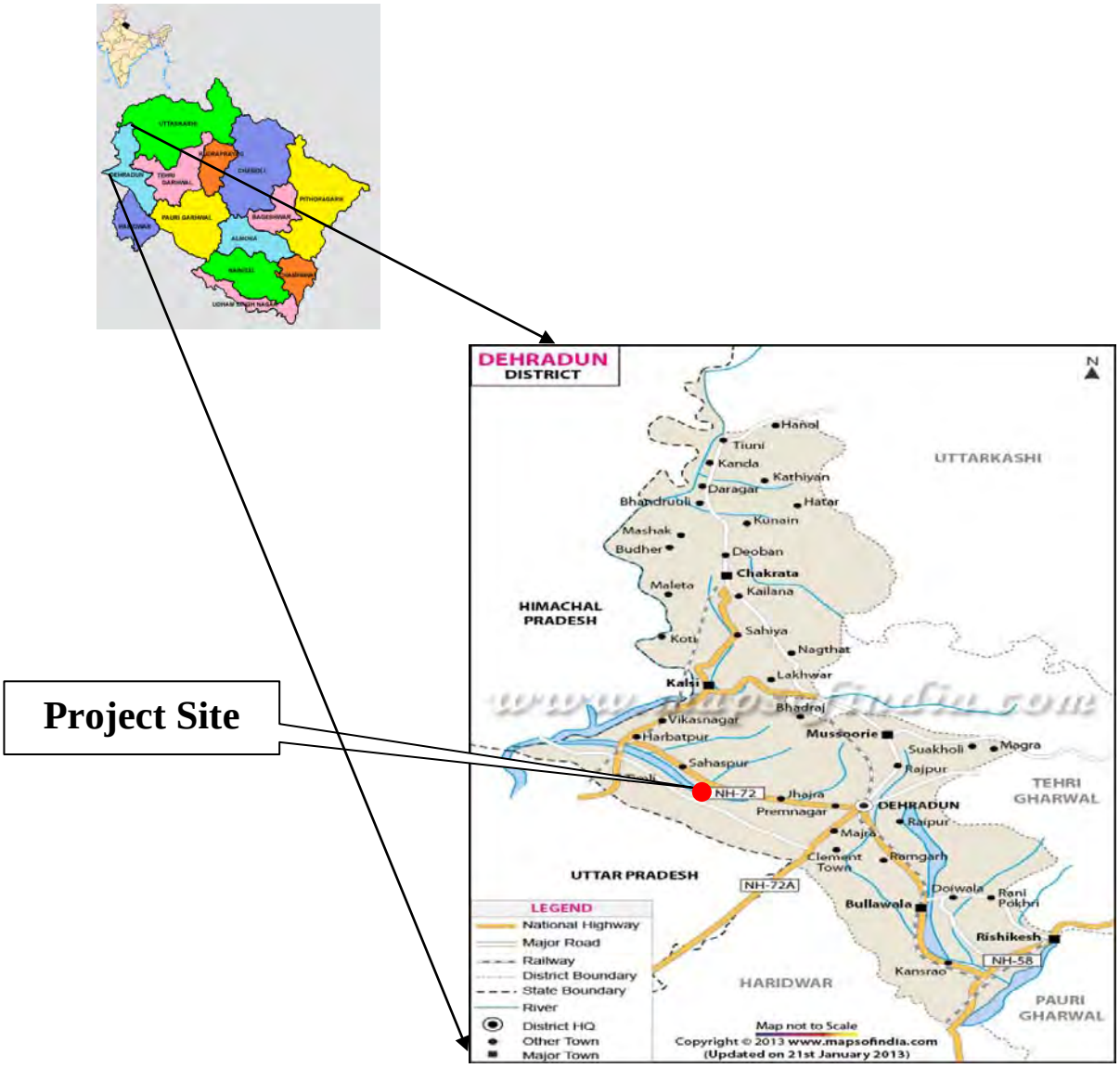
2.2.1 Lease Hold Area

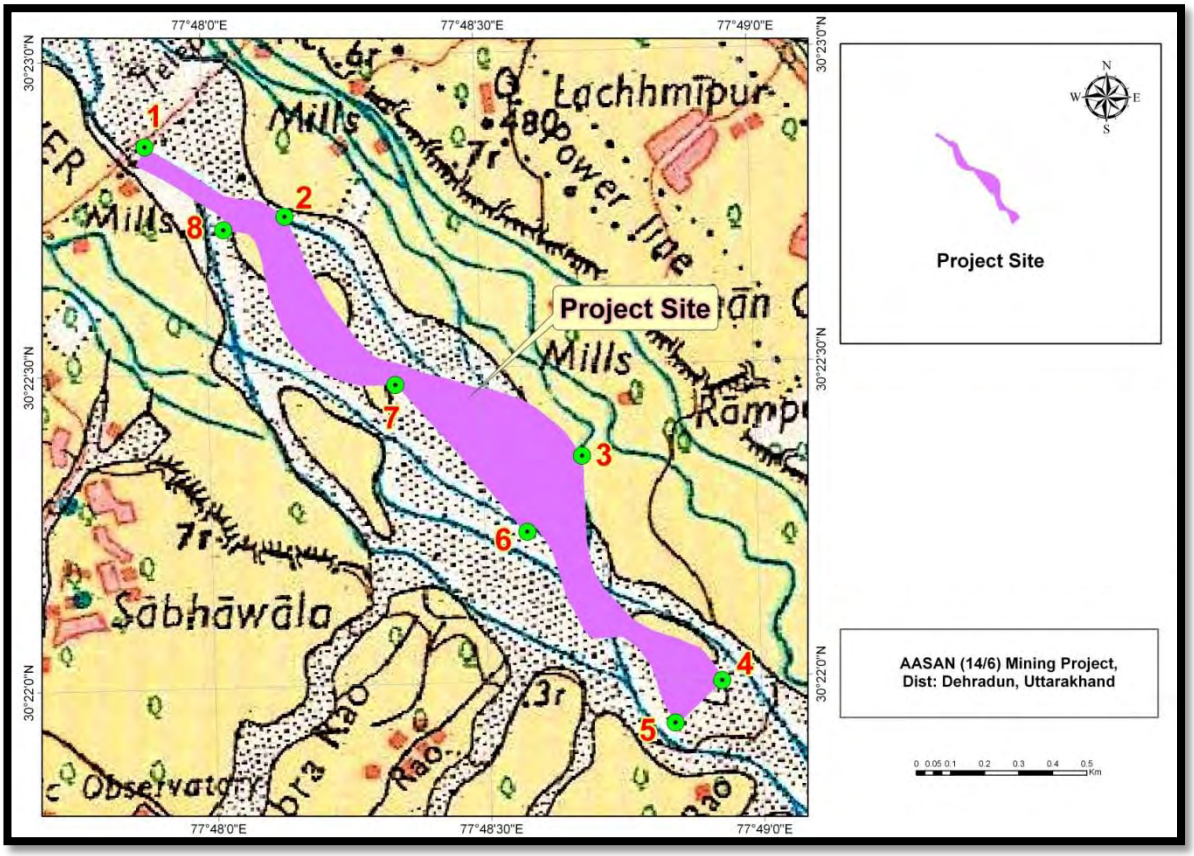
The lease hold area of 32.709 ha lies in the bed of Aasan River, decided as per the Letter of Intent vide Letter No. 589/Bhu. Khani.E./2012-13 dated 23-1-2013 issued by Geology & Mining Unit, Directorate of Industries, Govt. of Uttarakhand. The site has been inspected jointly by various departments and has been recommended for mining. The Joint Inspection Report has been attached as **Annexure I (b)**

Table 2.2 Details of the Lease Hold Area

Lot No.	Khasra No.	River	Village	Area in Hectares
14/6	Khasra No. 2मि 1मि 585मि 593 मि 594 मि	Aasan	Sabhawala, Indripur,Lakshmipur, Sahaspur	32.709

The general location & Project site layout with pillar coordinates are shown below:





Sl.No.	Latitude	Longitude
1	30°22' 55.450" N	77°47' 57.120" E
2	30°22' 48.633" N	77°48' 12.169" E
3	30°22' 25.174" N	77°48' 44.214" E
4	30°22' 3.320" N	77°48' 58.890" E
5	30°21' 59.528" N	77°48' 53.749" E
6	30°22' 18.057" N	77°48' 37.996" E
7	30°22' 32.353" N	77°48' 23.881" E
8	30°22' 47.506" N	77°48' 5.388" E

Pillar Coordinates of the proposed project

2.2.2 TOPOGRAPHY & GEOLOGY

Topography

Dehardun can be divided into two distinct tracts i.e. the montane tract and the sub-montane tract. The Montane Tract consists entirely of a succession of mountains and gorges. Below the Montane Tract follows the Sub-Montane Tract, which is the famous Doon valley bounded by Shiwalik hills in the south and outer scarp of the Himalayas in the north.

The sub-montane tract which consists of two parallel running tracts, i.e. (a) Bhangar; and (b) Terai

(a) Bhangar: It extends upto 30 km in the west and narrows towards east. It is just below Himalayas. This tract has little surface drainage.

(b) Terai: It is low marshy area with tall grasses and scrubs. Rainfall is heavy and streams are numerous.

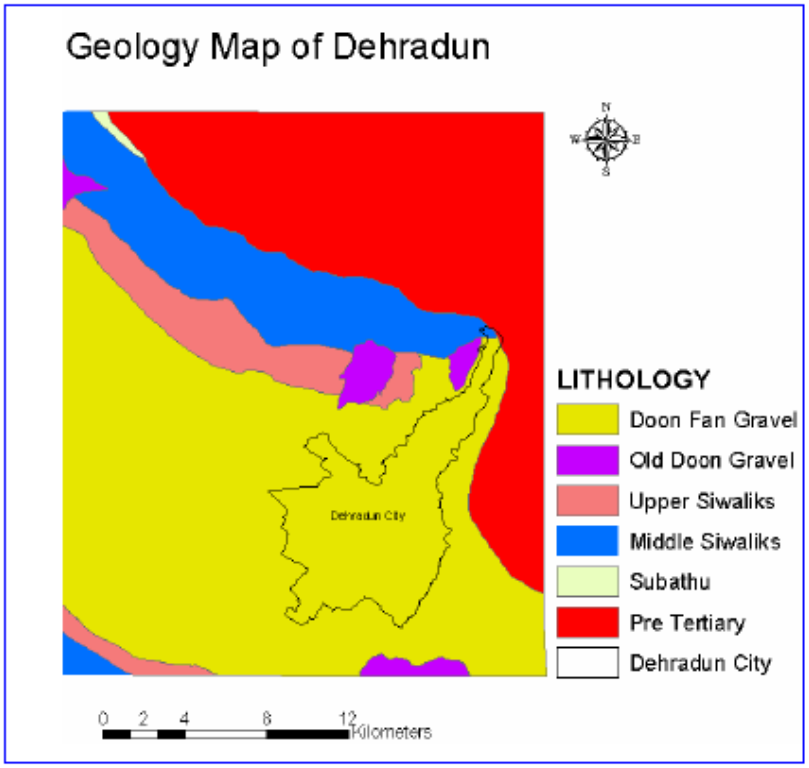
The Sub-Montane Tract is situated in foothills of Himalayas. The Sub-Montane exhibits a general fall of slope from the foothills region. The slope gradually decreases and becomes almost flat at the Doon area, where the site lies.

Geology

Dehradun valley was formed as an intermontane valley between lesser Himalaya in the north and the Siwaliks in the south. The present Doon valley is developed in two phases. In the first phase, around 18 million years ago there was an upliftment in the Himalaya around the Main Boundary Thrust (MBT) that raised the Mussorie Range and the Lower Himalaya. It resulted in the formation of a synclinal depression known as Doon Syncline, in which the eroded sediments of the up-lifted part were deposited and this continued for the long period. In the second phase, around 0.5 million years ago another tectonic event uplifted the Siwalik Range strata along the Himalayan Frontal Thrust (HFT) and the Doon valley came into existence (Thakur, 1995) *(Source: Seismic response analysis of Dehradun_pdf)*

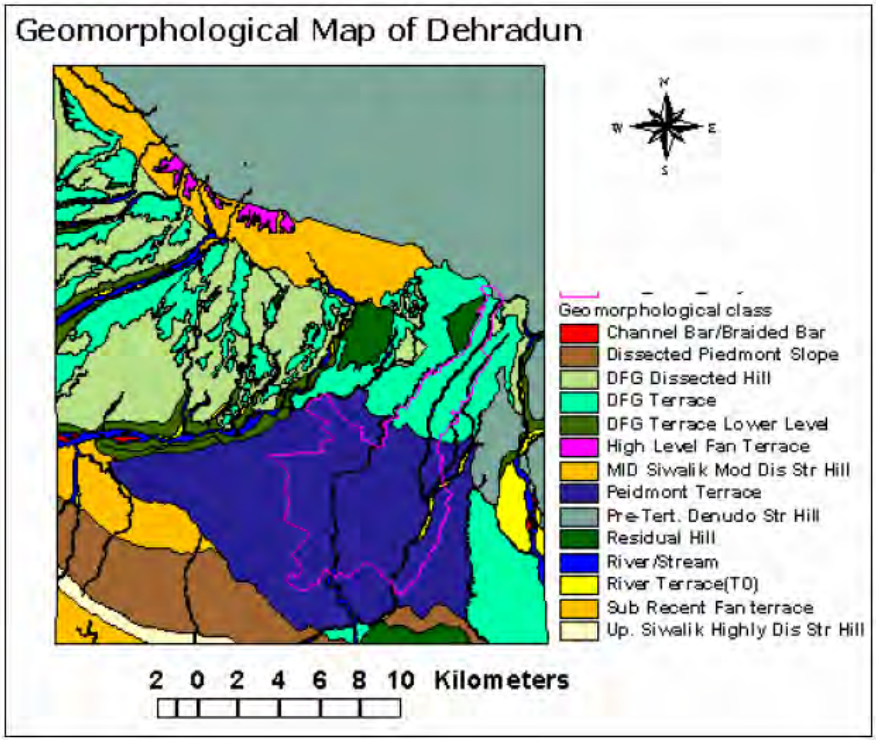
Table 2.3 Geological Succession

Age	Geological units/ Formations	Lithology
Recent	River Alluvium	Loose unconsolidated materials of sand, silt and clay derived from Upper Siwalik and Lesser Hima-laya
Sub Recent to Late Pleistocene	Young Doon Gravel	Sub rounded boulders and gravels of sandstone and quartzite derived from Siwalik and Lesser Himalaya
	Old Doon Gravel	Big angularand sub-rounded boulders of quartzite and sand-stones embedded in clay.
Unconformity		
Late Pliocene To Middle Miocene	Upper Siwalik	Coarse boulders,conglomerates and clay
	Middle Siwalik	Hard and soft sand stone and clay intercalation in pockets
	Lower Siwalik	Hard sandstone, interbeded withd stone
Main Boundary Thrust		
Palaeoceneto Early Eocene	Subathu Formation	Red shale and lenticular bands of sandstone
Krol Thrust		
Pre-Tertiary	Tal	Quartzites
	Krol	Dolomitic limestone, cherty red shale, sandstone, black shale.
	Blaini / Infra Krol	Boulder beds, slate, dark shale, pink dolomite, violate quartzite and shale
	Nagthat	Quartzite and slate
	Chandpur	Phyllite, slate and limestone
	Damta	Grey slate, quartzite and turbidites



Geomorphology

Doon valley is the largest intermontane synclinal longitudinal valley in the sub Himalayan region. Many rivers such as Ganga, Yamuna, Sheetla Rao, Jhakan Rao, Suswa and Asan contributed in the formation of local landforms of the valley. For different type of formations there is change in drainage pattern, as in the pre tertiary formations drainage pattern is dendritic and trellis, in the Siwaliks it is sub-parallel and dendritic whereas in the recent formations it is parallel and sinuous (Patel and Kumar, 2003). Geomorphologically the landforms in the area are formed due to erosion, deposition and tectonic activity. Nossin (1971) concluded that the valley has been uplifted by 315 to 420 meter due to differential movement along the MBT and Krol thrust. He recognised different level of fans in the valley that consist of Doon Gravel of pliestocene to recent age. Nakata (1972) suggested that the valley was formed by an intricate superimposition of alternate depositional and erosional phases caused by the climatic changes and crustal movement. *(Source: Seismic response analysis of Dehradun_pdf)*



2.2.3 CLIMATE

The district has within its limits lofty peaks of the Outer Himalayas as well as the Doon Valley with climatic conditions nearly similar to those in the plains.

The temperature depends on the elevation. The climate of the district, in general, is temperate. In the hilly regions, the summer is pleasant but in the Doon Valley, the heat is often intense. The temperature drops below freezing point not only at high altitudes but also even at places like Dehradun during the winters, when the higher peaks are under snow.

The summer starts by March and lasts up to mid of June when the monsoon sets in. Generally, the month of May and early part of June is hottest with mean temperatures shooting upto 36.2^{0}C at Dehradun and 24.8^{0}C at Mussoorie. The maximum temperature rises to over 42^{0}C at Dehradun while at Mussoorie it doesn't exceed 320C. Winter starts from November and continue upto February. The highest maximum temperature recorded at Dehradun was 43.9^{0}C on June 4, 1902 and that at Mussoorie was 34.4^{0}C, on May 24th 1949. The mean daily maximum temperature during winter is 19.1^{0}C at Dehradun and 10.2^{0}C at

Mussoorie. The mean daily minimum temperature in January is 6.1^{0}C at Dehradun and 2.5^{0}C at Mussoorie. In Mussoorie the temperature drops to about -6^{0}C to -7^{0}C when snow fall occurs. The lowest minimum temperature at Dehradun during winter was - 1.1^{0}C, on February 1st, 1905 and January 1945 while at Mussoorie it was -6.7^{0}C, on February 10th. The district receives an average annual rainfall of 2073.3 mm. Most of the rainfall is received during the period from June to September, July and August being the wettest months. The region around Raipur gets the maximum rainfall, while the southern part receives the least rainfall in the district. About 87% of the annual rainfall is received during the period June to September. *(Source: CGWB Dehradun_pdf)*

2.2.4 SURFACE DRAINAGE PATTERN

The proposed project lies on River Aasan which a tributary of river Yamuna. The Asan drainage flows towards North-West forming a river system with Aasan as a major stream and hence the drainage system is called Aasan river watershed. It merges with the major river Yamuna at Dhalipur.

Aasan River Watershed is a prominent catchment area in Doon valley at foot hills of Siwalik ranges in the Dehradun District of Uttarakhand. The catchment area has a length of about 40 km and width 18 km. The Aasan River is a third-order drainage system which charges with surface run-off during monsoon and base-flow during non-monsoon period.

Rainfall is moderate to heavy in this area and most of rainfall flows as surface run-off or flash-floods.

Aasan watershed consists of smaller watersheds and the area is bestowed with number of small streams around the major streams. *(Source: International Journal of Geology, Earth and Environmental Sciences ISSN: 2277-2081)*

Tributaries joining the Aasan River on its course are Darer Nadi, Noon River, Nimmi River, Ghulaita River, Swarna River, Chor Khala, Sheetla Rao and other Rao Rivers.

The project site lies on the River Aasan. There are following surface water sources are found in the study area:

1. Sheetla River
2. Rao Rivers
3. Chor Khala
4. Swarna Nadi
5. Koti Nadi
6. Mauti Nadi

The surface drainage pattern map of the area is attached as **Map No. 2**

2.2.5 WATERSHEDS

The descriptions of Watersheds of River Aasan are as given below.

Watershed	No. of Sub Watersheds	No. of Micro Water Sheds	Total Area (Ha.)
Aasan	3	18	82,088

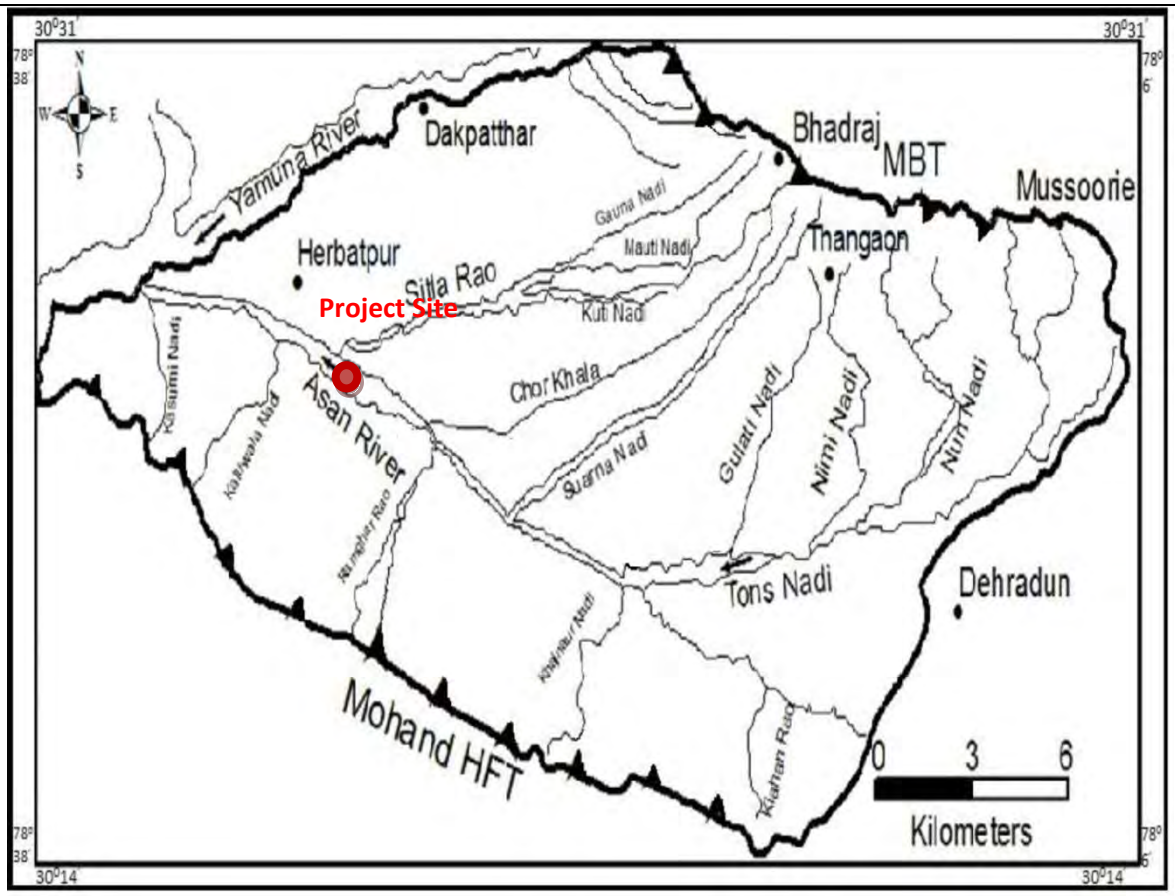
(Source: Uttarakhand State Perspective and Strategic Plan 2009-2027)

This watershed is a part of catchment of river Yamuna.

Number of Micro-watersheds in Dehradun.

District	No. of MWS	Area (ha)
Dehradun	95	3,05,043

(*Source: Uttarakhand State Perspective and Strategic Plan 2009-2027***)**



Drainage pattern and details of Asan Watershed area

Source: *International Journal of Geology, Earth and Environmental Sciences ISSN: 2277-2081*

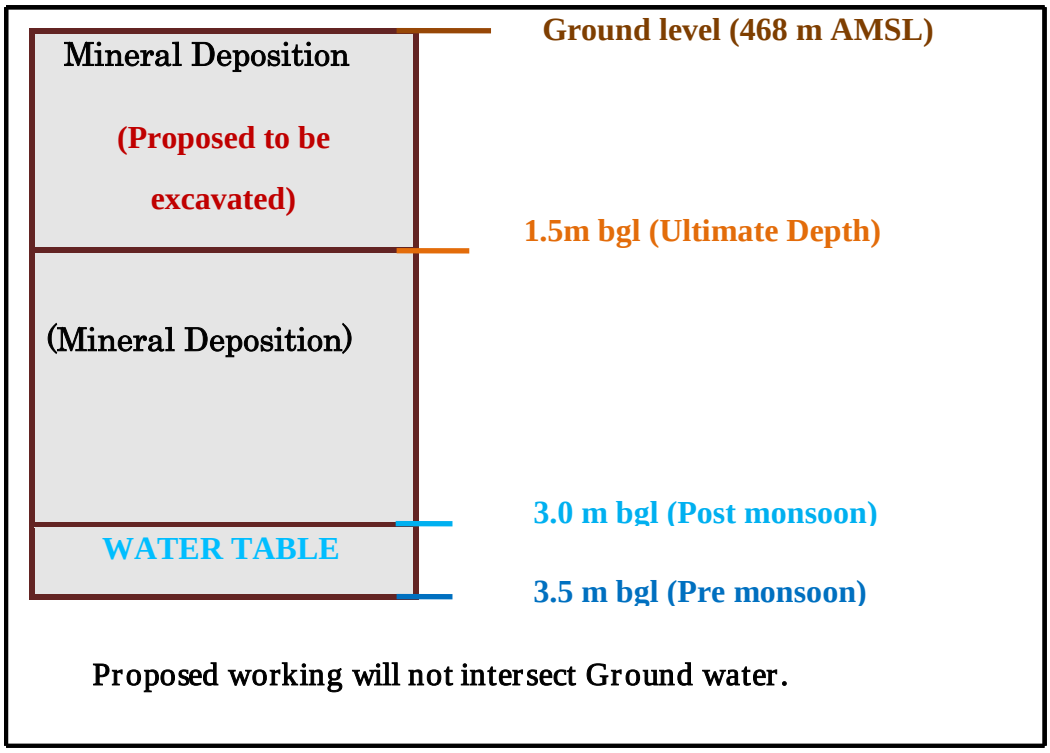
2.3 MINING

Mining will be done as per the guidelines of Uttarakhand Mineral Policy, 2011 and guidelines of Uttrakhand Minor Mineral Concession Rules, 2001.

- This is an open-cast mining project. The operation will be entirely manual with use of hand tools like shovel, pan, sieves, pick axes, etc. The minerals will be collected in its existing form and the sand will be separated from *bajri* and boulders by sieving process.
- Mining will be done leaving a safety distance from the banks i.e. 15% of the width of the river will be left for bank stability from both the banks.
- The deposit will be worked from the surface of the bed upto 1.5 m bgl or above ground water level, whichever comes first. Hence, at no point of time mining will intersect with ground water table.

- Mining will be done after leaving a safety distance i.e. 100 m from both sides of the bridge present in the lease area towards the mining lease area
- Mining will be done only during the day time and completely stopped during the monsoon season.

SCHEMATIC REPRESENTATION OF SITE ELEVATION, WORKING DEPTH & GROUND WATER



RESERVE (AVAILABLE QUANTUM) AND PRODUCTION (EXTRACTABLE QUANTUM)

The sediments proposed to be extracted are sand, *bajri* & boulder which are generally found in the river bed in the lease area. The sediments like sand/*bajri* along with silt & clay are brought into the bed through transport from the catchment area, are referred as "Wash Load". And the sediments which are in continuous contact with bed, carried forward by rolling/sliding are referred to as "Bed Load".

Reserve (Available Quantum):

The already existing quantity at the river bed in the lease area due to fresh depositions has been considered to be the quantum of mineral

available (**Reserve**) which may be mined out. In order to calculate this quantity, the lease area has been considered with an ultimate depth of 1.5 meter from the surface (excluding the boulder available on the surface). For the reserve tonnage estimation, the reserve quantity is multiplied with the bulk density of 2 tonnes per cum (for mixed sand and *bajri*).

The reserve for the site has been estimated to 7 lakh tonnes.

Production (Extractable Quantum):

However considering the factors such as geological disturbances, volume that cannot be mined due to flow of water and also considering the safety factor, approximately 2.5 lakh tonnes has been considered to as production or the extractable quantity from the mineable area for grant of Environmental Clearance. The amount of sand & *bajri* in the total extractable quantum is assumed to be around 70%, which is likely to be replenished due to sediment inflow, gradually during the monsoon seasons.

- Of the quantum of minerals which will be excavated, only sand & *bajri* is replenishable. Boulders which may roll or come into the lease area during high flow velocity of water or during floods.
- The quantum of replenishable amount for the purpose of EIA i.e. the wash load will be obtained by using widely acceptable sediment yield calculation method i.e. “Dendy-Bolton Formula”.
- Thus the extractable quantum in the first year would be limited to the available quantum. The extractable amount for the further years may vary depending on amount/rate of actual replenishment which is to be monitored by expert agencies every year.

Process:

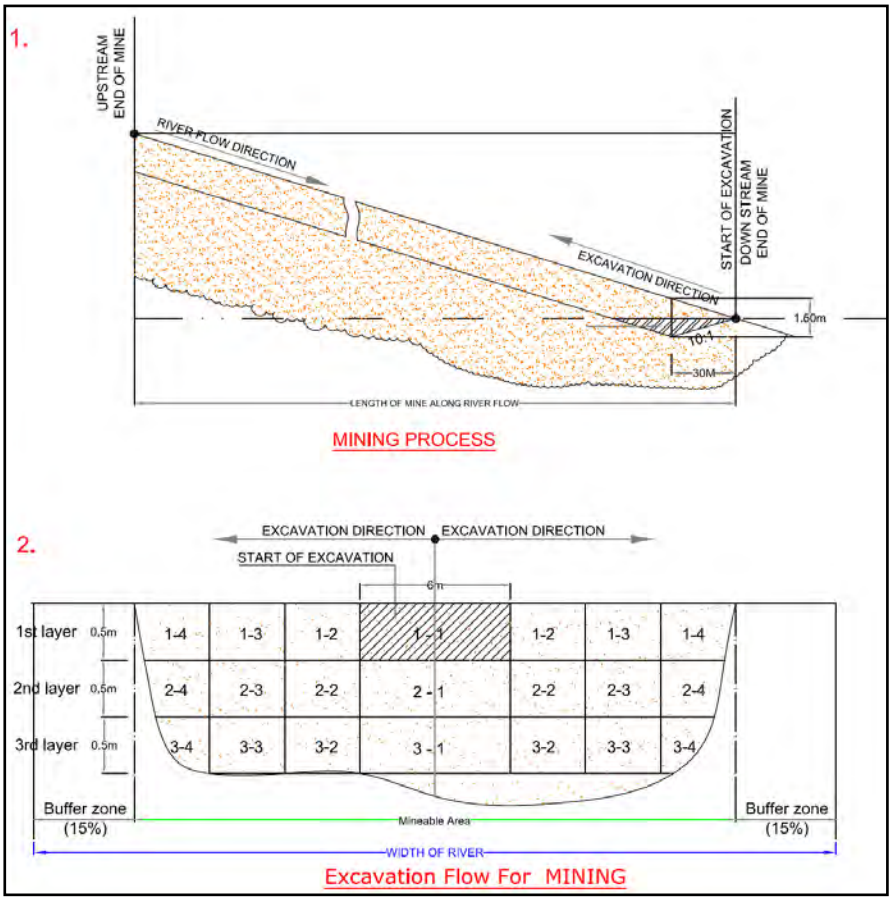
The mineable area will be demarcated with pillars after leaving the safety zone for bank stability.

1. Mining will be carried out only up to a depth of 1.5m, using hand tools like shovel, pan, sieve etc only during the day time.

2. Mining operations will be carried in non monsoon season only, so that the excavated area of the particular year gets replenished during the subsequent years.
3. The mining in the either area will be started from the downstream end from the middle of the cross-section towards the upstream side.
4. After the first layer is excavated, the process will be repeated for the next layers.

For the 2nd year, the mining again will be continued in a similar way starting from the downstream end moving upwards of the second part.

The schematic diagram showing the mining process is given below:



Man Power Requirement:

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

Table 2.4:- No. of Workers

S. No.	Category	Numbers
1.	Administrator	2
2.	Supervisor	4
3.	Mining workers	136
4.	Additional workers*	4
TOTAL		**146**

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

Waste –Disposal Arrangement

In this project, silt & clay is also a constituent of the River-Bed Material. The silt/clay generated have no market value, thus this material will be either used in plantation or filling low lying areas or as a spread in agricultural field.

Restriction on mining:

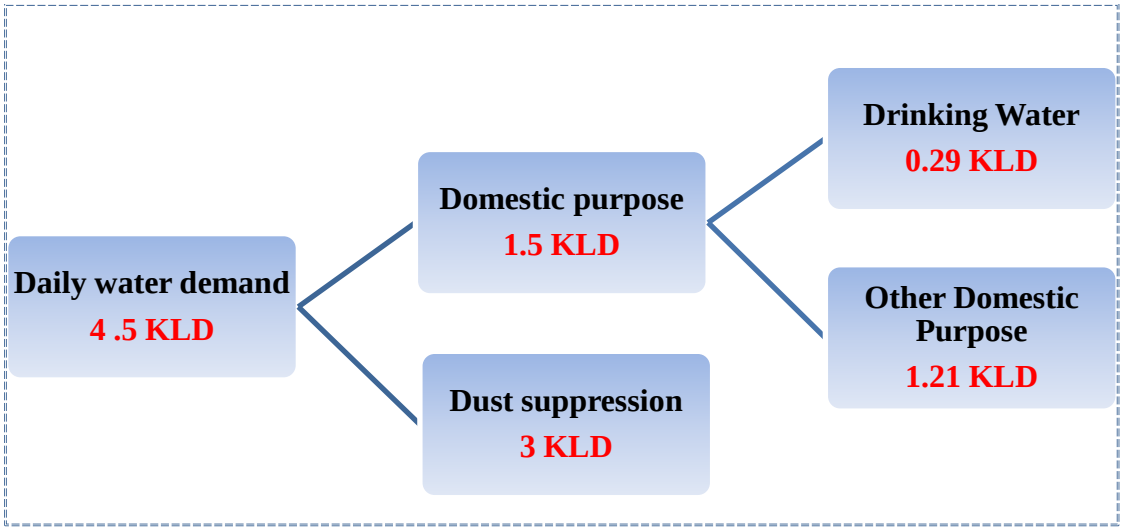
- As per JIR No mining operation shall be carried out within 100 m of canal, bridge, road, reservoir etc horizontally from the outer toe of the bank or the outer edge of the cutting as the case may be.
- The mining will not be allowed below the water table.
- The contractors will abide by Uttrakhand Minor Mineral Concession Rules, 2001 and guidelines contained in the River/Stream Bed Mining Policy and Land forms studies were taken into consideration.

- The contractors will abide at the time of mining with the term and condition as laid down under Mines Act, 1952 and Mines & Minerals (Regulation and Development) Act, 1957, Forest (Conservation) Act, 1980and the stipulations of the EIA/EMP.
- The contractor will abide by provision of Mines Act, 1952, Interstate Migrant Work Man Act, the contractor with the satisfaction of competent authority will provide drinking water, rest shelter, first aid box, welfare facilities as Central and State Govt. labor laws.

2.4 SITE FACILITIES AND UTILITIES

Water Supply

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



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

Temporary Rest Shelter:

A temporary rest shelter will be provided for the workers near to the site for rest.

Provisions will also be made for following in the rest shelter:

- First aid box along with anti-venoms to counteract poison produced by certain species of small insects, if any.
- Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

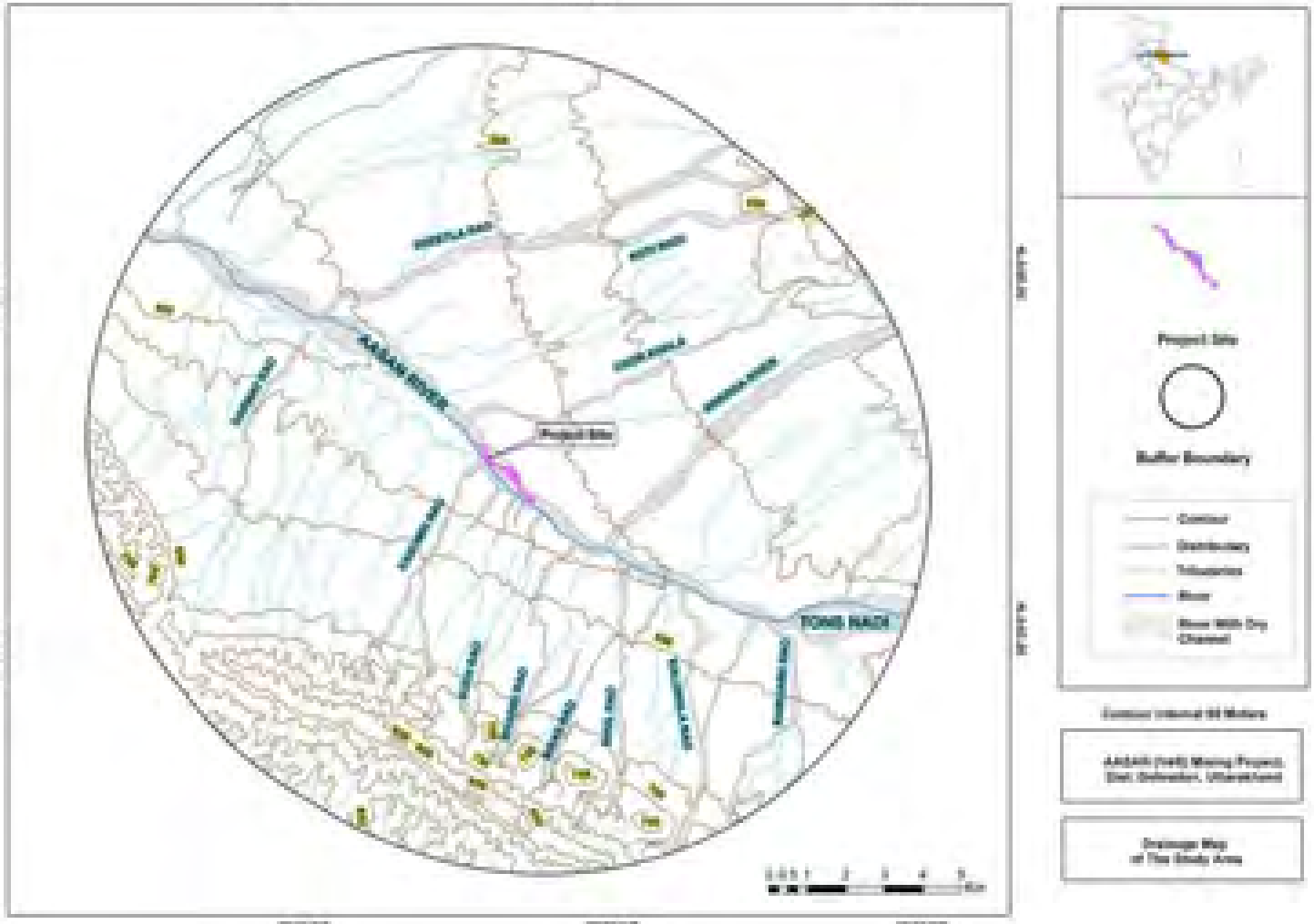
2.5 *STATUTORY* REQUIREMENTS

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

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

- Uttarakhand Mineral Policy, 2011
- Uttrakhand Minor Mineral Concession Rules, 2001
- The Mines Act, 1952
- The Mines and Mineral (Development and Regulation) Act, 1957
- Mines Rules, 1955
- Mineral Concession Rules, 1960
- Mineral Conservation and Development Rules, 1988
- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Forest (Conservation) Act, 1980

****


Project Site
TONS NADI
Project Site
Buffer Boundary
Contour
Drainage
Tributaries
River
River With Dry Channel
Contour Interval 50 Meters
Drainage Map of The Study Area

CHAPTER-III

DESCRIPTION OF ENVIRONMENT

INDEX

3.0 INTRODUCTION

This Chapter contains the description of baseline studies of the 10 km radius of the area surrounding River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mining Project. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed.

3.1 BASELINE DATA

3.1.1 LAND ENVIRONMENT

Land-Use/ land cover pattern of the study area delineating all the features has been studied through satellite imagery. The entire land use of the proposed area is a river bed which lies on Aasan River.

The land use of the study area is tabulated below and land use map is attached as **Map no.3**

Table 3.1: Land Use cover of the project study area

S.No.	Description	Area in Hectares	Percentage share in total area
1	River with dry channel	1730.75	4.75
2	settlement	788.03	2.16
3	Open land/Barren Land	1479.74	4.06
4	forest	18899.58	51.91
5	vegetation	581.59	1.61
6	Agricultural land	10490.85	28.81
7	Agricultural fallow land	2439.32	6.70
Total		**36409.86**	**100**

There will be no diversion or modification of any land use due to the mining activity.

3.1.2 AIR ENVIRONMENT

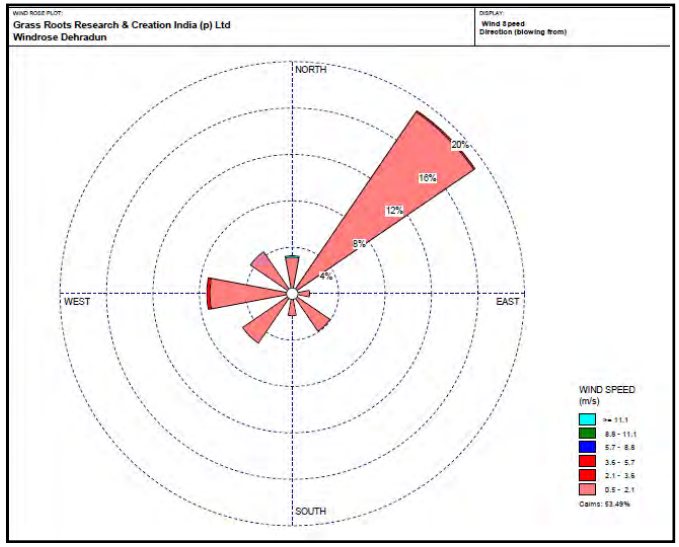
Ambient air quality monitoring stations were selected primarily on the basis of surface influence, demographic influence and meteorological influence. 24 hourly monitoring was carried out for SO_2, NO_2, $PM_{2.5}$ & PM_{10} twice a week at each station. This study was done during post-monsoon season for a period of 3 months (October'13 to December'13).

Month	Wind Speed (kmph)			Temperature (°C)			Relative Humidity (%)			Rain Fall * (mm)			Cloud Cover** (Octas of sky)
	Mean	Max	% of calm	Mean (Dry Bulb)	Highest	Lowest	Mean	Highest	Lowest	Total	24-hours Highest	No. of rainy days	Mean
October, 13	2.4	8.6	29	17.3	29.2	7.2	56.9	95.5	22.0	21.5	2.5	9	5
November, 13	2.0	6.3	27	16.0	27.3	6.0	56.6	95.7	21.8	0.2	0.1	2	3
December, 13	1.7	7.7	28	14.6	23.9	5.2	56.2	95.2	21.3	0.9	0. 3	3	2

a. Site-specific meteorological data

b. Wind Rose Diagram

Observation: The prominent seasonal wind direction is NE contributing approximately 19% of the total



b. Method of monitoring

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

Table 3.2: Methods adopted for PM_{10}, $PM_{2.5}$, SO_2 and NO_2

Parameters	Technique	Technical Protocol	Minimum Detectable Limit
$PM_{2.5}$	Gravimetric method	**CPCB Guideline Vol. I May' 2011**	**5 (µg/m³)**
PM_{10}	Gravimetric method	**IS 5182 (Part-XXIII)**	**5 (µg/m³)**
Sulphur Dioxide	Improved West and Gaeke	**IS-5182 (Part-II)**	**5 (µg/m³)**
Nitrogen Dioxide	Modified Jacob & Hochheiser	**IS-5182 (Part-VI)**	**6 (µg/m³)**

i. Particulate Matter (PM):-

The CPCB method and IS 5182 (Part-XXIII) adopt a very similar approach to particulate sampling. There are some differences in the expressions used, but they are generally of no practical significance. It is recommended that CPCB method is adapted.

ii. Equipment Calibration:

For accurate testing of emission sources, the components of the sampling train is calibrated by outsource and supplier (Master Calibrator) standards and solutions are used, calibrated under certified reference material. The Ambient air quality monitoring locations are marked in **Map No. 4.**

The ambient air quality data were collected to find the existing GLC. The data is given in Table No. 3.3 (ii).

Table 3.3 (i) Ambient air quality monitoring stations

S.No	Location	Station name	Distance (approx.) (km)	Approx Direction	Zone (Core/ Buffer)
1.	**AQ1**	Selaqui	3	ESE	Buffer zone
2.	**AQ2**	Mahmudnagar	2	NE	Buffer zone
3.	**AQ3**	Shishambara	3	SE	Buffer zone
4.	**AQ4**	Tiparpur	5	NW	Buffer zone
5.	**AQ5**	Project Site	-	-	Core Zone
6.	**AQ6**	Chhorba	5	N	Buffer zone

Table 3.3 (ii): Ambient Air Quality Status

Site	Particulars	$PM_{2.5}$ (µg/m³)	PM_{10}(µg/m³)	SO_2 (µg/m³)	NO_2 (µg/m³)
AQ1 (24 Observations)	**Minimum**	23.9	57.1	BDL	12.4
	Maximum	30.2	79.7	7.4	21.5
	Average	26.9	66.6	6.0	15.9
	98th Percentile*	29.6	77.4	7.3	20.9
AQ2 (24 Observations)	**Minimum**	31.1	63.3	BDL	16.1
	Maximum	43.2	79.2	6.5	21.5
	Average	34.8	69.2	5.3	17.5
	98th Percentile*	41.5	77.9	6.3	20.6
AQ3 (24 Observations)	**Minimum**	31.1	69.4	BDL	17.5
	Maximum	41.7	89.6	6.5	23.4
	Average	35.6	79.4	5.6	20.0
	98th Percentile*	40.8	88.9	6.4	22.6
AQ4 (24 Observations)	**Minimum**	33.5	67.9	BDL	15.2
	Maximum	41.5	85.4	6.3	20.8
	Average	36.8	78.3	5.7	17.7
	98th Percentile*	40.5	84.8	6.2	20.5
AQ5 (24 Observations)	**Minimum**	28.5	63.1	BDL	11.7
	Maximum	38.0	79.8	6.1	19.5
	Average	33.1	69.9	5.5	16.0
	98th Percentile*	37.8	78.9	6.0	18.9
AQ6 (24 Observations)	**Minimum**	24.9	58.5	BDL	10.2
	Maximum	32.8	82.4	6.4	14.8
	Average	28.4	70.1	5.7	12.9
	98th Percentile*	32.1	81.5	6.3	14.5
CPCB Standards (µg/m³)		**60**	**100**	**80**	**80**

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

Observations:

Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of PM_{10} amongst all the 6 AQ monitoring stations were found to be 57.1µg/m^3 at AQ1 and 89.6µg/m^3 at AQ3, respectively. As far as the gaseous pollutants SO_2 and NO_2 are concerned, the prescribed CPCB limit of 80µg/m^3 for residential and rural areas has never surpassed at any station. The minimum concentration of SO2 was below detectable limit, the maximum concentrations were found to be 7.4µg/m3 at AQ1, respectively. The minimum & maximum concentrations of NO_2 were found to be 11.7µg/m^3 at AQ5 and 23.4 µg/m^3 at AQ3 respectively.

Free SiO_2 (µg/m^3)

Table 3.3(iii) Free Silica details

S.No	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6
Maximum	1.59	1.58	1.79	1.70	1.59	1.6
Minimum	1.14	1.26	1.38	1.35	1.26	1.17

The standard for Respirable dust is 3mg/m^3 for 8 hour of working period where Free silica content should not exceed 5% as prescribed by Directorate General of Mines Safety.

Observations:

The minimum & maximum concentrations of SiO_2 were found to be 1.14µg/m3 at AQ1 & 1.79 µg/m3 at AQ3 respectively.

Air quality monitoring at village Kalyanpur

3.1.3 WATER ENVIRONMENT

a) Ground water

Block wise net available groundwater, stage of groundwater development and category (as on 2007)

Block	Type Area	Net available ground water reserve (ham)	Current draft for all uses (ham)	Stage Groundwater Development (%)	Category
Vikasnagar	Command	1780.61	1780.61	53.78	Safe
	Non-command	19824.35	19824.35	51.23	Safe

Net annual groundwater resources availability for various uses in Dehradun district.

Block	Command/Non. Command/ Total	Net Ground water Availability (ham)	Existing Ground water Draft for domestic and industrial supply (ham)	Allocation for domestic and industrial water supply up to 2025 (ham)
Vikasnagar	Command	1780.61	45.60	312.12
	Non-command	19824.35	483.62	2878.27

Three water samples were collected from the study area. The physico-chemical analysis of the water samples is given in the Table 3.3 (v).

The Ground water sampling locations are marked in **Map No. 4**

Table 3.3 (iv) Ground water sampling locations

S.No.	Location	Approx. Distance (km)	Approx. Direction	Core zone/ buffer zone
GW1	Kalyanpur	1	S	buffer zone
GW2	Mahmudnagar	2	N	buffer zone
GW3	Shishambara	5	SE	buffer zone

Table 3.3 (v) Physico-chemical properties of ground water (October-December, 2013)

S.No	Parameter	Limit (IS-10500:2012)		Unit	Oct	Nov	Dec
		Desirable Limit	Permissible Limit		Kalyanpur		
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.71	7.43	7.36
6	Total Hardness (as CaCO3)	200	600	mg/l	120	112	126
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.17	0.09	0.11
8	Chlorides (as Cl)	250	1000	mg/l	19	21	27
9	Fluoride (as F)	1	1.5	mg/l	0.4	0.6	0.3
10	TDS	500	2000	mg/l	177	198	215
11	Calcium(as Ca2+)	75	200	mg/l	29	27	30
12	Magnesium (as Mg2+)	30	100	mg/l	11	10	12
13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.03	0.05	0.03
15	Sulphate (as SO4)	200	400	mg/l	18	23	21
16	Nitrate(as NO3)	45	No Relaxation	mg/l	2	4	3
17	Phenolic Compounds (as C6H5OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.04	0.03	0.06
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.01	<0.01	<0.01
28	Alkalinity (as CaCO3)	200	600	mg/l	98	102	110
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.01	<0.01	<0.01
30	Boron (as B)	0.5	1	mg/l	0.2	0.2	0.1
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/100 ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Table 3.3 (v) Physico-chemical properties of ground water (October-December, 2013

S.No	Parameter	Limit (IS-10500:2012)		Unit	Oct	Nov	Dec
		Desirable Limit	Permissible Limit		Mahmudnagar		
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.45	7.29	7.23
6	Total Hardness (as CaCO3)	200	600	mg/l	108	114	118
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.12	0.09	0.11
8	Chlorides (as Cl)	250	1000	mg/l	14	17	23
9	Fluoride (as F)	1	1.5	mg/l	0.3	0.4	0.3
10	TDS	500	2000	mg/l	165	181	214
11	Calcium(as Ca2+)	75	200	mg/l	26	27	28
12	Magnesium (as Mg2+)	30	100	mg/l	10	11	12
13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.06	0.05	0.03
15	Sulphate (as SO4)	200	400	mg/l	14	18	22
16	Nitrate(as NO3)	45	No Relaxation	mg/l	3	2	3
17	Phenolic Compounds (as C6H5OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.03	0.06	0.05
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.01	<0.01	<0.01
28	Alkalinity (as CaCO3)	200	600	mg/l	98	103	115
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.01	<0.01	<0.01
30	Boron (as B)	0.5	1	mg/l	0.1	0.2	0.2
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/100ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Table 3.3 (v) Physico-chemical properties of ground water (October-December, 2013)

S.No	Parameter	Limit (IS-10500:2012)		Unit	Oct	Nov	Dec
		Desirable Limit	Permissible Limit		Shishambara		
1	Colour	5	15	Hazen	<5	<5	<5
2	Odour	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable	-	Agreeable	Agreeable	Agreeable
4	Turbidity	1	5	NTU	<1	<1	<1
5	pH	6.5-8.5	No Relaxation	-	7.74	7.38	7.39
6	Total Hardness (as CaCO3)	200	600	mg/l	249	227	238
7	Iron (as Fe)	0.3	No Relaxation	mg/l	0.14	0.08	0.12
8	Chlorides (as Cl)	250	1000	mg/l	44	27	33
9	Fluoride (as F)	1	1.5	mg/l	0.7	0.4	0.5
10	TDS	500	2000	mg/l	356	320	336
11	Calcium(as Ca2+)	75	200	mg/l	60	54	57
12	Magnesium (as Mg2+)	30	100	mg/l	24	22	23
13	Copper (as Cu)	0.05	1.5	mg/l	<0.01	<0.01	<0.01
14	Manganese(as Mn)	0.1	0.3	mg/l	0.06	0.03	0.04
15	Sulphate (as SO4)	200	400	mg/l	34	27	22
16	Nitrate(as NO3)	45	No Relaxation	mg/l	6	4	3
17	Phenolic Compounds (as C6H5OH)	0.001	0.002	mg/l	<0.001	<0.001	<0.001
18	Mercury (as Hg)	0.001	No Relaxation	mg/l	<0.001	<0.001	<0.001
19	Cadmium (as Cd)	0.003	No Relaxation	mg/l	<0.01	<0.01	<0.01
20	Selenium (as Se)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
21	Arsenic (as As)	0.01	0.05	mg/l	<0.01	<0.01	<0.01
22	Cyanide (as CN)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
23	Lead (as Pb)	0.01	No Relaxation	mg/l	<0.01	<0.01	<0.01
24	Zinc (as Zn)	5	15	mg/l	0.12	0.07	0.08
25	Anionic Detergent (as MBAS)	0.2	1	mg/l	<0.01	<0.01	<0.01
26	Chromium (as Cr6+)	0.05	No Relaxation	mg/l	<0.01	<0.01	<0.01
27	Mineral oil	0.5	No Relaxation	mg/l	<0.01	<0.01	<0.01
28	Alkalinity (as CaCO3)	200	600	mg/l	189	197	205
29	Aluminum (as Al)	0.03	0.2	mg/l	<0.01	<0.01	<0.01
30	Boron (as B)	0.5	1	mg/l	0.2	0.2	0.1
Bacteriological Parameter							
1	Total Coliform	Shall not be detectable		MPN/ 100ml	Not Detected (<2)	Not Detected (<2)	Not Detected (<2)
2	E.coli	Shall not be detectable		E.coli /100ml	Absent	Absent	Absent

Observation:

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

- pH varies from 7.23 to 7.74.
- Total hardness varies from 108 mg/l to 249 mg/l
- Total dissolved solids vary from 165 mg/l to 356 mg/l.

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

Fluorides and nitrates are within the permissible limits. Most of the parameters in ground water sources are well within the permissible limits as per IS: 10500-1991, Drinking Water Standards.

Groundwater sampling at village Kalyanpur

b) Surface water

Three water samples were collected from the study area from River Aasan. The Surface water sampling locations are marked in **Map No. 4.** The physico-chemical analysis of the water samples is given in the Table 3.3 (vii).

Table 3.3 (vi)
Surface water sampling locations

Station No.	Location	Direction	Distance (Km)	Core Zone/Buffer Zone
SW2	Upstream	NW	5 Km	Buffer Zone
SW1	Project Site	-	-	Core Zone
SW3	Downstream	E	5 Km	Buffer Zone

Table 3.3 (vii)
Physico-chemical properties of surface water (October, 2013)

S.No.	Parameter	Unit	Upstream	Project site	Downstream
1	pH	-	8.12	7.56	7.85
2	Dissolved Oxygen	mg/l	7.4	8.8	8.2
3	BOD (3 Days at 27 °C)	mg/l	3.5	1.6	2.1
4	Free Ammonia (as N)	mg/l	<0.1	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.70	0.55	0.70
6	Boron	mg/l	0.2	0.1	0.1
7	Conductivity	µmhos/cm	412	367	399
8	Temperature	(°C)	21	20	21
9	Turbidity	NTU	10	7	10
10	Magnesium hardness (as CaCO3)	mg/l	56	56	58
11	Total Alkalinity (as CaCO3)	mg/l	150	138	142
12	Chloride (as Cl)	mg/l	24	22	23
13	sulphate (as SO4)	mg/l	12	7	14
14	Nitrate (as NO3)	mg/l	1.2	0.5	1.1
15	Fluoride (as F)	mg/l	0.5	0.4	0.5
16	Sodium (as Na)	mg/l	20	10	14
17	Potassium (as K)	mg/l	1.4	1.3	1.3
18	TKN (as N)	mg/l	0.5	0.5	0.6
19	Total Phosphorous (as P)	mg/l	0.008	<0.01	<0.01
20	COD	mg/l	15	10	10
21	Phenolic compounds (as C6H5OH)	mg/l	<0.001	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.08	0.06	0.05
24	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01
25	Zinc (as Zn)	mg/l	0.08	0.05	0.07
26	Arsenic (as As)	mg/l	<0.01	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01	<0.01
30	TDS	mg/l	251	223	239
Microbiological Parameters					
1	Total Coliform	MPN/100ml	500	400	320
2	Faecal Coliform	MPN/100ml	220	170	110

Table 3.3 (vii)
Physico-chemical properties of surface water (November, 2013)

S.No.	Parameter	Unit	Upstream	Project site	Downstream
1	pH	-	8.15	7.52	7.82
2	Dissolved Oxygen	mg/l	7.6	8.9	8.3
3	BOD (3 Days at 27 °C)	mg/l	3.2	1.5	2.0
4	Free Ammonia (as N)	mg/l	<0.1	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.53	0.31	0.45
6	Boron	mg/l	0.1	0.1	0.1
7	Conductivity	µmhos/cm	399	358	384
8	Temperature	(°C)	20	19	19
9	Turbidity	NTU	8	6	9
10	Magnesium hardness (as CaCO3)	mg/l	58	56	57
11	Total Alkalinity (as CaCO3)	mg/l	148	135	139
12	Chloride (as Cl)	mg/l	23	20	21
13	sulphate (as SO4)	mg/l	10	8	13
14	Nitrate (as NO3)	mg/l	1.1	0.4	0.9
15	Fluoride (as F)	mg/l	0.4	0.3	0.5
16	Sodium (as Na)	mg/l	15	9	13
17	Potassium (as K)	mg/l	1.4	1.2	1.1
18	TKN (as N)	mg/l	0.4	0.4	0.5
19	Total Phosphorous (as P)	mg/l	<0.01	<0.01	<0.01
20	COD	mg/l	14	8	9
21	Phenolic compounds (as C6H5OH)	mg/l	<0.001	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.07	0.04	0.03
24	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01
25	Zinc (as Zn)	mg/l	0.08	0.05	0.06
26	Arsenic (as As)	mg/l	<0.01	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01	<0.01
30	TDS	mg/l	240	216	232
Microbiological Parameters					
1	Total Coliform	MPN/100ml	390	320	300
2	Faecal Coliform	MPN/100ml	140	130	110

Table 3.3 (vii)
Physico-chemical properties of surface water (December, 2013)

S.No.	Parameter	Unit	Upstream	Project site	Downstream
1	pH	-	8.32	7.65	8.12
2	Dissolved Oxygen	mg/l	7.9	8.5	8.1
3	BOD (3 Days at 27 °C)	mg/l	2.9	1.9	2.3
4	Free Ammonia (as N)	mg/l	<0.1	<0.1	<0.1
5	Sodium Adsorption Ratio	-	0.39	0.49	0.54
6	Boron	mg/l	0.1	0.1	0.1
7	Conductivity	µmhos/cm	398	373	394
8	Temperature	(°C)	19	18	19
9	Turbidity	NTU	7	5	9
10	Magnesium hardness (as CaCO3)	mg/l	61	55	57
11	Total Alkalinity (as CaCO3)	mg/l	152	146	152
12	Chloride (as Cl)	mg/l	21	19	19
13	sulphate (as SO4)	mg/l	9	7	10
14	Nitrate (as NO3)	mg/l	0.9	0.5	0.11
15	Fluoride (as F)	mg/l	0.5	0.5	0.7
16	Sodium (as Na)	mg/l	12	14	15
17	Potassium (as K)	mg/l	1.3	1.4	1.3
18	TKN (as N)	mg/l	0.5	0.4	0.5
19	Total Phosphorous (as P)	mg/l	<0.01	<0.01	<0.01
20	COD	mg/l	13	10	10
21	Phenolic compounds (as C6H5OH)	mg/l	<0.001	<0.001	<0.001
22	Lead (as Pb)	mg/l	<0.01	<0.01	<0.01
23	Iron (as Fe)	mg/l	0.07	0.05	0.05
24	Cadmium (as Cd)	mg/l	<0.01	<0.01	<0.01
25	Zinc (as Zn)	mg/l	0.07	0.04	0.08
26	Arsenic (as As)	mg/l	<0.01	<0.01	<0.01
27	Mercury (as Hg)	mg/l	<0.001	<0.001	<0.001
28	Chromium (as Cr)	mg/l	<0.01	<0.01	<0.01
29	Nickel (as Ni)	mg/l	<0.01	<0.01	<0.01
30	TDS	mg/l	240	223	238
Microbiological Parameters					
1	Total Coliform	MPN/100ml	400	260	270
2	Faecal Coliform	MPN/100ml	140	90	110

Observation:

The analysis results indicate that the pH ranges between 7.52 and 8.32. Dissolved Oxygen (DO) was observed in the range of 7.4 to 8.9 mg/l against the minimum requirement of 4 mg/l. BOD values were observed to be in the range of 1.5-3.5 mg/l.

The chlorides and Sulphates were found to be in the range of 18-28 mg/l and 7-14 mg/l respectively.

Bacteriological examination of surface water samples revealed the presence of total coliform in range of 260 MPN/100 ml to 500 MPN/100 ml against the limit of 5000 MPN/100 ml.

Based on the results it is evident that most of the parameters of the samples comply with 'Category B' standards of CPCB, indicating it is suitable for outdoor bathing (organized).

3.1.4 SOIL ENVIRONMENT

Soil may be defined as a thin layer of earth's crust, a medium for the growth of plants. The soil characteristics include both physical and chemical properties. The soil survey and soil sample were carried out / collected to assess the soil characteristics of the study area. Soil samples were collected from 3 locations and analyzed as per CPCB norms. The soil sampling locations are marked in **Map No. 4.** The physico-chemical characteristic of these soil samples is given in Table No. 3.3 (ix).

Table No. 3.3 (viii) Description of soil sampling locations

Station No.	Location	Direction	Approx. Distance (km)	Core Zone/Buffer Zone
SQ1	Kalyanpur (near Project Site)	S	1	Buffer Zone
SQ 2	Mahmudnagar	NW	2	Buffer Zone
SQ 3	Selaqui	ESE	3	Buffer Zone

Soil sampling at village Kalyanpur

Table 3.3 (ix)

Physico-chemical properties of soil of October-2013

S.No	Parameter	Unit	Kalyanpur	Mahmud nagar	Selaqui
1	Texture	-	Sandy Loam	Sandy clay loam	Sandy clay loam
	Sand	%	63.2	59.2	63.1
	Silt	%	19.1	19.6	11.8
	Clay	%	17.7	21.2	25.1
2	Ph (1:2)	-	7.84	6.68	7.61
3	Electrical Conductivity (1:2)	µmhos/cm	214.0	228	222
4	Cation exchange capacity	meq/100 gm	16.6	13.3	12.1
5	Exchangeable Potassium	mg/kg	51.0	103.0	69
6	Exchangeable Sodium	mg/kg	92.0	89.0	66
7	Exchangeable Calcium	mg/kg	2517.0	1987.0	1894
8	Exchangeable Magnesium	mg/kg	423.00	324.0	264
9	Sodium Absorption Ratio	-	0.45	0.49	0.38
10	Water Holding Capacity	%	24.8	26.1	24.9
11	Porosity	%	38.7	38.1	38.3

Observations:

Samples collected from identified locations indicate the soil is sandy clayey type which has low water retention potential .The pH value ranging from 6.68 to 7.84, which shows that the soil is alkaline in nature. The water holding capacity is found in between 24.8% to 26.1 %.

3.1.5 NOISE ENVIRONNENT

The noise levels within the study area were recorded using Sound Level Meter and noise monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986. The levels recorded are as stated in Table 3.3 (xi). The noise level monitoring locations are marked in **Map No.4.**

Table 3.3 (x): Noise quality monitoring stations

S. No.	Location	Station Name	Approx. Distance (km)	Direction	Zone (Core/ Buffer)
1.	NQ1	Project site	-	-	Core zone
2.	NQ2	Mahmudnagar	2	N	Buffer zone
3.	NQ3	Shishambada	6	SE	Buffer Zone
4.	NQ4	Tiparpur	3	E	Buffer Zone

Table No. 3.3 (xi): Noise level status

S. No.	Location	Zone	Leq LIMIT (as per CPCB Guidelines), in		Leq Value monitored, in dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
NQ1	Project site	Industrial Area	75	70	52.8	41.5
NQ2	Mahmudnagar	Residential Area	55	45	54.2	43.6
NQ3	Shishmbada	Residential Area	55	45	53.2	42.9
NQ4	Tiparpur	Residential Area	55	45	52.3	40.9

* Day Time Leq in dB(A) (6.00AM TO 10.00PM)
Night Time Leq in dB(A) (10.00PM TO 6.00AM)

Results

Noise monitoring reveals that the maximum & minimum noise levels at day time were recorded as 54.2 dB(A) at NQ-2 & 52.3 dB(A) at NQ4 respectively. The maximum & minimum noise levels at night time were found to be 43.6 dB(A) at NQ2 & 40.9 dB(A) at NQ4 respectively.

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

3.1.6 BIOLOGICAL ENVIRONMENT

Biological diversity comprises the variability of species, genus and ecosystems and is very crucial for maintaining the basic processes on which the life depends. Broadly it can be divided in to two types i.e. the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine but also contribute in improvement of essential environmental attributes like air, water, soil, etc.

Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment.

Physical Environment of the study area:

The proposed "River Aasan Lot No.14/6 Sand, *Bajri* & Boulder mining project" is located in broad Doon Valley within the Shivalik Hills of Lower Himalayan range. Administratively this area falls in district Dehradun of

Uttarakhand. Aasan a perennial tributary of river Yamuna drained the western part of Doon valley, where mining is proposed.

District Dehradun is situated in NW corner of Uttarakhand state and extends from N Latitude $29^0$58' to $31^0$02' 30" and E Longitude $77^0$34' 45" to $78^0$18' 30". It falls in Survey of India Toposheets Nos. 53E, F, G, J and K. The district is bounded by Uttarkashi district on the north, Tehri Garhwal and Pauri Garhwal districts on the east and Saharnpur district (UP) on the south. Its western boundary adjoins Sirmour district of Himachal Pradesh separated by Rivers Tons and Yamuna.

The total area of Dehradun district is 3088 km^2 with an average altitude of 640 m above MSL. The district comprises of six tehsils, namely Dehradun, Chakrata, Vikasnagar, Kalsi, Tiuni and Rishikesh. Further, it is divided into six developmental blocks, viz: Chakrata, Kalsi, Vikasnagar, Sahaspur, Raipur and Doiwala.

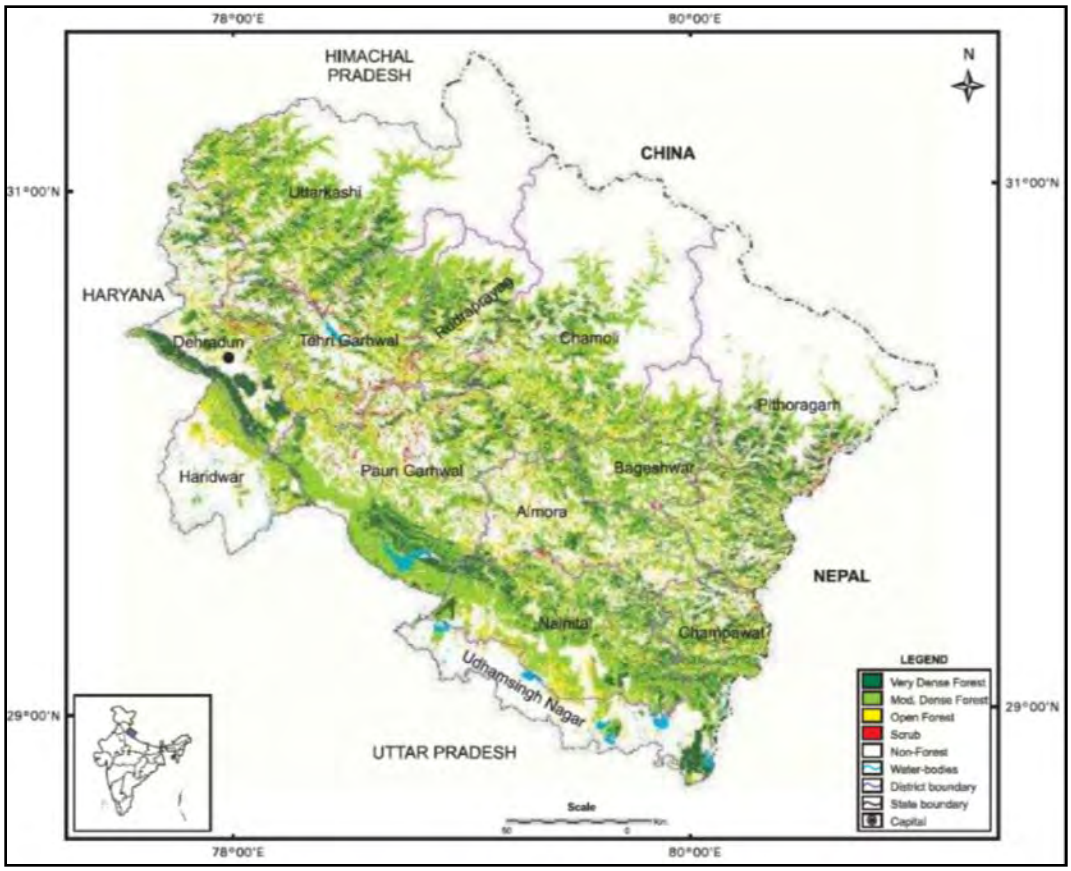
Forests cover in Dehradun District:

The forest cover in the Uttarakhand state, based on interpretation of satellite data of October-November 2008 mentioned in the India State of Forest Report 2011, is 24,496 km^2, which is 45.80 % of the state's geographical area. In terms of forest canopy density classes, the state has 4762 km^2 area under very dense forest, 14167 km^2 area under moderately dense forest and 5567 km^2 area under open forest. Out of 3088 km^2 total area of Dehradun district, 584 km^2 area is under very dense forest, 695 km^2 fall under moderately dense forest and 328 km^2 area is open forest. *(Source: India State of Forest Report; FSI 2011)*

Major forest types occurring in the state are Tropical Moist Deciduous, Tropical Dry Deciduous, Sub Tropical Pine, Himalayan Moist Temperate, Sub Alpine and Alpine Forests. Forests are largely distributed throughout the state with conifers and Sal being major forest formation. Following ten forest sub-types are present in Dehradun district as per Champion and Seth 1968.

1. Moist Siwalik Sal Forest (3C/C2a)

2. Northern Dry Mixed Deciduous Forest (5B/C2)
3. Dry Deciduous Scrub (5/DS1)
4. Subtropical Euphorbia Scrub (9/C1/DS2)
5. Mohru Oak Forest (12/C1b)
6. Moist Deodar Forest (12/C1c)
7. Western Mixed Coniferous Forest (Spruce, Blue Pine, Silver Fir) (12/C1d)
8. Himalayan Temperate Secondary Scrub (12/C1/DS2)
9. Low Level Blue Pine Forest (12/2S1)
10. Khair-Sissu Forest (5/152)



Maj or part of study area falls under **Northern Dry Mixed Deciduous Forest (5B/C2)** forest subtype.

The state has six National Parks, six Wildlife Sanctuaries and two Conservation Reserves covering cumulative area of 7376 km^2 which constitutes 13.79% of its geographical area. Nearest protected area is Aasan

conservation reserve and is situated at a distance of 18 km in NW direction from proposed project.

Forests in the study area:

1. Chandpur RF
2. Chuharpur RF
3. Laldhang RF
4. Charwa RF
5. Dobri RF
6. Atak Farm RF
7. Bain Khala Bit RF
8. Jhajra Block RF
9. Malhan RF
10. Darawat RF

Study period and methodology

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literature. Inventory of flora and fauna has been prepared on the basis of collected data.

Field study period: The ecological survey has been conducted for one season (post monsoon). All data were collected in post-monsoon period in order to reduce metrological biasness.

Methodology:

Table: 3.3 (xii) Mode of data collection & parameters considered during the survey

Aspect	Data	Mode of data collection	Parameters monitored
Terrestrial Ecology	Primary data collection	By conducting field survey	Floral and Faunal diversity
	Secondary data collection	From authentic sources like Forests Department of Dehradun and Forest Department of Dehradun and available published literatures	Floral and Faunal diversity and study of vegetation, forest type, importance etc.

Aquatic Ecology	Primary data collection	By conducting field survey	Floral and Faunal diversity
	Secondary data collection	From authentic sources like Forests Department of Dehradun and Forest Department of Dehradun and available published literatures	Floral and Faunal diversity and study of vegetation, forest type, importance etc.

General Vegetation Study of the area:

Area supports moderately healthy vegetation, the main forest species are along the Shivalik foothills. These Terai plains support the species of Sisam, Arjuna, Kanji, Khair, Saagaun, Subabul, Neem, Eucalyptus, Babul etc. Ground vegetation mainly consists of grasses and small shrubs. Useful fodder grasses, *Cynodon dactylon, Eleusine indica, Trifolium alexandrinum,* etc. can be seen growing in the area. The large weeds which infest uncultivated tracts are Aak *(Calotropis procera),* castor *(Ricinus communis),* Dhatura *(Datura metel)* and thorn *(Opuntia stricta).* Other noxious weeds and those which appear in crops are Pohli or Thistle *(Carthamus oxyacantha),* Shial Kanta *(Argemone mexicana),* kandyari *(Solanum xanthocarpum), Parthenium hysterophorus* and Bhang *(Cannabis sativa).*

Flora of the Core zone

The core zone comprises of Aasan river bed, where mining operation is proposed. This area consists of riparian vegetation in which aquatic and marshland plants are the main component. Most among them are weeds. No ecologically sensitive plant species has been reported from this area. Riparian vegetation is found along the river side. In stagnant water growth of hydrophytes likes *Hydrolea zeylanica, Ipomoea carnea, Ludwigia adscendens, Spilanthes paniculata, Typha latifolia*, etc. can be commonly observed.

Flora in and around Core zone

Flora of the Buffer zone: Buffer zone of the proposed project is Doon Valley and foothills of Shivalik. Many tree species are planted in the area because of their usefulness, economic and aesthetic values. The tree species observed in the area are, Aam (*Mangifera indica*), Jamun (*Syzygium cumini*), Bail (*Aegle marmelos*), Bakain (*Melia azedarach*), Bargad (*icus bengalensis*), Neem (*Azadirachta indica*), Peepal (*Ficus religiosa*), Popular (*Populas dealtoides*), Safeda (*Eucalyptus umbelatus*), Sisam (*Dalbergia sissoo*), etc.

In agricultural waste land and along the road side, growth of weeds like *Argemone mexicana, Cannabis sativa, Cenchrus cilitaris, Heteropogon contortus, Lantana camara*, *Parthenium hysterosporus*, etc. are very common. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Flora of surrounding area

Vegetation in and around human settlement:

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

A list of flora of the study area is enclosed as Table 3.3 (xiii)

Table 3.3 (xiii): Flora of the Core zone

Sl.No.	Species	Family	Habit
1	*Ageratum conyzoides*	Asteraceae	Herb
2	*Amaranthus spinosus*	Amaranthaceae	Herb
3	*Calotropis procera*	Asclepiadaceae	Shrub
4	*Cannabis sativa*	Canabaceae	Herb
7	*Chenopodium album*	Chenopodiaceae	Herb
8	*Datura innoxia*	Solanaceae	Shrub
9	*Hydrolea zeylanica*	Hydrophylaceae	Herb
10	*Ipomoea carnea*	Convolvulaceae	Shrub

Table: 3.3 (ix) Flora of the Buffer zone

Sl.No.	Species	Family	Habit
1	*Alternanthera paronychioides*	Amaranthaceae	Herb
2	*Alternanthera pungens*	Amaranthaceae	Herb
3	*Amaranthus spinosus*	Amaranthaceae	Herb

Sl.No.	Species	Family	Habit
4	*Colocasia esculenta*	Araceae	Herb
5	*Ageratum conyzoides*	Asteraceae	Herb
6	*Grangea maderaspatana*	Asteraceae	Herb
7	*Parthenium hysterophorus*	Asteraceae	Herb
8	*Cassia tora*	Fabaceae	Herb
9	*Cannabis sativa*	Cannabaceae	Herb
10	*Chenopodium album*	Chenopodiaceae	Herb
11	*Argemone mexicana*	Papaveraceae	Herb
12	*Brachiaria ramosa*	Poaceae	Herb
13	*Cynodon dactylon*	Poaceae	Herb
14	*Eleusine indica*	Poaceae	Herb
15	*Eragrostis tenella*	Poaceae	Herb
16	*Imperata cylindrica*	Poaceae	Herb
17	*Saccharum spontaneum*	Poaceae	Herb
18	*Physalis minima*	Solanaceae	Herb
19	*Adina cordifolia*	Rubiaceae	Tree
20	*Aegle marmelos*	Rutaceae	Tree
21	*Albizia lebbeck*	Fabaceae	Tree
22	*Anogeissus latifolia*	Combretaceae	Tree
23	*Artocarpus integrifolia*	Moraceae	Tree
24	*Azadirachta indica*	Meliaceae	Tree
25	*Bauhinia acuminata*	Fabaceae	Tree
26	*Bauhinia variegata*	Fabaceae	Tree
27	*Bombax ceiba*	Malvaceae	Tree
28	*Butea monosperma*	Fabaceae	Tree
29	*Cassia fistula*	Fabaceae	Tree
30	*Celtis australis*	Cannabaceae	Tree
31	*Dalbergia sissoo*	Fabaceae	Tree
32	*Delonix regia*	Fabaceae	Tree
33	*Emblica officinalis*	Phyllanthaceae	Tree
34	*Ficus racemosa*	Moraceae	Tree
35	*Ficus religiosa*	Moraceae	Tree
36	*Ficus tomentosa*	Moraceae	Tree
37	*Garuga pinnata*	Burseraceae	Tree
38	*Grewia optiva*	Tiliaceae	Tree
39	*Holoptelea integrifolia*	Ulmaceae	Tree
40	*Indigofera gerardiana*	Fabaceae	Tree
41	*Litchi chinensis*	Sapindaceae	Tree
42	*Luecena leucocephala*	Fabaceae	Tree
43	*Mangifera indica*	Anacardiaceae	Tree
44	*Melia azedarach*	Meliaceae	Tree

Sl.No.	Species	Family	Habit
45	*Morus alba*	Moraceae	Tree
46	*Nyctanthes arbor*	Oleaceae	Tree
47	*Ougeinia oojeinensis*	Fabaceae	Tree
48	*Polyalthia longifolia*	Annonaceae	Tree
49	*Ricinus communis*	Euphorbiaceae	Tree
50	*Shorea robusta*	Dipterocarpaceae	Tree
51	*Tectona grandis*	Lamiaceae	Tree
52	*Terminalia bellerica*	Combretaceae	Tree
53	*Terminalia chebula*	Combretaceae	Tree
54	*Toona ciliata*	Meliaceae	Tree
55	*Adina cordifolia*	Rubiaceae	Tree
56	*Aegle marmelos*	Rutaceae	Tree
57	*Albizia lebbeck*	Fabaceae	Tree
58	*Anogeissus latifolia*	Combretaceae	Tree
59	*Artocarpus integrifolia*	Moraceae	Tree
60	*Azadirachta indica*	Meliaceae	Tree
61	*Bauhinia acuminata*	Fabaceae	Tree
62	*Bauhinia variegata*	Fabaceae	Tree
63	*Bombax ceiba*	Malvaceae	Tree
64	*Butea monosperma*	Fabaceae	Tree

Aquatic Flora of the Buffer Zone

Aquatic flora referred to as phytoplankton and macrophytes (Plants that have adapted to living in aquatic environmentsuch as River, lakes, Ponds, dams). During the present investigation, some Phytoplankton and Macrophytic vegetation were collected from and different riverand streams present in the buffer area is given in tables below:

Table 3.3 X Phytoplanktons in the study zone:

Sl. No.	Name of the Individuals		
	Chlorophyceae		**Cyanophyceae**
1	*Ankistrodesmus* sp.	1	*Anacystis*sp.
2	*Ankistrodesmus falcatus*	2	*Aphanocapsa montana*
3	*Cosmarium* sp.	3	*Aphanothece* sp.
4	*Coelastrum* sp.	4	*Arthrospira massartiia*
5	*Oocystis* sp.	5	*Chroococcus* sp.
6	*Scenedesmus* sp.	6	*Gloeocapsa*sp.

7	*Scenedesmus dimorphos*	7	*Lyngbya*sp.
8	*Scenedesmus armatus*	8	*Merismopedia* sp.
9	*Spirogyra* sp.	9	*Microcystis flos-aquae*
10	*Tetraedron* sp.	10	*Nostoc*sp.
11	*Westella* sp.	11	*Oscillatoria* sp.
	Bacillariophyceae	12	*Spirulina* sp.
1	*Achnanthes* sp.		**Euglenophyceae**
2	*Amphora ovalis*	1	*Euglena* sp.
3	*Ceratonies arcus*	2	*Euglena acus*
4	*Cyclotella* sp.	3	*Trachelomonas* sp.
5	*Cymbella*tumida		**Dinophyceae**
6	*Fragillaria sp.*	1	*Ceratium*sp.
7	*Melosira granulata*		**Xanthophyceae**
8	*Navicula grimmii*	1	*Tribonema*sp.
9	*Nitzschia* sp.		
Source: GRC Survey Data			

Table xi: - Aquatic vegetation in the study zone

Sl. No.	Name of the Taxa	Sl. No.	Name of the Taxa
1	*Azolla pinnata*	10	*Ludwigia repens*
2	*Ceratophyllum demersum*	11	*Ludwigia* sp.
3	*Cyperus alopecuroides*	12	*Najas graminea*
4	*Cryptocoryne* sp.	13	*Ottelia alismoids*
5	*Eichhornia crassipes*	14	*Phragmites australis*
6	*Hydrilla verticillata*	15	*Potamogeton nodosus*
7	*Ipomoea aquatica*	16	*Spirodela polyrhiza*
8	*Ipomea obscura*	17	*Typha angustata*
9	*Lemna minor*		
Source :GRC Survey Data			

Wild life and avifauna of the study area:

Buffer zone of project area comprises of Aasan Conservation Reserve, and supports healthy aquatic bird population.

There are many river channels present in the buffer zone of study area which are the major attraction sites for avifauna. Aasan barrage is famous for winter migratory birds, almost 140 bird species were identified during the

field work, majority of these are migratory aquatic birds. As far as the reptile community was concerned, rat snake and house lizard are reported from the study area. But area does not support any significant wild mammalian species.

A list of wild fauna of the study area has been prepared on the basis of local inquiry from the village people and from the available published literatures. The conservation value at regional level of identified fauna was gathered from the Wildlife protection Act, 1972 moreover, global conservation status of species was estimated from Red data book of IUCN was used. No established habitats of any mammals or birds are noticed in river bed and along the banks.

The fauna of study area can be grouped in to aquatic and terrestrial as the core area mostly comprises of aquatic fauna and the buffer area provides shelter to the terrestrial animals.

Visit to Aasan Conservation Reserve

Aquatic fauna:

Aquatic fauna mostly comprises of Avifauna, Amphibians & Fish which cannot survive without water. Detail list of aquatic birds is shown in tabular form.

Zooplankton

Zooplankton is commonly found in all types of aquatic habitats. These are recognized as secondary producer sand considered as one of the best tools for environmental monitoring programme. During the present survey zooplankton diversity of different habitats was assessed. List of zooplankton species recorded from water bodies present in the buffer zone is given in the tables below:

Table: - xii Zooplankton Species in the study zone

Name of the Groups	Name of the Taxa
Protozoa	*Arcella* sp.
	Centropyxis sp.
	Difflugia sp.
	Paramoecium sp.
Rotifera	*Asplanchna brightwelli*
	Brachionus angularis
	Brachionus calciflorus
	Brachionus falcatus
	Brachionus sp.
	Cephlodella gibba
	Filinia longiseta
	Keratella cochlearis
	Keratella tropica
	Lecane closterocera
	Lecane luna
Copepoda	*Cyclops* sp.
	Mesocyclops sp.
	Thermocylops sp.
	Diaptomus sp.
	Nauplius larvae
Cladocera	*Alona intermediate*
	Bosmina sp.
	Bosmina longirostris
	Chydorus sp.
	Daphnia sp.
	Daphnia pulex
	Diaphanosoma excisum
Ostracoda	*Cypris* sp.
	Stenocypris sp.
Source: GRC Survey Data	

Macro-invertebrates

Macro-invertebrates are commonly found in all types of aquatic habitats such as streams, rivers, wetlands, lakes and ponds. The term macro-invertebrate used for those animals that have no backbone and can be seen with the naked eye. These animals generally include insects, crustaceans, molluscs and annelids. They are significant within the food chain as larger animals such as fish and birds rely on them as a food source. Various macro-invertebrate species were collected and identified from different habitats present in the buffer zone of present mining project is tabulated below:

Table:- Xiii Macro-invertebrates Species Recorded in study zone

Name of the Groups	Name of the Taxa
Mollusca	*Corbicula* sp.
	Corbicula striata
	*Gyraulus*sp.
	Lamellidens sp.
	Melanoides scabra
	Thira tuberculata
Diptera	*Chironomus* sp.
	Chironomus plumosus
	Tendipes kiefferulus
Oligochaete	*Dero dagitata*
	Pheretima sp.
	Tubifex tubifex
Crustacea	*Gammarus pulex*
	Palemone sp.
Trichoptera	*Glossosoma* sp.
	Hydropsyche sp.
Ephemeroptera	*Baetis nymph*
	Caenis runlorum
Source: GRC Survey Data	

Fish Fauna

The fish species which are commonly found in nearby the aquatic habitats of the proposed site are listed in the table mentioned below:

Table:- Xiv The fish species in nearby the aquatic habitats

Family	Scientific Name	IUCN status
Order- Beloniformes		
Family: Belonidae	*Xenentodon cancila*	LC
Order- Cyprinidontiforms		
Family: Aplocheilidae	*Aplocheilus panchax*	LC
Family: Cyprinidae	*Amblypharyngodon mola*	LC
	Puntius conchonius	VU
	Labeo calbasu	LC
	Labeo dero	LC
	Labeo bata	LC
	Labeo dyocheilus	LC
Order- Clupeiformes		
Family: Clupeidae	*Gudusia chapra*	LC
Order- Perciformes		
Family: Nandidae	*Nandus nandus*	LC
Order- Siluriformes		
Family: Pangasidae	*Pungasius pungasius*	LC
Family: Sisoridae	*Bagarius bagarius*	VU
Family: Siluridae	*Heteropneustes fossilis*	LC
Family: Mastacembelidae	*Macrognathus pancalus*	NT
Order- Tetraodontiformes		
Family: Tetraodontidae	*Tetraodon fluviatilis*	NE
IUCN Status=LC: Least Concern**, NE:** Not Evaluated**, EN:** Endangered**, NT:** Near Threatened.		

Terrestrial fauna:

Mammals: Area is not rich in wild mammal population due high anthropogenic pressure. There is continuous series of human settlements from Dehradun city to project site which restricted any significant wildlife in area. However, at around 18 km from project site there are areas with high wildlife biodiversity, such as Rajaji National Park and Mussoorie Wildlife Sanctuary. Common grazing livestock 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), fruits bat (*Pteropus conspicillatus*), Nilgai (*Boselaphus tragocamelus*), etc. are often seen in the area. Nilgai has become a menace to the farmers in the district due to their rising numbers and damage to agriculture crops.

Avifauna: Terrestrial birds like Red-vented Bulbul, Magpie Robin, Jungle Babblers, White Wagtail, House Sparrow, House Crow, Babbler, Warblers and Tits can be easily observed in study area.

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

Amphibians:

Amphibians are commonly at the places along the margin of aquatic and terrestrial systems. Due to presence of several water bodies like river and streams etc. the study area is providing shelter to many amphibian species. During the present survey period, some amphibian species commonly observed in the buffer zone of the project are given below:

Table (XV): - Amphibian Species found in different Aquatic Habitats of Buffer zone of present mining Area

Sl. No.	Common name	Scientific name	Schedule / WPA,1972	IUCN Status
Toad/Frog				
1	Common Indian toad	*Duttaphrynus melanostictus*	IV	NA
2	Indian skipper frog	*Euphlyctis cyanophlyctis*	IV	NA
3	Indian bull frog	*Hoplobatrachus tigerinus*	IV	NA
Source:GRC Survey Data supported by Department of Forest, Uttarakhand				

A list of Fauna of the study area is given below.

A list of Fauna of the study area is presented in Table 3.1(xvi).

Table 3.3(xvi): Fauna of the Core zone

S. No.	Common Name	Scientific Name	Wildlife schedule	IUCN Red List Status
AVIFAUNA				
1	Common Myna	*Acridotheres tristis*	IV	LC
2	House Crow	*Corvus splendens*	V	LC
3	Ashy Drongo	*Dicrurus leucophaeus*	IV	LC
4	Koel	*Eudynamys scolopacea*	IV	NA
5	Sparrow	*Passer domesticus*	IV	LC
MAMMALS				
1	Squirrel	*Funambulus pennant*	IV	DD
2	Rat	*Rattus rattus*	V	LC
AMPHIBIANS				
1	Common Indian toad	*Duttaphrynus melanostictus*	IV	NA
2	Indian skipper frog	*Euphlyctis cyanophlyctis*	IV	NA
3	Indian bull frog	*Hoplobatrachus tigerinus*	IV	NA

LC: Least Concern, VU: Vulnerable, NA: Not Assessed, DD: Data deficient.

Table 3.3 (xvii) Fauna of the Buffer zone

S.No.	Common Name	Scientific name	IWPA	IUCN
MAMMALS				
1	Squirrel	*Funambulus pennant*	IV	DD
2	Rat	*Rattus rattus*	V	LC
3	Wild pig	*Sus scrofa*	III	LC
4	Goral	*Naemorhedus goral*	III	LC
5	Nilgai	*Boselaphus tragocamelus*	III	LC
6	Spotted Deer	*Axis axis*	II	LC
7	Rhesus Macaque	*Macaca mulatta*	II	LC
8	Indian Grey Mongoose	*Herpestes edwardsii*	IV	LC
REPTILES & AMPHIBIANS				
1	Common Toad	*Duttaphrynus melanostictus*	IV	NA

S.No.	Common Name	Scientific name	IWPA	IUCN
2	India bull frog	*Rana tigrina*	IV	DD
3	Indian tree frog	*Polypedates maculatus*	IV	NA
4	Skipping frog	*Bufo stomaticus*	IV	NA
5	Garden lizard	*Calotes versicolor*		NA
6	House lizard	*Hemidactylus sp*	IV	NA
7	Rat snakes	*Ptyas mucosa*	II	NA
AVIFAUNA				
S.No.	**Common Name**	**Scientific name**	**IWPA**	**IUCN**
1.	Jungle Myna	*Acridotheres fuscus*	IV	LC
2.	Bank Myna	*Acridotheres ginginianus*	IV	LC
3.	Common Myna	*Acridotheres tristis*	IV	LC
4.	Crimson Sunbird	*Aethopyga siparaja*	IV	LC
5.	Common Kingfisher	*Alcedo atthis*	IV	LC
6.	Red Avadavat	*Amandava amandava*	IV	LC
7.	Darter	*Anhinga melanogaster*	IV	LC
8.	Rosy Pipit	*Anthus roseatus*	IV	LC
9.	Water Pipit	*Anthus spinoletta*	IV	LC
10.	Tree Pipit	*Anthus trivialis*	IV	LC
11.	House Swift	*Apus affinis*	IV	LC
12.	Common Swift	*Apus apus*	IV	LC
13.	Spotted Owlet	*Athene brama*	IV	LC
14.	Cattle Egret	*Bubulcus ibis*	IV	LC
15.	Yellow-breasted Greenfinch	*Carduelis spinoides*	IV	LC
16.	Common Rosefinch	*Carpodacus erythrinus*	IV	LC
17.	Greater Coucal	*Centropus sinensis*	IV	LC
18.	Pied Kingfisher	*Ceryle rudis*	IV	LC
19.	Rock pigeon	*Columba livia*	IV	LC
20.	Oriental Magpie Robin	*Copsychus saularis*	IV	LC
21.	House Crow	*Corvus splendens*	IV	LC
22.	Northern House Martin	*Delichon urbica*	IV	LC
23.	Rufous Treepie	*Dendrocitta vagabunda*	IV	LC
24.	Yellow-crowned Woodpecker	*Dendrocopos mahrattensis*	IV	LC
25.	Ashy Drongo	*Dicrurus leucophaeus*	IV	LC
26.	Black Drongo	*Dicrurus macrocercus*	IV	LC
27.	Little Egret	*Egretta garzetta*	IV	LC
28.	Asian Koel	*Eudynamys scolopacea*	IV	LC

S.No.	Common Name	Scientific name	IWPA	IUCN
29.	Verditer Flycatcher	*Eumyias thalassina*	IV	LC
30.	Jungle Owlet	*Glaucidium radiatum*	IV	LC
31.	White-throated Kingfisher	*Halcyon smyrnensis*	IV	LC
32.	Red-rumped Swallow	*Hirundo daurica*	IV	LC
33.	Streak-throated Swallow	*Hirundo fluvicola*	IV	LC
34.	Scaly-breasted Munia	*Lonchura punctulata*	IV	LC
35.	Crested Kingfisher	*Megaceryle lugubris*	IV	LC
36.	Coppersmith Barbet	*Megalaima haemacephala*	IV	LC
37.	Lineated Barbet	*Megalaima lineata*	IV	LC
38.	Brown-headed Barbet	*Megalaima zeylanica*	IV	LC
39.	Crested Bunting	*Melophus lathami*	IV	LC
40.	Green Bee-eater	*Merops orientalis*	IV	LC
41.	Blue-tailed Bee-eater	*Merops philippinus*	IV	LC
42.	Blue-capped Rock Thrush	*Monticola cinclorhynchus*	IV	LC
43.	Blue Rock Thrush	*Monticola solitarius*	IV	LC
44.	Purple Sunbird	*Nectarinia asiatica*	IV	LC
45.	House Sparrow	*Passer domesticus*	IV	LC
46.	Scarlet Minivet	*Pericrocotus flammeus*	IV	LC
47.	Tickell's Leaf Warbler	*Phylloscopus affinis*	IV	LC
48.	Lemon-rumped Warbler	*Phylloscopus chloronotus*	IV	LC
49.	Greenish Warbler	*Phylloscopus trochiloides*	IV	LC
50.	Grey-headed Woodpecker	*Picus canus*	IV	LC
51.	Plain Prinia	*Prinia inornata*	IV	LC
52.	Rose-ringed Parakeet	*Psittacula krameri*	IV	LC
53.	Red-vented Bulbul	*Pycnonotus cafer*	IV	LC
54.	Himalayan Bulbul	*Pycnonotus leucogenys*	IV	LC
55.	Plain Martin	*Riparia paludicola*	IV	LC
56.	Sand Martin	*Riparia riparia*	IV	LC
57.	Grey Bushchat	*Saxicola ferrea*	IV	LC
58.	Common Stonechat	*Saxicola torquata*	IV	LC
59.	Spotted Dove	*Streptopelia chinensis*	IV	LC
60.	Asian Pied Starling	*Sturnus contra*	IV	LC
61.	Brahminy Starling	*Sturnus pagodarum*	IV	LC
62.	Common Wood shrike	*Tephrodornis*	IV	LC

S.No.	Common Name	Scientific name	IWPA	IUCN
		pondicerianus		
63.	Asian Paradise-flycatcher	*Terpsiphone paradisi*	IV	LC
64.	Common Babbler	*Turdoides caudatus*	IV	LC
65.	Jungle Babbler	*Turdoides striatus*	IV	LC
66.	Common Hoopoe	*Upupa epops*	IV	LC
67.	River Lapwing	*Vanellus duvaucelii*	IV	LC
68.	Oriental White-eye	*Zosterops palpebrosus*	IV	LC

LC: Least Concern, NA: Not Assessed, DD: Data deficient.

3.1.7 SOCIO ECONOMIC & ITS BASELINE DATA:

The socio economic and its baseline data has been collected to comprehend socio-economic status of the people living in the study area and also to assess the impact of the project on it.

METHODOLOGY

For Socio-Economic Impact assessment of the proposed Sand, Bajri & Boulder mining project on River Asan, Lot No. 14/6, Villages Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil VIikasnagar, District Dehradun, Uttarakhand systematic analysis of various Socio-Economic characteristics, both in terms of quality and quantity has been done. Accordingly, both qualitative and quantitative data was collected from secondary sources. For collection of secondary data GRC approached the Census Authority in the state for published data/information, visited state and district portal and referred to administrative records of the state and district administration. The qualitative data deals with description; they can be observed but not measured. Hence, codes were extensively used during collection of qualitative data. They were decoded after data processing to facilitate data analysis and report writing.

STUDY AREA

The study area consists of lease area and buffer area. There is no vegetation in the leased out area excepting few small bushes. There are 58 villages and

two towns in the study area. All the habitations are located in Uttarakhand. There is no habitation in the part falling Uttar Pradesh. The district and sub-district wise distribution of villages is presented in the table below:

Table 3.4: Sub-district wise distribution of villages and towns in the Study Area

S. No.	Name of the Sub-district	Number of Villages	Number of Towns
District: Dehradun, Uttrakhand			
1	Dehradun	7	2
3	Vikasnagar	51	-
Total		**58**	**2**

About 58 percent of the study area is covered with dense forest. Cultivation is under taken in about 27 percent of the total area of the study area. The entire mining lease area is part of river bed and there is is very few vegetation, like shrubs, grasses etc. In the study area Kharif is the main agricultural season. Important crops grown are paddy, wheat, maize, joi, jowar, bazra, mudwa, sawa, kodo, urad, massur, chana, arhar, sarso, till, mungfali, soyabeen, sugarcan, potato etc. Vegetables are grown in abundance. Important minerals found in the area are Sand, Bajri & Boulders. These are minor minerals. The area is rich in water resources which are used for hydro-electricity generated. There are Engineering, Chemicals, Handlooms and Handicrafts industries in the study area.

BASELINE DATA

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

Table 3.5:- Demographic Particulars of the Study Area

S.N.	Description	Number	% to Respective Total
1	**Gender wise Total Population of the Study Area**	**743164**	**100**
	Male	391695	52.7

	Female	351469	47.3
	Sex Ratio (No. of females per 1000 males)	897	
2	**Gender wise Total Population (0-6 age group)**	**82738**	**100**
	Male	43937	53.1
	Female	38801	46.9
	Sex Ratio of 0-6 age group population (No. of females per 1000 males)	883	
3	**Total Number of Households**	**158977**	
	Average Household size for the study area as a whole	5	
	Highest Household size in the study area	11	
	Lowest Household size in the study area	4	
4	**Total Population of Schedule Caste Community in the Study Area**	**87798**	**100**
	Male	46184	52.6
	Female	41614	47.4
	Sex Ratio (No. of females per 1000 males)	901	
5	**Total Population of Schedule Tribe Community**	**16177**	**100**
	Male	8631	53.4
	Female	7546	46.6
	Sex Ratio (No. of females per 1000 males	874	
6	**Total Population of General Community (including OBC)**	**639189**	**100**
	Male	336880	52.7
	Female	302309	47.3
	Sex Ratio of General Community population (including OBC) (No. of females per 1000 males	897	
7	**Total Literates in the Study Area**	**571410**	**100**
	Male	314388	55.0
	Female	257022	45.0
	Overall Literacy Rate in the Study Area	**86.5**	
	Male	90.4	
	Female	82.2	
	Gender Gap in Literacy Rate	8.2	
8	**Total Workers in the Study Area**	**251302**	**100**
	Male	204087	81.2
	Female	47215	18.8
	Overall Gender Gap in Work Participation Rate	62.4	
9	**Total Main Workers in the Study Area**	**219835**	**100**
	Male	183204	83.3
	Female	36631	16.7
	Overall gender gap in work participation rate of main workers	66.6	
10	**Total Marginal Workers in the Study Area**	**31467**	**100**
	Male	20883	66.4
	Female	10584	33.6

	Overall gender gap in work participation rate of Marginal workers	32.8	
11	**Total Household Industrial Workers in the Study Area**	**10450**	**100**
	Male	8000	76.6
	Female	2450	23.4
12	**Total Agricultural Workers in the Study Area**	**18090**	**100**
	Male	14103	78.0
	Female	3987	22.0
13	**Total Cultivators in the Study Area**	**6984**	**100**
	Male	5064	72.5
	Female	1920	27.5
14	**Total Agricultural Labour in the Study Area**	**11106**	**100**
	Male	9039	81.4
	Female	2067	18.6
15	**Total 'Other Workers' in the Study Area**	**222762**	**100**
	Male	181984	81.7
	Female	40778	18.3

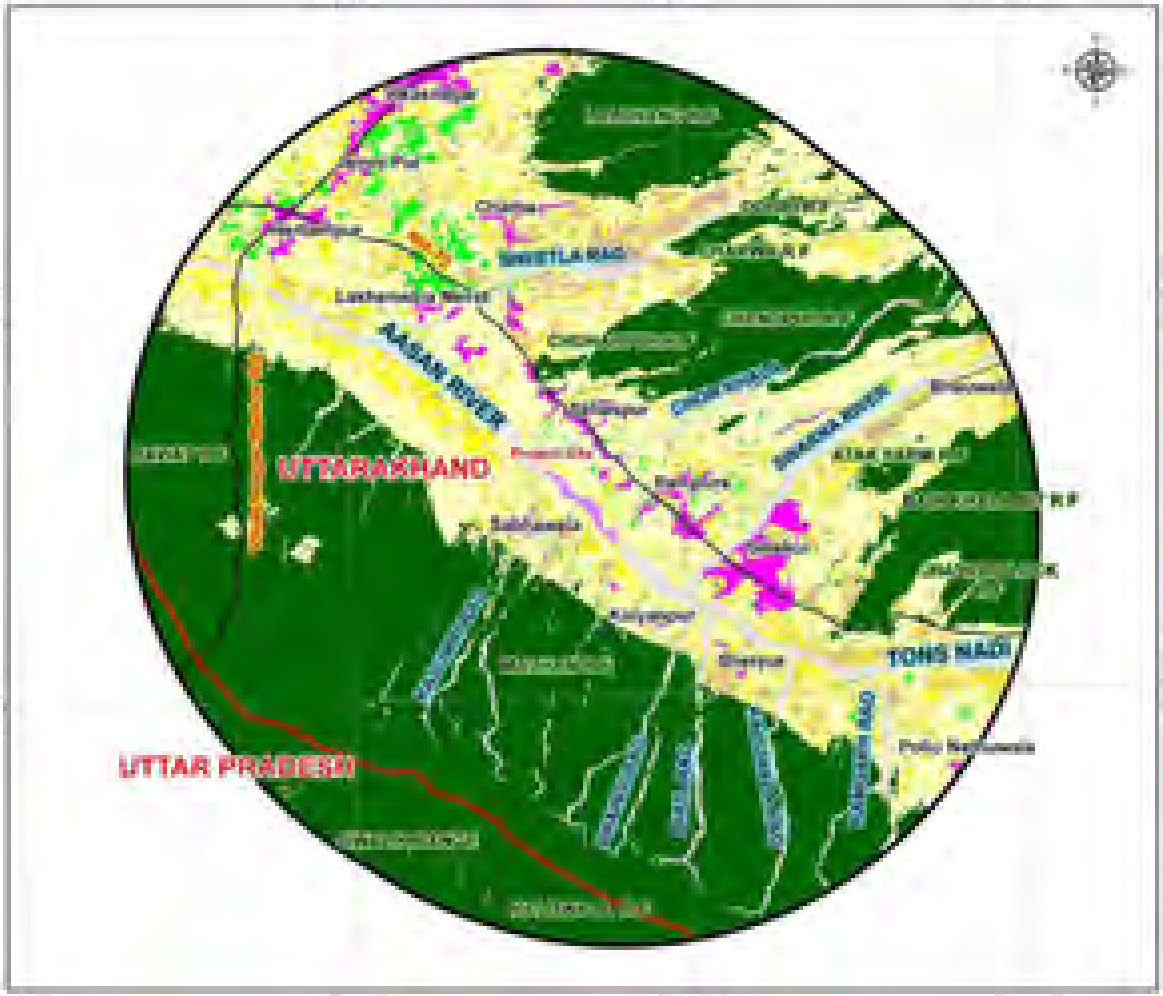
Source: Census 2011

Table 3.6 Various Amenities Available in the Study Area

S. No	Amenities	Type	No. of Villages	Number of Facilities	No. of Towns	Number of facilities
1	Educational Institutions	Primary School	49	79	-	-
		Middle School	29	34	-	-
		Secondary School	12	13	-	-
		Senior Secondary School	4	5	-	-
		Adult Literacy Center	22	37	1	3
		Other School	12	23	-	-
		Art College	-	-	1	4
		Science College	-	-	1	4
		Commerce College	-	-	1	4
2	Health Facilities	Allopathic Hospital	7	7	2	12
		Homeopathic Hospital	1	1	-	-
		Allopathic Dispensary	9	9	2	23
		Ayurvadic Dispensary	3	3	-	-
		Homeopathic Dispensary	3	3	-	-
		Maternity & Child Welfare Center	17	17	-	-
		Maternity Home	4	4	-	-

		Primary Health Centre	6	6	-	-
		Primary Health Sub-Centre	10	10	-	-
		Health Centre	2	2	-	-
		Child Welfare Center	8	8	-	-
		Family Welfare Centre	4	4	-	-
		TB Clinic	1	1	1	1
		Registered Medical Practicenors	14	31		
		Subsidized Medical Practicenors	1	1	-	-
		Community Health Workers	32	33	-	-
3	Drinking Water	Well	21	-	-	-
		Hand Pump	32	-	2	-
		Tub well	17	-	2	-
		Tap	57	-	2	-
4	Electricity	Power for Domestic Uses	27	-	2	-
		Power for Agriculture Uses	6	-	-	-
		All Purposes	20	-	-	-
5	Approach Road	Only Paved Roads	13	-	2	-
		Only Mud Roads	5	-	-	-
		Paved, Mud & Footpath Roads	14	-	-	-
7	Banks & Credit Societies	Commercial Bank	8	-	2	-
		Cooperative Bank	5	-	-	-
		Agriculture Credit Society	5	-	-	-
8	Communication Facilities	Bus Services	34	-	2	-

The impact assessment based on this data collected has been discussed in Chapter VI



Legend

Project Site

Buffer Boundary

State Boundary

Road

River With Dry Channel

Settlement

Open Land

Vegetation

Forest

Agricultural Land

Agricultural Fallow Land

AASAN (144) Mining Project, Dist: Dehradun, Uttarakhand

Landuse/Landcover Map Of the Study Area

AASAN (14/6) Mining Project,
Distt: Dehradun, Uttarakhand

Monitoring Wise for Ambient Air Quality, Noise Monitoring, Soil Sampling, Ground Water & Surface Water Sampling

CHAPTER-IV

ANTICIPATED ENVIRONMENTAL IMPACT AND MITIGATION MEASURES

INDEX

4.0 GENERAL

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

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

4.1 LAND ENVIRONMENT

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

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

Anticipated Impacts:

- Undercutting and collapse of river banks.
- River bank cutting and erosion.

- Upstream erosion as a result of an increase in channel slope and changes in flow velocity.
- Downstream erosion due to increased carrying capacity of the stream
- Downstream changes in patterns of deposition.
- Changes in channel bed and habitat type.

Mitigation measures:

- Since the project is mainly for sand, *bajri* and boulder excavation (soil deficient), no loss of top soil is involved.
- The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere.
- Mine lease area has been proposed leaving a safety distance of 15% of the width of the river from the bank inwards which will protect 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.
- Grasses and bushes which have fibrous roots at the first instance are proposed to grown along the banks which enhances the binding properties of the soil. Hence protecting the banks.
- The systematic and scientific removal of sand, *bajri* and boulder will not cause bed degradation.
- Restoration of bank will be ensured at the end of mine closure every year.

4.2 WATER ENVIRONMENT

Anticipated Impacts:

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

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

i. alteration of flow patterns resulting from modification of the river bed
ii. an excess of suspended sediment
iii. Damage to riparian vegetation and in-stream habitat

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

Mitigation measures

Project activity will be carried out only in the dry part of the river bed. Hence, none of the project activities affect the water environment directly. No proposal is envisaged for pumping of water either from the river or tapping the ground water.

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

The deposit will be worked from the top surface up to a maximum depth of 1.5m 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.

4.3 AIR ENVIRONMENT

Anticipated Impacts:

Emission of fugitive dust is envisaged due to:

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

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

iii. Air Modeling

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

FUGITIVE DUST- MODELING

Air quality modeling was done using line source model as published by USEPA "Emission Factor Documentation for AP-42", in section 13.2.2, for transportation though unpaved roads. Emission factors to be used in Line source dispersion equation is adopted from formula as given below:

$E=k * (s/12)^a * (W/3)^b /(M/0.2^c)$ .....(1)

Where

E = Emission Rate (lb/VMT)

s = Surface material Silt Content (%) = 10%

W=Mean Vehicle Weight (tonnes) = 10 tonnes

M= Surface material moisture content (%) = 2.5%

K, a, b & c are empirical constants with values given as below:

Constant	PM 10
k	2.6
a	0.8
b	0.4
c	0.3

Thus for vehicles of 10 tonners, the Emission Rate using equation **(1)** is**:**

E = 1.06873 lb/VMT

E = 0.001172 g/s/m

Concentration of the fugitive dust was calculated using the formula given in "Workbook of Dispersion Modeling" by Turner. The Concentration of the fugitive Dust is given below:

$C = (2/\pi)^{1/2} \; (E / \sigma z \, u) \, Exp- [(h^2) / (2 \, \sigma z^2)] \times 10^6$ ---------- (2)

Where

C = Hourly Concentration in microgram/ m^3

E = Emission Rate = 0.001172 g/s/m

υ = Wind Speed = 2.1 m/s

h = 0 m

Modeling was done for an infinite line source assuming unpaved road. For conservative calculation wind was assumed to blow at a velocity of 2.1 m/s perpendicular to the road. The results for 24 hourly concentration values are given in the Fig. 4.1:

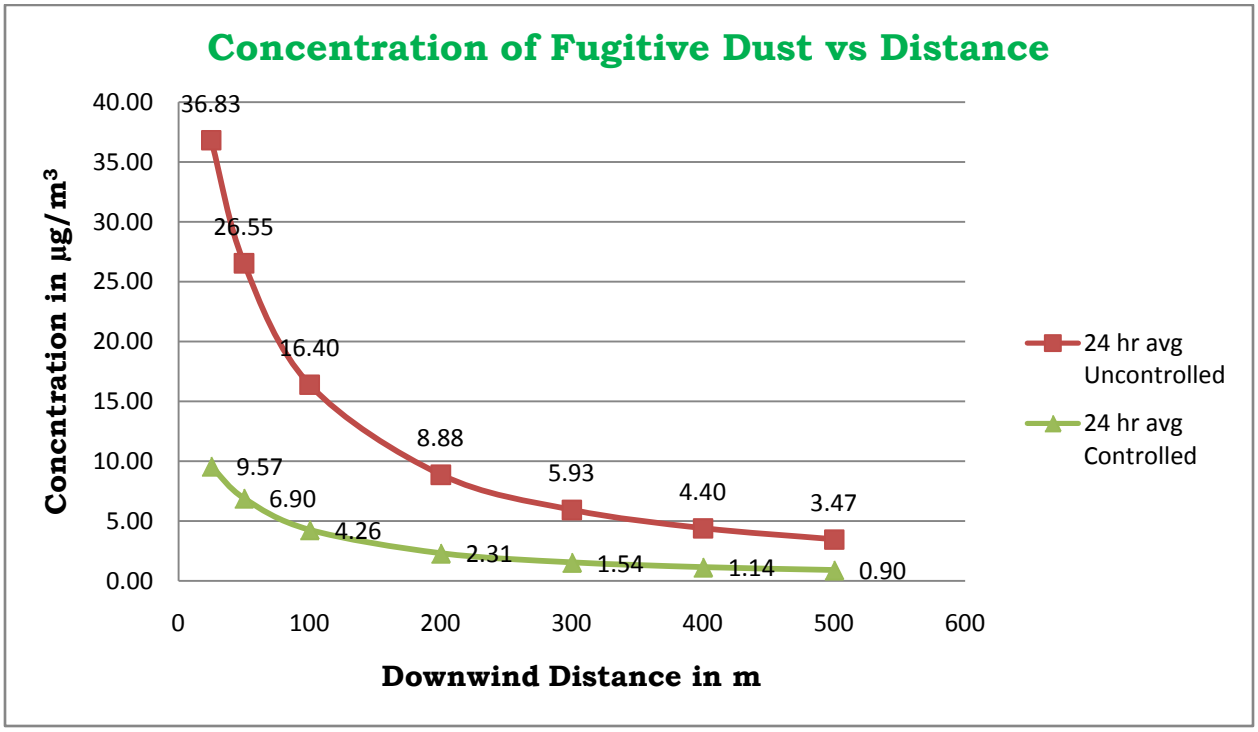


Fig.4.1 Graph showing Concentration of Fugitive dust vs Distance in 24 hr average unscientific and scientific way

It is observed that the ground level concentration (GLC) decreases from **36.83 µg/m³** at **25 m** to **3.47 µg/m³** at **500 m** from the centre line of the road. These values have been predicted for a dry unpaved road in an uncontrolled scenario. However, the GLC at **25 m** will further reduce down to **9.57µg/m³** and **0.90 µg/m³** at **500 m** in a controlled scenario i.e. through water sprinkling.

Mitigation measures

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

- Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74% (*Ref. Haul road dust control by WR REED & JA Organiscak*).

- Speed limits (i.e. 20 km/hour) will be enforced to reduce airborne fugitive dust from vehicular traffic.
- Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
- Deploying PUC certified vehicles to reduce their emissions.
- Proper tuning of vehicles to keep the gas emissions under check.
- Monitoring to ensure compliance with emission limits would be carried out during operation.

4.4 NOISE

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

Anticipated Impacts:

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

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

Damage Risk Criteria for Hearing Loss OSHA Regulations

Maximum allowable duration per day in hour	Sound pressure dB(A)	Remarks
(1)	(2)	(3)
8.0	90	1. For any period of exposure falling in between any figure and lower figure as indicated in column (1), the permissible sound is to be determined by extrapolation or proportionate scale. 2. No exposure in excess of 115 dB(A) is permissible.
6.0	92	
4.0	95	
3.0	97	
2.0	100	
1 ½	102	
1	105	
¾	107	
½	110	
¼	115	

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

a. Mitigation measures

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

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

4.5 BIOLOGICAL ENVIRONMENT

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

Sand mining generates additional traffic, which negatively impairs the environment.

Anticipated Impacts:

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

Mitigation measures

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

1. No mining will be carried out during the monsoon season to minimize impact on aquatic life which is mainly breeding season for many of the species.
2. As the mining site has no vegetation, no clearance of vegetation will be done.
3. Prior to closure of mining operations the ramps shall be removed to protect the embankment from collapsing.
4. Haul roads will be sprinkled with water which would reduce the dust emission, thus avoiding damage to the crops.
5. Mining will be carried out on the dry part of the lease area to avoid disturbance to the aquatic habitat and movement of fish species.
6. No discard of food, polythene waste etc will be allowed in the lease area which would distract/attract the wildlife.
7. No night time mining will be allowed which may catch the attention of wild life.
8. If wildlife are noticed crossing the area, they will not be disturbed at all.
9. Workers will be made aware of the importance of the wildlife and signage will be displayed at the sensitive areas to caution the workers & other passerby.
10. Access roads will not encroach into the riparian zones and if any riparian vegetation cleared off for the mining activity will be restored at the end of closure of mine.

4.6 TRAFFIC ANALYSIS

Transportation Route:

The sand, *bajri* & boulder excavated from the lease area will be loaded directly into trucks and transported to the concerned market.

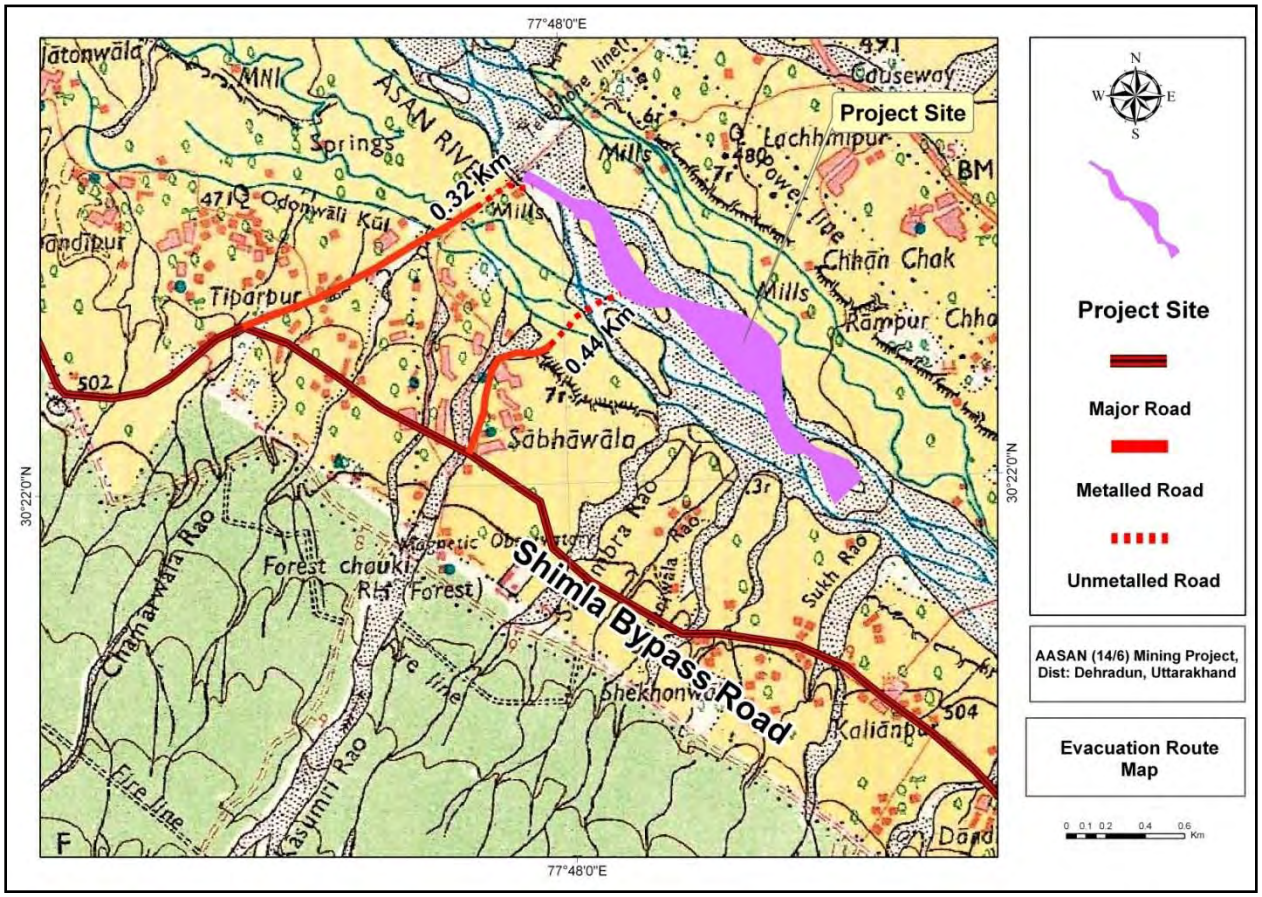
For the transportation of minerals two evacuation routes has been proposed, distributing the traffic load to reduce the traffic congestion.

Evacuation route 1: The lease area is connected to Shimla bypass Road by an unmetalled road of about 320 m and then by a metalled near village Tiparpur.

Evacuation route 2:

The lease area is connected to Shimla bypass Road by an unmetalled road of 440 m and then by a metalled road via village Sabhawala.

Evacuation route is shown in the map as given below:



Map Showing Evacuation Route

Traffic analysis is carried out by understanding the existing carrying capacity of the roads near to the project site and the connecting main roads in the area. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity.

Table 4.4 (i): Existing Traffic Scenario & LOS

Road	V	C	Existing V/C Ratio	LOS
Near village Sabhawala	120	2,000	0.06	A
Near village Tiparpur	140	2,000	0.07	A
Shimla Bypass Road	1,200	10,000	0.12	A

Source: Capacity as per IRC: 64-1990

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

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

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

Reference: ENVIS Technical Report, IISc, Bangalore.

During Mine operation

Proposed Capacity of mine/annum : 2,50,000 TPA

No. of working days : 225 days

Proposed Capacity of mine/day : 1111 TPD

Truck Capacity : 10 tonnes

No. of trucks deployed/day : 111

Increase in PCU/ day : 333

Considering both loaded & empty trucks

Increase in PCU/day will be 666 PCUs

Of the entire traffic load, the load has been distributed via two different evacuation routes via village Lachhmipur & Rampur chhota equally.

Table 4.4 (ii): Modified Traffic Scenario & LOS

Road	V	C	Modified V/C Ratio	LOS
Near village Sabhawala	453	2,000	0.22	B
Near village Tiparpur	473	2,000	0.23	B
Shimla Bypass Road	1,866	12,000	0.15	A

Source: Capacity as per IRC: 64-1990

Results

From the traffic study it is observed that the level of services will go down from "A" that is Excellent to "B" that is Very Good due to additional traffic load.

Therefore, the additional load on the carrying capacity of the concerned roads is likely to have some affects, for which traffic management have been proposed and given below.

Traffic Management:

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

****

CHAPTER-V

ENVIRONMENTAL MONITORING PROGRAMME

INDEX

5.0 INTRODUCTION

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

Environmental Monitoring Program will be implemented once the project activity commences. Environmental monitoring program includes (i) environmental surveillance, (ii) analysis & interpretation of data, (iii) preparation of reports to support environmental management system and (iv) organizational set up responsible for the implementation of the programme.

5.1 ENVIRONMENTAL MONITORING AND REPORTING PROCEDURE

Monitoring shall confirm that commitments are being met. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The preventive approach to environment management may also require monitoring of process inputs, for example, type and method used, resource consumption, equipment and pollution control performance etc.

The key aims of environment monitoring are:

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

5.2 MONITORING METHODOLOGIES AND PARAMETERS

Air Quality Monitoring

Air Quality monitoring is essential for evaluation of the effectiveness of abatement programmes and to develop appropriate control measures. Suspended Particulate Matter (SPM), Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2) will be monitored at the workplace i.e. core zone. The methodology proposed for is shown below:

Parameters	Technique	Technical Protocol
PM_{10}	Gravimetric method	**IS 5182 (Part-XXIII)**
$PM_{2.5}$	Gravimetric method	**CPCB Guideline Vol. I may 2011**
Sulphur Dioxide	Improved West and Gaeke	**IS-5182 (Part-II)**
Nitrogen Dioxide	Modified Jacob & Hochheiser	**IS-5182 (Part-VI)**

Water Quality monitoring

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

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

Soil Quality monitoring

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

Noise Level Monitoring

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

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

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

Socio-economic Survey

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

Plantation monitoring programme

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

5.3 MONITORING SCHEDULE

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

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

5.4 MONITORING SCHEDULE - IMPLEMENTATION

An implementation programme has been prepared as it serves no purpose if it is not implemented in letter and spirit.

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

a) Collection of air and water samples at strategic locations with frequency suggested and by analyzing thereof. If the parameters exceed the permissible tolerance limits, corrective regulation measure will be taken.
b) Collection of soil samples at strategic locations once every two years and analysis thereof with regard to deleterious constituents, if any.

c) Measurement of water level fluctuations in the nearby ponds, dug wells and bore wells and to assess if mining has got any impact on it or not.
d) Measurement of noise levels at mine site, stationary and mobile sources, and adjacent villages will be done twice a year for first two years and thereafter once a year.
e) Post plantation, the area will be regularly monitored in every season for evaluation of success rate. For selection of plant species local people should also be involved.

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

5.5 BUDGET ALLOCATION FOR MONITORING

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

S. No.	Description	Cost to be incurred (in lakhs/annum)
1	Air Quality	0.5
2	Water Quality (Surface & Groundwater)	0.5
3	Soil Quality	0.3
4	Noise Level	0.3
5	Socio-economic Condition	0.4
6	Plantation	0.2
TOTAL		**2.2**

5.6 REPORTING SCHEDULES OF THE MONITORING DATA

It is proposed that voluntary reporting of environmental performance with reference to the EMP should be undertaken. The environmental monitoring cell shall co-ordinate all monitoring programmes at site to furnish the data

to the State regulatory agencies regularly in respect of the stipulated prior environmental clearance terms and conditions.

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

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CHAPTER-VI

ADDITIONAL STUDIES

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6.0 PUBLIC CONSULTATION

The public consultation for this project was held on 16th July, 2014. The Public hearing Notice is shown below which was published on 21-5-2014 in the regional news papers, Times of India.

The records of the proceedings are attached at Annexure XII (A) and the action plan along with budget allocation is attached as Annexure XII (B).

6.1 HAZARD IDENTIFICATION AND RISK ASSESSMENT METHODOLOGY

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

Step I: Hazard Identification

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

Step II: Risk Assessment

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

implementation of control measures.

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

Step III: Risk Control

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

Step IV: Implementation of risk controls

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

The most effective methods of control are:

i. Elimination of hazards

ii. Substitute something safer

iii. Use engineering/design controls

iv. Use administrative controls such as safe work procedures

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

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

Step V: Monitor and Review

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

A) RISK ANALYSIS

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

a) Initial Site Evaluation,

b) Detailed Site Evaluation,

c) Priority Site Investigations and Recommendations.

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

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

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

Risk analysis is done for:

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

Risk Likelihood Table for Guidance (TABLE -1)

Step 1: Assess the Likelihood				**Step 2: Assess the Consequences**		
L1	Happens every time we operate	Almost Certain	Common or repeating occurrence	**C1**	Fatality	Catastrophic
L2	Happens regularly (often)	Likely	Known to have occurred "has happened"	**C2**	Permanent disability	Major
L3	Has happened (occasionally)	Possible	Could occur or "heard of it happening"	**C3**	Medical/hospital or lost time	Moderate
L4	Happens	Unlikely	Not likely to	**C4**	First aid or no	Minor

	irregularly (almost never)		occur		lost time	
L5	Improbable (never)	Rare	Practically impossible	**C5**	No injury	Insignificant

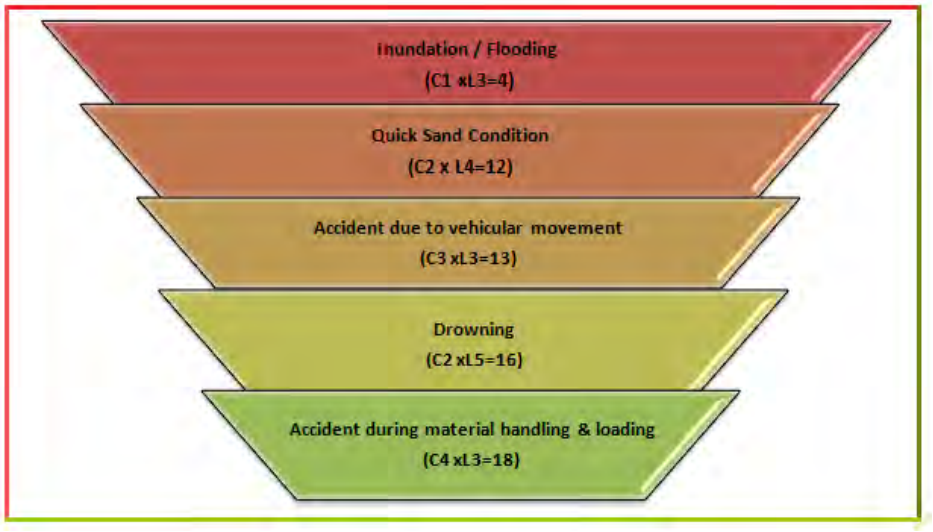
A logical systematic process is usually followed during a qualitative risk assessment to identify the key risk events and to assess the consequences of the events occurring and the likelihood of their occurrence (TABLE-2)

Risk Rank **LikelihoodxConsequence**	**L1** **Almost certain**	**L2** **Likely**	**L3** **Possible**	**L4** **Unlikely**	**L5** **Rare**
C1 **Catastrophic**	**1**	**2**	**4**	**7**	**11**
C2 **Major**	**3**	**5**	**8**	**12**	**16**
C3 **Moderate**	**6**	**9**	**13**	**17**	**20**
C4 **Minor**	**10**	**14**	**18**	**21**	**23**
C5 **Insignificant**	**15**	**19**	**22**	**24**	**25**

RISK RATING:

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

6.2 RISK ASSESSMENT



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

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

The Risk rating of such hazards is as follows:

6.2.1 INUNDATION/FLOODING

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

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

Measures to prevent consequences of Inundation/Flooding

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

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

6.2.2 Quick Sand Condition

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

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

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

Measures to Prevent Quick Sand Condition

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

6.2.3 ACCIDENT DUE TO VEHICULAR MOVEMENT

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

Measures to Prevent Accidents during Transportation

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

6.2.4 DROWNING

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

Measure to Prevent Drowning

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

6.2.5 ACCIDENT DURING MATERIAL HANDLING & LOADING

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

Measures to Prevent Accidents during material handling & loading

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

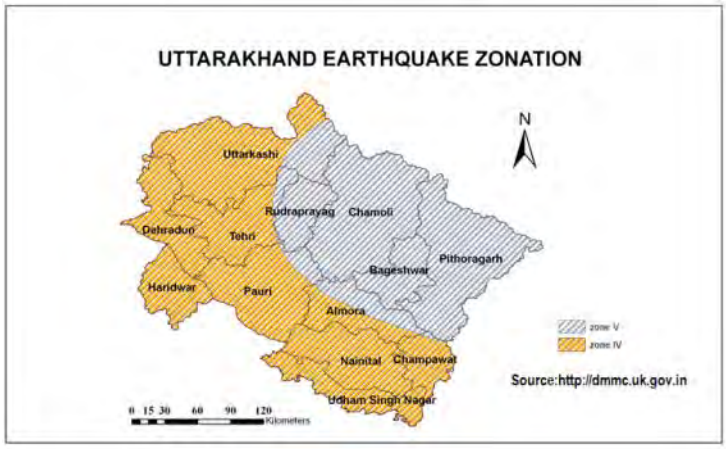
All the activities will be done under strict supervision/control to avoid anticipated accidents so that the risk is reduced to a level considered **As Low As**

Reasonably Practicable (**ALARP**) conditions which are adequately safe and healthy

6.3 DISASTERS & ITS MANAGEMENT

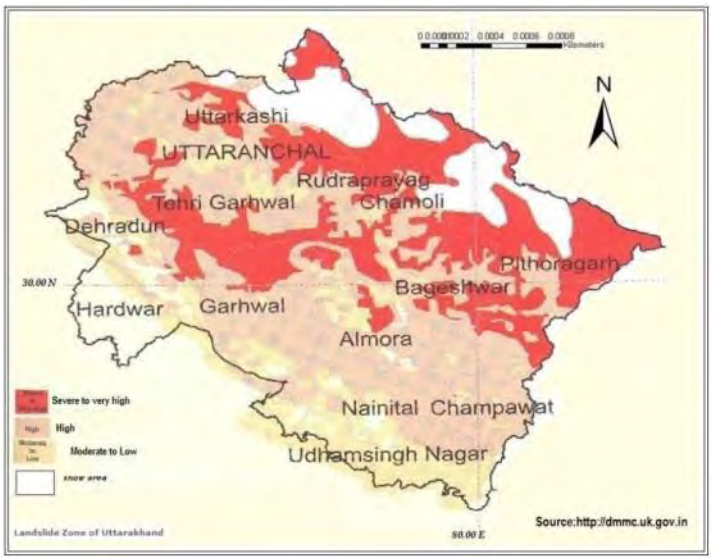
6.3.1 Anticipated Disasters

1. **Floods**: The area is not highly prone to floods but however cloudbursts may cause floods & flashflood near the proposed site. Precautionary measures will be taken and in disaster management, it will be considered to avoid the impending effects on the workers at the site if the disaster occurs.
2. **Earth Quake:** The lease area falls in seismic zone IV which is prone to earthquakes.



3. **Land slide:**

The area lies in low landslide zone as per the mapping shown here.



6.3.2 Disaster Management

At present Disaster Mitigation & Management Centre is working as autonomous institute under aegis of Department of Disaster Management Government of Uttarakhand and Disaster Mitigation and Management Centre(DMMC)is the apex center in the field of Disaster Mitigation & Management in Uttarakhand, to protection of the community and the environment from the over whelming obliteration caused by disasters. *(source: dmmc.uk.giv.in)*

- ✓ District Level Cell and State Level Cell are to take timely precautionary measures to avoid effects of impending disasters.
- ✓ The State Level Cell will be in continuous touch with State Govt. to pass on message like heavy rainfall etc. as received from IMD and take precautionary action to prevent any consequential disaster.
- ✓ A Nodal Officer at State Level Cell will be made in charge for the timely dissemination of the information & monitoring to the District Level Cells.
- ✓ "Disaster Warning System" as developed will be strictly implemented.
- ✓ Identification of nearby hospitals with route & contact number for emergency assistance.
- ✓ Evacuation plan for the workers at site including contract labours will be developed in nearby shelters.
- ✓ "Emergency Helpline Number" will be displayed at all levels.

6.4 SOCIO-ECONOMIC IMPACT OF THE PROJECT & SAFETY MEASURES

INTRODUCTION

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

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

OBJECTIVES OF SEIA

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

SCOPE

The Scope of the study is as follows:

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

SOCIO-ECONOMIC IMPACT OF THE PROJECT

Impact on Demographic Composition

The proposed *Project* will hardly make any difference in the demographic composition of the study area as the additional employment it envisages to create will be met locally to the maximum extent. Hence, the chances of in-

migration of people from outside the study area are remote. Accordingly, there will be no variation in the total population of the study area including that of sex ratio, when the mine starts operating.

Employment Opportunities

The proposed Project will provide employment to local people. The number of workers to be deployed in the mining project will depend upon the quantity of minerals to be extracted from the mine by the lease holder. Both the miners and the unskilled workers will be recruited locally. It has estimated that 196 people will get direct employment in this mining project for a period of nine months in a year. Besides the above the project is expected to generate indirect employment to the extent of 30 persons in the informal sector. It is a positive impact of the project since it is providing employment opportunities to the local people. The project will not affect the vulnerable groups of people.

Increased Supply of minerals in the Market

Sand, *Bajri & boulder* has many uses. These minerals mixed with cement and lime it is used in masonry construction. It is a critical component of concrete mixture. Both Government departments and private developers have taken up construction of roads, bridges and buildings in a big way. Hence, the demand for sand, *bajri* and boulder after crushing is ever increasing with the growth of the infrastructure development in our country. The requirement for the building materials is always high and there is already an acute shortage of sand in the market and the construction industry is the main sufferer. With the commencement of the proposed mining project the supply of minerals will increase and the gap between demand and supply will decrease to some extent, if not fully.

Impact on Agriculture

The proposed activity is to take place in the bed of the River Aasan. There will be no negative impact on agriculture as no cultivation is taking place on the proposed mining area. Since, scientific mining will be adopted in the proposed mining project the area will not face flood due to mining, which destroy standing

crops and land & property. Removal of obstruction to river flow by mining will also channelize the river away from banks and flood intensity will be reduced. This is a positive impact of the proposed mining project.

Impact on Road Development

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

Income to Government

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

Impact on Law & Order

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

Impact on Health

There are no chances of occurring diseases, due to manual mining of sand, *bajri* and boulder. Sand is non-toxic. However, sand mining activities require precautions since it create respiratory problems among mine workers. Excessive inhalation of sand is a serious health concern. To avoid respiratory problem from sand necessary protection shall be taken.

Few safety measures are outlined below:

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

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

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

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

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

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

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

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

i) **Special Telephone Number:** A special telephone number will be made available to the workers in case of emergency so that they can dial the same

for–medical assistances. Further, efforts will be made to provide vehicles to the patients in short duration for shifting to a hospital.

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

CONCLUSION

The commissioning of Sand, *Bajri* & Boulder Mining Project will provide employment to local people who are in search of the same. The granting of environment clearance to Garhwal Mandal Vikas Nigam Ltd will make mining of Sand, *Bajri* & Boulder environmentally safe, legally valid and it will generate revenue for the state. Agricultural productivity in the area can be increased if some surplus fund can be transferred to agricultural activities which is lacking in the area due to local fund generating capability of the farmers. Also there is surplus agricultural labour leading to unemployment. With the implementation of the Sand, *Bajri* & Boulder Mining Project the occupational pattern of the people in the area will change making more people engaged in mining, industrial and business activities rather in agriculture only. It is expected that mineral resources, employment & other community facilities will improve to a great extent with the opening of the Sand, Bajri & Boulder Mining Project and associated industrial and business activities.

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CHAPTER-VII
PROJECT BENEFITS
INDEX

7.0 GENERAL

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

7.1 PHYSICAL BENIFITS

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

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

7.2 SOCIAL BENEFITS

a) **Increase in Employment** Potential due to the project activity. Employment opportunities will increase both directly as well indirectly.
b) **Contribution to the Exchequer** as the saleable minerals will be given royalty. Since the quarries will be leased out to successful allottees, mining operation in the state will get legalized and it will fetch income to the state exchequer.
c) **Increased Health related activities**: Healthcare promotional activities will be undertaken. Pre-placement & and Periodic medical checkups will be done, which will lift the general health status of the residents of the area. Health camps, medical aids, family welfare programs, immunization camp sports will be arranged.

S. No.	Activities recommended for communities level services	Tentative cost (Lakh Rs)
1	Assistance to set up a temporary health center during the lease tenure.	**0.6**
2	Provide free health checkups & medicines to the nearby villagers of the project site.	**0.8**
3	Awareness campaigns regarding health issues in the nearby villages.	**0.5**
4	Health checkups & medicines to workers	**2.92**
Total		**4.82**

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

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

7.3 ENVIRONMENTAL BENEFITS

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

7.4 CORPORATE SOCIAL RESPONSIBILITY

5% (Rs. 80, 000) of the project cost will be allotted for the Corporate Social Responsibility. The following has been proposed considering the needs & demand of the people:

Education	Social Cause	Health care & Family welfare	Environment
Distribution of school bags, books and uniform to the children in nearby villages	Common vocational training centre shall be set up.	Free medical camps for the villagers	Awareness programs for the workers to sensitize them about the importance of biological environment
Free computer education to the students	Distribution of blankets to the needy people	Awareness programs will be arranged for healthcare	Distribution of free saplings to encourage villagers for plantation
Rs. 30, 000	Rs. 20, 000	Rs. 20, 000	Rs. 10, 000

In addition to this, an amount equal to 2% of the auction money will be allotted for Corporate Social Responsibility. The money will be distributed among the activities as per the need of the villagers in consultation with village sarpanch/ panchayat.

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CHAPTER-VIII

ENVIRONMENTAL MANAGEMENT PLAN

INDEX

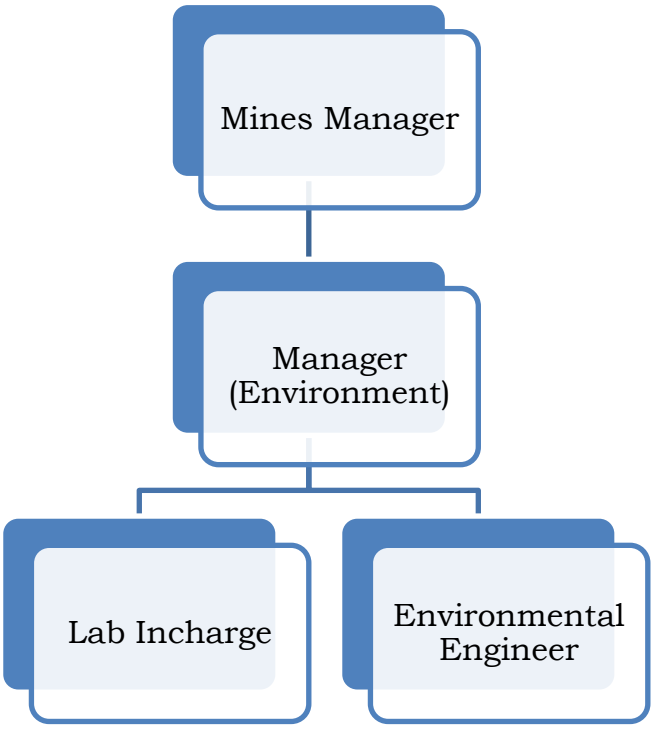
8.0 INTRODUCTION

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

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

8.1 ENVIRONMENTAL MANAGEMENT CELL (EMC)

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



The EMC will perform the following activities:

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

- Communication with the concerned department on the environmental issue.
- Monitoring the progress of implementation of environmental management programme.

8.2 ENVIRONMENTAL MANAGEMENT PLAN (EMP) AND IMPLEMEMNTATION

Environmental Management Plan involves functions that determines the objectives, adoption of appropriate mitigation measures, protection of ecosystems, enhancement of the quality of life for those affected, and minimization of environmental costs (Barrow, 1999).

Environmental Management Plan (EMP) has been formulated with an objective to mitigate the adverse impacts of any proposed project. This includes an environmental policy on protection of environment and public safety.

1. Extraction will be done from the river bed leaving safety zone from bank & stream:

- Mining will be done in scientific and systematic manner.
- Mineral will be mined out leaving sufficient safety barrier of 15 percent of width of the river for bank stability.
- A maximum of 10m from the stream will also be left to avoid interface of mining activity with surface water.

2. The maximum working depth will remain above ground water table of the area:

Excavation above the water table will be done i.e. up to a maximum depth of 1.5m from the surface, which will provide a depression that would get filled in with sediments gradually in the monsoons. Further it will not disturb the ground water quality of the area as there will be no intersection with the water table.

3. Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts:

- Provision of dust filters / mask to workers working at dust prone and affected areas.
- Conducting periodical medical checkup of all workers for occupation related health problems.
- Awareness program for workers to make them aware of way of working and various precautions to be taken while at work.

4. Ensuring wildlife protection & arranging awareness campaigns for the same.

- No wildlife will be disturbed or chased away
- To avoid disturbance to the movement of the wild animals through the transport route near the project area, sign boards will be placed detailing the dangers caused and the location of corridors.

5. Minimize activities that release fine sediment to the river:

No washing, crushing, screening, stockpiling, or plant operations will be done at or near the streams. These and similar activities have the potential to release fine sediments into the stream, making aquatic habitat conditions harmful to local aquatic species.

6. Check on traffic load due to transportation & maintenance of evacuation route:

- To the extent possible, evacuation route will not be through residential areas so as to reduce the effect of dust emission and noise pollution from vehicular movement.
- Alternate evacuation route by using the existing roads will be proposed to avoid traffic congestion.

- A Monitoring Committee including Local Panchayat member may be established to control traffic on evacuation route.

7. Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals:

- The haul road will be kept wide, leveled, compacted and water will be sprayed regularly to suppress fugitive dust.
- Evacuation routes will be repaired & maintained regularly.
- Utmost care will be taken to prevent spillage of minerals from the trucks by checking overloading and covering it by tarpaulin sheets
- It will be ensured that all transportation vehicles will carry a valid PUC certificate.

8. Establishment of reclamation program with plantation of local/native & fast growing species:

- Plantation will be done along the road sides / near civic amenities in consultation with the local authority/ Govt. bodies.
- It has also been proposed to plant along the river banks with plant species which will hold the soil and check on erosion of the banks. Eg. *Vetiveria zizanioides, Saccharum spontaneum, Pennisetum pupureum, etc.*
- For plantation purpose, native/local plant species are proposed along the road sides/civic amenities.

9. Establishment of restoration plan during the closure of mine at the onset of monsoon season:

- Restoration of banks will be done.
- Ramps & temporary rest shelters will be removed prior to the closure of mine.
- Restructuring/reconstruction of the natural bunds if damaged, so that over flow of water can be controlled and flooding can be avoided
- Maintenance of check dams & retention walls which will prevent erosion of banks during monsoon.

10. Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters:

Being a project on the river bed and though mining will not be done during monsoon, yet disaster may be caused due to earth quake, release of water from upstream dams or dam burst.

- District Level Cell and State Level Cell along with a nodal officer will be set up. The State Level Cell will be in continuous touch with State Govt. to pass on message so as to take precautionary action to prevent any consequential disaster.
- "Disaster Warning System" as developed will be strictly implemented.
- Identification of nearby hospitals with route & contact number for emergency assistance prior to the commencement of projects.
- Evacuation plan for the workers at site including contract labours will be developed in nearby shelters.
- "Emergency Helpline Number" will be displayed at all levels.

11. *Establishment of effective Monitoring Program monitored by Environment Management Cell:*

A monitoring program will be provided illustrating any impacts to river stability, riparian vegetation, ground & surface water, air, noise, soil quality and post project sedimentation studies by expert bodies. Monitoring schedule and budget allocation has been detailed Chapter-V.

The monitoring program will also assess & scrutinize the EMP proposed & its implementation by the Environmental Management Cell (EMC).

Other precautionary measures like no cooking, no uprooting or chopping of plants/trees, no throwing of wastes into the stream will also be checked upon by the EMC.

8.4 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

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

Table 8.1 Cost of EMP

Sl. No	Description	Measures	Capital Cost (Rs. In lakhs)	Recurring Cost(in lakhs/annum)
1	Health Facilities	Medical Camps and Awareness program	2.5	4.82
2	Wildlife Protection	• Importance of Wildlife(Awareness) • Sign boards, information boards	- 0.5	0.05 0.1
3	Mineral transportation and Handling	• Repairing and maintenance of Roads • Water Sprinkling	0.5 -	0.6 2.4
4	Restoration and Reclamation	• Plantation • maintenance of Check dams and Retention wall • Restoration of banks	1.0 - -	0.36 0.3 0.2
Total			**4.5**	**8.83**

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CHAPTER-IX

EXECUTIVE SUMMARY

INDEX

9.0 INTRODUCTION

As per MoEF, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as **category 'A'** project as Interstate Boundary of Uttarakhand & Uttar Pradesh and Aasan Conservation lies within the 10 km radius of the lease area and the lease area also lies in Doon Valley which is an eco-sensitive area.

The project is being proposed by Garhwal Mandal Vikas Nigam (GMVN) Limited. The proponent has applied for mining lease in the name of River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mining Project from the bed of Aasan River over an area of 32.709 ha.

It has been proposed to mine around 2.5 lakh Tonnes per annum of minerals. The estimated project cost for the proposed project is Rs.16.30 Lakhs.

The public hearing for the proposed project was done on 16th July, 2014. The details of proceedings are attached **Annexure-XII-A & B.**

9.1 LOCATION

The proposed mining lease area falls in Survey of India Toposheet 53F15 (Site).

The lease area is located in Village: Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil: Vikasnagar & District: Dehradun, Uttarakhand.

The mine lease co-ordinates are listed below:

Latitude	30°22'55.45"N to 30°22'3.32"N
Longitude	77°47'57.12"E to 77°48'58.89"E

9.2 MINING

This is an open-cast mining project. The operation will be entirely manual with use of hand tools like shovel, pan, sieves, pick axes, etc.

Mining will be done in layers, leaving a safety distance from the banks i.e. 15% of the width of river will be left for bank stability from both the banks.

The deposit will be worked from the surface of the bed upto 1.5 m bgl or above ground water level, whichever comes first. Hence, at no point of time mining will intersect with ground water table.

Mining will be done only during the day time and completely stopped during the monsoon season.

9.3 RESERVE (AVAILABLE QUANTUM) AND PRODUCTION (EXTRACTABLE QUANTUM)

The already existing quantity at the river bed in the lease area due to fresh depositions has been considered to be the quantum of mineral available (**Reserve**) which may be mined out. In order to calculate this quantity, the lease area has been considered with an ultimate depth of 1.5 meter from the surface (excluding the boulder available on the surface). For the reserve tonnage estimation, the reserve quantity is multiplied with the bulk density of 2 tonnes per cum (for mixed sand and *bajri*).

The reserve for the site has been estimated to 7 lakh tonnes

Production: However considering the factors such as geological disturbances, volume that cannot be mined due to flow of water and also considering the safety factor, approximately 2.5 lakh tonnes has been considered to as production or the extractable quantity from the mineable area for grant of Environmental Clearance. The amount of sand & *bajri* in the total extractable quantum is assumed to be around 60%, which is likely to be replenished due to sediment inflow, gradually during the monsoon seasons.

9.4 SITE FACILITIES AND UTILITIES

Water Supply

Water will be provided to workers for drinking & domestic purpose. Water will also be required for dust suppression. A total of 4.5 KLD water will be required for the proposed project.

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.

9.5 BASE LINE DATA

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, Ecology and Biodiversity.

Table 9.1 Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum & maximum concentrations of PM_{10} amongst all the 6 AQ monitoring stations were found to be 57.1µg/m^3 at AQ1 and 89.6µg/m^3 at AQ3. As far as the gaseous pollutants SO_2 and NO_2 are concerned, the prescribed CPCB limit of 80 µg/m^3 for residential and rural areas has never been surpassed at any station.
Noise Levels	The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the prescribed limits of NAAQS, at all the four locations monitored.
Water Quality	The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by IS: 10500. From surface water analysis results it is evident that most of the parameters of the samples comply with 'Category B' standards of CPCB, indicating their suitability for outdoor bathing (Organized).
Soil Quality	Samples collected from identified locations indicate the soil is sandy clayey type and the pH value ranging from 6.68 to 7.84, which shows that the soil is slightly alkaline in nature.
Ecology and Biodiversity	Aasan Conservation Reserve which is a habitat of migratory birds lies within the 10km radius of the study area. There are also around 10 reserved forests in the study area. And the project lies within the Doon valley which is an eco sensitive area.

9.6 ENVIRONMENTAL MANAGEMENT PLAN (EMP) & ITS IMPLEMENTATION

- Extraction will be done from the river bed leaving safety zone from bank & stream.
- The maximum working depth will remain above ground water table of the area.
- Provide health facilities to the workers & surrounding people in the impact area to reduce the health impacts.
- Ensuring wildlife protection & arranging awareness campaigns for the same.
- Minimize activities that release fine sediment to the river.
- Check on traffic load due to transportation & maintenance of evacuation route.
- Effective mitigation measures will be adopted to minimize disturbance during transportation & handling of minerals:
- Establishment of reclamation program with plantation of local/native & fast growing species
- Establishment of restoration plan during the closure of mine at the onset of monsoon season.
- Establishment of effective Disaster Management Plan to take timely precautionary measures to avoid effects of impending disasters.
- Establishment of effective Monitoring Program monitored by Environment Management Cell.

9.7 BUDGET ALLOCATION FOR EMP IMPLEMENTATION

Table for Cost of EMP

Sl. No	Description	Measures	Capital Cost (Rs. In lakhs)	Recurring Cost(in Rs. lakhs/annum)
1	Health Facilities	Medical Camps and Awareness program	2.5	4.82
2	Wildlife Protection	• Importance of Wildlife(Awareness) • Sign boards, information boards	- 0.5	0.05 0.1
3	Mineral transportation and Handling	• Repairing and maintenance of Roads • Water Sprinkling	0.5 -	0.6 2.4

4	Restoration and Reclamation	• Plantation • maintenance of Check dams and Retention wall • Restoration of banks	1.0 - -	0.36 0.3 0.2
Total			**4.5**	**8.83**

9.8 BENEFITS OF MINING

PHYSICAL BENEFITS: Road Transport, Market, Enhancement of green cover & Creation of community assets.

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

ENVIRONMENTAL BENEFITS:

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

CORPORATE SOCIAL RESPONSIBILITY

A percentage of the project cost will be allotted for the Corporate Social Responsibility for activities related to education, social causes, healthcare & environmental.

****

CHAPTER-X

DISCLOSURE OF CONSULTANT ENGAGED

The EIA/EMP Report for **River Aasan Lot No. 14/6 Sand, Bajri & Boulder Mining Project** has been prepared by Grass Roots Research & Creation India (P) Ltd.

Name of the Consultant	**Grass Roots Research & Creation India (P) Ltd.**	**ISO 9001: 2008 (QMS), 14001:2004 (EMS) & OHSAS 18001: 2007 Certified Co. Accredited by QCI/NABET.**
Address	**F:374- 375, Sector: 63, Noida, India**	

Name of the Laboratory	**GRC India Training and Analytical Laboratory**	**NABL Accredited Laboratory, Recognized by MoEF under Environment (Protection) Act, 1986. A unit of GRC India (P) Ltd.**
Address	**F- 375, Sector: 63, Noida, India**	

The EIA/EMP report has been prepared under the guidance of the following Coordinator & Functional Area Experts:

EIA Coordinator	**Mr. K D Choudhury**
FAE- AP	Mr. K D Choudhury
FAE- NV	Mr. K D Choudhury
FAE- EB	Dr. P R Chaudhari
FAE- WP	Dr. P R Chaudhari
FAE- SE	Mr. Vineet Pandey
FAE- Soil	Dr. S. R. Maley
FAE- Geology	Dr. Tapan Mazumder
FAE- Hydrology	Dr. Tapan Mazumder
FAE- RH	Dr. Ravindra Kode
FAE- Land Use	Mr. P Radhakrishnamoorthy
FAE- SHW	Mr. Dhiraj Kr. Singh
FAE- AQM	Prof. B Padmanabha Murty

The following team was involved under the guidance of experts for preparation of the report:

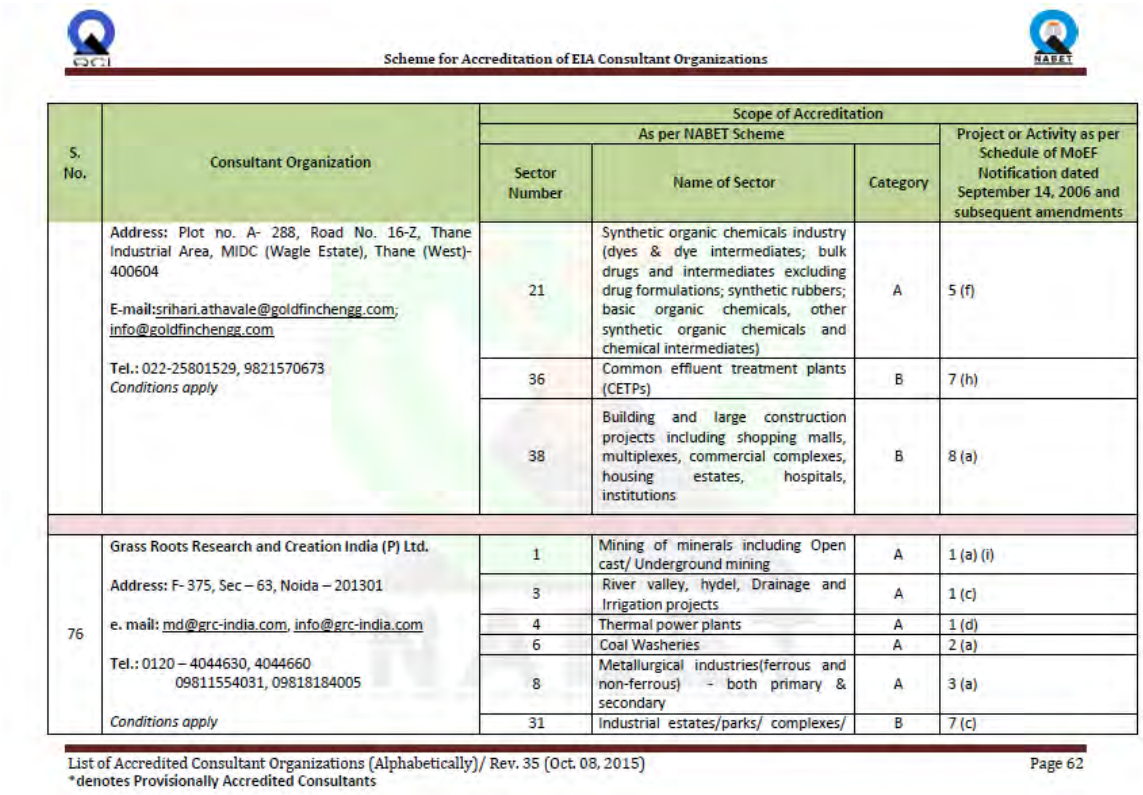
Personnel involved in Preparation of EIA/EMP report as Team Member	Ms. Surbhi Shukla (Project Associate)	
	Mr. Shahbaz Malik (Project Associate)	
	Mr. K.D. Choudhary	

Accreditation from Quality Council of India, QCI NABET

Grass Roots Research & Creation India (P) Ltd. has got the Initial accreditation from QCI NABET and has undergone Surveillance Assessment as well. The result of continued accreditation is published on the QCI website as SAAC 69th and subsequent Minutes of Meeting in the year 2013-14.

As per the recently published QCI NABET 'List of Accredited Consultant Organizations/Rev. 35/Oct 08, 2015', listed in as accredited consultant, Category 'A' Sl. No. 76. The list of accredited consultants is published on QCI NABET and MoEF websites as well.

For reference, a snapshots of the list where GRC India's name is listed is pasted below:



Scheme for Accreditation of EIA Consultant Organizations

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEF Notification dated September 14, 2006 and subsequent amendments
		Sector Number	Name of Sector	Category	
	Address: Plot no. A- 288, Road No. 16-Z, Thane Industrial Area, MIDC (Wagle Estate), Thane (West)-400604 E-mail:srihari.athavale@goldfinchengg.com; info@goldfinchengg.com Tel.: 022-25801529, 9821570673 *Conditions apply*	21	Synthetic organic chemicals industry (dyes & dye intermediates; bulk drugs and intermediates excluding drug formulations; synthetic rubbers; basic organic chemicals, other synthetic organic chemicals and chemical intermediates)	A	5 (f)
		36	Common effluent treatment plants (CETPs)	B	7 (h)
		38	Building and large construction projects including shopping malls, multiplexes, commercial complexes, housing estates, hospitals, institutions	B	8 (a)
76	Grass Roots Research and Creation India (P) Ltd. Address: F- 375, Sec – 63, Noida – 201301 e. mail: md@grc-india.com, info@grc-india.com Tel.: 0120 – 4044630, 4044660 09811554031, 09818184005 *Conditions apply*	1	Mining of minerals including Open cast/ Underground mining	A	1 (a) (i)
		3	River valley, hydel, Drainage and Irrigation projects	A	1 (c)
		4	Thermal power plants	A	1 (d)
		6	Coal Washeries	A	2 (a)
		8	Metallurgical industries(ferrous and non-ferrous) - both primary & secondary	A	3 (a)
		31	Industrial estates/parks/ complexes/	B	7 (c)

List of Accredited Consultant Organizations (Alphabetically)/ Rev. 35 (Oct. 08, 2015) Page 62
*denotes Provisionally Accredited Consultants

S. No.	Consultant Organization	Scope of Accreditation			
		As per NABET Scheme			Project or Activity as per Schedule of MoEF Notification dated September 14, 2006 and subsequent amendments
		Sector Number	Name of Sector	Category	
			Area, export processing Zones(EPZs), Special economic zones(SEZs), Biotech Parks, Leather Complexes		
		34	Highways, Railways, transport terminals, mass rapid transport systems	A	7 (f)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and large construction projects including shopping malls, multiplexes, commercial complexes, housing estates, hospitals, institutions	B	8 (a)
		39	Townships and Area development projects	B	8 (b)
77	Green Chem Solutions Pvt. Ltd.* Address: Plot No 883, 11th Street, Syndicate Bank Colony, Anna Nagar West Extension, Chennai 600 101. E-mail: greenchemsolutions@gmail.com Tel.: 044 – 42612103, 09790943811	36	Common effluent treatment plants (CETPs)	B	7 (h)
		37	Common municipal solid waste management facility (CMSWMF)	B	7 (i)
		38	Building and large construction projects including shopping malls, multiplexes, commercial complexes, housing estates, hospitals, institutions	B	8 (a)
		39	Townships and Area development	B	8 (b)

भूतत्व एवं खनिकर्म इकाई,
उद्योग निदेशालय उत्तराखण्ड भोपालपानी, देहरादून
संख्याः 58/भू0खनि0ई0/2012–13, दिनांकः 23 जनवरी, 2013

कार्यालय ज्ञाप

उत्तराखण्ड खनिज नीति 2011 के बिन्दु–2 के प्रस्तर–1 के अनुसार राज्य के राजस्व नदी उपखनिज क्षेत्रों में उपखनिज के चुगान के खनन पट्टे गढ़वाल मण्डल क्षेत्र में गढ़वाल मण्डल विकास निगम को उत्तराखण्ड उपखनिज परिहार नियमावली 2001 के नियमानुसार निर्धारित प्रपत्र एम0एम–1 में आवेदन करने के उपरान्त 05 वर्ष हेतु स्वीकृत किये जाने का प्राविधान के दृष्टिगत गढ़वाल मण्डल क्षेत्र के राजस्व नदी उपखनिज क्षेत्रों में उपखनिजों के चुगान का खनन पट्टा चाहने हेतु आवेदक प्रबन्ध निदेशक, गढ़वाल मण्डल विकास निगम, देहरादून द्वारा प्रस्तुत आवेदन पत्रों के सम्बन्ध में इस आशय पत्र (Letter of Intent) के माध्यम से राज्य सरकार आवेदक प्रबन्ध निदेशक, गढ़वाल मण्डल विकास निगम लि0 के पक्ष में उनके द्वारा आवेदित क्षेत्रों यथा जनपद देहरादून के 88 उपखनिज लॉटों तथा जनपद हरिद्वार के 28 उपखनिज लाटों में पौड़ी के 8 एवं जनपद टिहरी गढवाल के 29 उपखनिज लॉटों जिनका विवरण तालिका–1,2,3, व 4 में निम्नवत् उल्लिखित है, को में 05 (पांच) वर्ष की अवधि हेतु उपखनिज चुगान का खनन पट्टा स्वीकृत करने की मंशा रखती है:–

जनपद देहरादून के खनन क्षेत्र–

क्र0सं0	नदी का नाम	लॉट न0	क्षेत्रफल (है0)
1.	टौंस नदी	3/1	1.960
2.		3/2	3.970
3.		3/3	2.910
4.		3/4	7.280
5.		3/5	1.700
6.		3/6	16.770
7.		3/8	15.363
8.		टौंस कैन्ट	37.002
9.		3/9	3.963
10.		3/10	23.000
11.		3/11	11.100
12.		3/12	46.931
13.		3/13	6.000
14.		3/14	7.700
15.		4/2	4.720
16.		4/3	3.140
17.		4/4	8.100
18.		4/5	9.590

19.	रिस्पना नदी	4/6	9.850
20.		4/7	3.290
21.		4/8	17.460
22.		4/9	11.740
23.		4/10	9.600
24.		4/11	5.810
25.	बांदल नदी	6/1	7.848
26.	सौंग नदी	7/1	3.123
27.		7/2	156.700
28.		सौंग कैन्ट	56.576
29	नून नदी	8/1	23.030
30.		8/2	16.790
		8/3	50.069
		8/4	19.668
	बिन्दाल नदी	9/1	6.660
		9/2	40.480
		9/3	5.796
		9/4	20.631
	बिन्दाल कैन्ट		4.000
	नागलराव नदी	10/1	27.770
		10/2	3.983
	कालीगाढ़ नदी	11/1	3.437
	नलोटा नदी	11/2	6.269
	सुसवा नदी	12/1	8.316
43.		12/2	282.114
44		12/3	42.435
45.	जाखन नदी (रानीपोखरी कैन्ट)	13/1	38.891
	जाखन नदी(माजरी कैन्ट)	13/2	82.340
	आसन नदी	14/1	19.000
		14/2	21.094
		14/3	88.610
		14/4	35.405
51.		14/5	32.218
52.		14/6	32.709
53		14/7	4.000
		14/8	32.000
		14/9	45.000
		14/10	62.000
		14/11	31.000

58.		14/12	35.000
59.		14/13	20.667
60.		14/14	15.622
61.		14/15	11.040
62.	शीतला नदी	16/1	60.983
63.	सारना नदी	17/1	51.463
64.	नीम्मी नदी	18/1	8.400
65.	यमुना नदी	21/1	123.190
66.		21/2	27.561
67.		21/3	10.350
68.		23/1	30.035
69.		23/2	31.203
70.		23/3	14.970
71.	कालीराव नदी	5/1	8.903
72.	बाल्दी नदी	15/3, 15/4	31.120
73.	चन्द्रभागा नदी	ऋषिकेश	4.974
74.	गंगा नदी	ऋषिकेश	1.615
75.	अम्बाडी खाला	20/11	1.433
76.	मालसीगांव खाला	20/8	5.800
77.	नरूखाला नदी	20/12	0.450
78.	सुद्धोवाला	20/13	2.585
79.	चोरखाला	20/16	20.300
80.	कॉलागाढ़खाला	20/17	2.437
81.	दरेड नदी		10.120
82.	दोमटखाला	24/1	1.639
83.		24/2	2.061
	योग		2110.257

जनपद हरिद्वार के खनन क्षेत्र–

क्र0सं0	नदी का नाम	लॉट नं0	क्षेत्रफल (है0)
1.	गंगा नदी	भोगपुर–6	63.140
2.	गंगा नदी	बिशनपुर कुण्डी–8	137.450
3.	बुघवा शहीद (बिहारीगढ़)	बुघवा शहीद–10	104.504
4.	बंजारावाला (बिहारीगढ़)	बंजारावाला–11	72.329
5.	गंगनहर (रूड़की)	मोहम्मदपुर बाई पास	5.776
6.	सोनाली नदी (रूड़की)	खारिसखोपुर	9.150
7.	सोनाली नदी (रूड़की)	रतमाऊ/सोनाली	16.200
8.	रतमाऊ नदी	कोटा गुरदनगर	42.000

9.	सोनाली नदी (रूड़की)	सीसौना फ्रोम लोबा लिट	8.662
10.	रतमाऊ नदी (रूड़की)	ढालुवाला मजमात	3.448
11.	गंगा नदी	रामपुर रायघाटी (अहतमल)	61.232
12.	गंगा नदी	जसपुर रनजीतपुर(लक्सर)	3.398
13.	गंगा नदी	रायघाटी मुस्तहकम	4.000
14.	गंगा नदी	रायघाटी मुस्तहकम	10.000
15	बाण गंगा	निहन्दीपुर	3.410
16.	बाण गंगा	रायसी (लक्सर)	21.067
17.	बाण गंगा	बालावाली	31.570
18	पीली नदी	सज्जनपुर	10.000
19.	रऊ नदी	दादूवास	13.995
20	रऊ नदी	सुमन नगर	10.350
21	रऊ नदी	आनकी हेतमपुर	64.892
22	रऊ नदी	ज्वालापुर भगवानपुर	10.892
23	रऊ नदी	सलीम महदुद	7.702
24	रऊ नदी	गड रोशनाबाद	11.983
25	भगवानपुर शहीद वाला	भगवानपुर सिद्धवाला	24.933
26	गंगा नदी	धोबीघाट	143.000
27	गंगा नदी	अर्जीतपुर	32.208
28	गंगा नदी	किस्सरपुर	74.208
	कुल		1001.588

जनपद पौड़ी गढवाल के खनन क्षेत्र–

क्र0सं0	नदी का नाम	लॉट न0	क्षेत्रफल (है0)
1.	खो नदी	गढस्थान गुंज गडीघाट रतनापुर, कार्शीरामपुर, कोटद्वार गांव	66.255
2.	रुखरो नदी	बालभद्रपुर खुनीबर्द, सिम्बल खेरा	27.853
3.	नयार नदी	हुन्डुल उल्खेत	13.694
4.	नयार नदी	बरखालू	5.004
5.	नयार नदी	चमेलीसैंण	5.741
6.	नयार नदी	नौगांव	10.157
7	नयार नदी	मरोडा	7.023
8.	हेवल नदी	जोशियाडा	20.00
	कुल योग		155.732

टिहरी गढवाल के खनन क्षेत्र–

क्र0सं0	नदी/तहसील का नाम	लॉट न0	क्षेत्रफल (है0)
1.	अलकनन्दा नदी, देव प्रयाग	बगवान	5.256
2.		भल्दीगांव	1.181
3.		रानीहाट	10.539
4.		घिल्डीयालगांव	9.281
		मादी	3.027
		नैथाणा	9.712
		जुयालगढ	2.213
		चोपरू	1.0479- 1.070
	धनोल्टी	ग्वालीडांडा	0.451
		चिफल्डी	1.691
		ग्वालीडांडा	1.442
		हसेली	1.550
		तुनडी	0.105
		तोलियाकाटल	5.230
		भरवाकाटल	1.442
		दुबड्डा	0.850
		महेन्द्रपुर	2.400
		श्रीपुर	1.365
		तोर	0.723
20		मरोड	7.773
21		नौगांव	1.800
22		भूल्मांव भडोंगी	51.430
23		खाडाप्रोत खरसोन	1.158
24		कांडीखण्डीमाली	0.351
25		कांडीखण्डीताली	0.318
26		भूमी भोगी	0.266
27		सौनधाना	3.624
28	टिहरी	भट्टियारगांव	66.539
29	घनसाली	ऊखीमा	111.528
	कुल योग		304.931

2. आवेदक प्रबन्ध निदेशक, गढवाल मण्डल विकास निगम लि0 यदि उक्त तालिकाओ में उल्लेखित लांटो में उपखनिज चुगान का खनन पट्टा लेने हेतु सहमत हो तो शासनादेश संख्या 922/VII-1/11-रिट/2012,

दिनांक 26 जुलाई, 2012 में दिये गये निर्देशानुसार E.I.A Notification, 2006 के अन्तर्गत पर्यावरणीय स्वीकृति प्राप्त कर, पर्यावरणीय स्वीकृति की प्रति इस कार्यालय को प्रस्तुत करना सुनश्चित करें, ताकि नियमानुसार खनन पट्टा स्वीकृति हेतु अग्रेत्तर कार्यवाही की जा सकें।

भवदीय,

(शैलेश बगौली)
निदेशक,

पृष्ठांकन संख्याः (1)/तद्दिनांकित।

प्रतिलिपिः निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. प्रमुख सचिव, औद्योगिक विकास विभाग, उत्तराखण्ड शासन।
2. जिलाधिकारी, देहरादून/हरिद्वार/पौडी/टिहरी गढवाल।
3. प्रबन्ध निदेशक, गढवाल मण्डल विकास निगम लि0, देहरादून को इस आशय से प्रेषित कि E.I.A Notification, 2006 के अन्तर्गत पर्यावरणीय स्वीकृति प्राप्त कर इस कार्यालय को उपलब्ध कराना सुनिश्चित करें।
4. गार्ड फाईल।

(शैलेश बगौली)
निदेशक,

26-संयुक्त निरीक्षण रिपोर्ट

जिलाधिकारी महोदय देहरादून के पत्र संख्या 351/खनिज-नदी तल-2012 दिनाँक 16 अगस्त, 2012 तथा आदेश संख्या 390/खनिज/2012 दिनांक 30 अगस्त, 2012 एवं प्रमुख सचिव उत्तराखण्ड शासन के पत्र संख्या 2541/VII-11/146-ख/2009 दिनाँक 27 अक्टूबर, 2009 के अनुपालन में गठित समिति द्वारा जनपद देहरादून तहसील विकासनगर के ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर, सहसपुर स्थित आसन नदी तल जिसकी सीमाऐं ग्राम सहसपुर-सभावाला स्थित पुल से ऊपर ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर एवं सहसपुर के अन्दर तक का भाग है, का संयुक्त निरीक्षण दिनाँक 22.09.2012 को किया गया। खनन पट्टे हेतु आवेदित स्थल को राज्य सरकार में प्रचलित खनिज नीति-2011 के अनुसार सार्वजनिक स्थल पुल, नहर, सडक इत्यादि से 100-100 मीटर की दूरी छोडते हुये तथा नदी किनारे से नदी की चौडाई का 15% (प्रतिशत) भाग छोडकर उपखनिज खनन योग्य क्षेत्रफल सम्मलित किया गया है। जो निम्न प्रकार से है:-

क्र.सं.	जनपद	तहसील	ग्राम का नाम	नदी का नाम	लाट संख्या	खसरा नम्बर	कुल क्षेत्रफल (है.में)	खनन योग्य क्षेत्रफल	उपलब्ध उपखनिज
1	2	3	4	5	6	7	8	9	10
1.	देहरादून	विकासनगर	सभावाला, इन्द्रीपुर, लक्ष्मीपुर, सहसपुर	आसन नदी	14/6	2मि	36.7750	30.0000	रेत, बजरी,. बोल्डर (मिश्रित)
						1मि	2.2100	1.0000	
						585मि	1.3400	0.6000	
						593	0.8110	0.6090	
						594	1.0640	0.5000	
						कुल	42.2000	32.7090	

उपरोक्त प्रस्तावित उपखनिज सिविल नदी तल क्षेत्र में प्रचुर मात्रा में उपखनिज निक्षेपित है, जिसे राजस्व हित में खनन/चुगान किया जाना अति आवश्यक है। मौके पर उपस्थित वन विभाग, सिंचाई विभाग, खनन विभाग तथा राजस्व विभाग (गठित समिति के सदस्य/प्रतिनिधि) की आख्या निम्नवत् है:-

1.- <u>वन विभाग:-</u> वन विभाग के प्रतिनिधि श्री हीरा लाल वर्मा (आर.ओ.मल्हान) द्वारा अवगत कराया गया कि उप खनिज खनन/चुगान हेतु प्रस्तावित क्षेत्र सिविल भूमि है तथा वृक्षविहीन है, उक्त प्रस्तावित स्थल से स्थित वन की सीमा 03 किलोमीटर दूरी पर स्थित है। अतः उक्त प्रस्तावित राजस्व भूमि पर उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

2.- <u>सिचाँई विभाग:-</u> सिचाँई विभाग के प्रतिनिधि श्री डी.के.सिंह, सहायक अभियन्ता यान्त्रिक उपकरण एवं भण्डारण खण्ड प्रथम, सिंचाई विभाग द्वारा अवगत कराया गया कि प्रस्तावित स्थल पर वर्तमान में कोई निर्माण कार्य नही किया गया है। सहसपुर-सभावाला स्थित पुल से निर्धारित 100मीटर की दूरी छोडते हुये प्रस्तावित स्थल पर उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

3.- <u>भूतत्व एवं खनिकर्म विभाग:-</u> भूतत्व एवं खनिकर्म विभाग के प्रतिनिधि वीरेन्द्र कुमार सिंह, खान निरीक्षक देहरादून द्वारा उक्त प्रस्तावित स्थल पर प्रचुर मात्रा में उपखनिज रेत, बजरी, बोल्डर मिश्रित रूप में निक्षेपित है, जो प्रतिवर्ष वर्षाकाल में पानी के बहाव से एकत्रित होता रहता हैं। प्रस्तावित स्थल

एक तहत खण्ड में हैं तथा पहुँच मार्ग ग्राम लक्ष्मीपुर, सभावाला, रामपुर/सेन्ट्रल होट टाऊन से उपलब्ध है। अतः राजस्व हित में उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

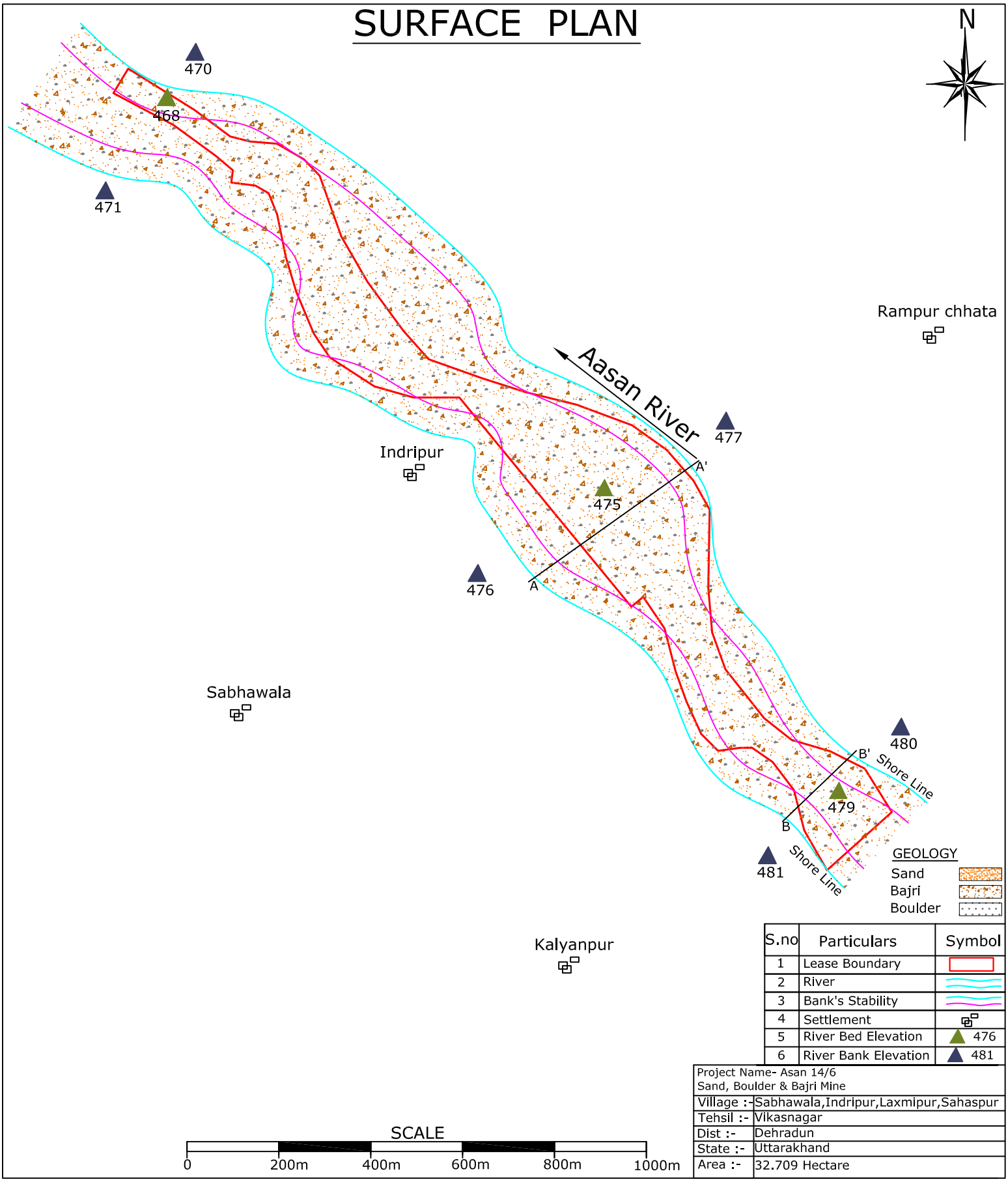
4.- <u>राजस्व विभाग:-</u> राजस्व विभाग के प्रतिनिधि श्री ऋषिपाल सिंह नेगी, श्री हीरा सिंह बिष्ट लेखपाल तहसील विकासनगर द्वारा अवगत कराया गया कि प्रस्तावित स्थल ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर एवं सहसपुर अन्तर्गत ख.न. 2मि, 1मि, 585मि, 593, 594 मध्य रकबा 42.2000है0 उत्तराखण्ड राज्य सरकार की भूमि है, जिसमें से खनन योग्य 32.7090है0 भूमि है। उक्त स्थल पर प्रचुर मात्रा में उपखनिज निक्षेपित है। अतः राजस्व हित में उक्त स्थल पर उपखनिज के खनन/चुगान की अनुमति दिये जाने पर कोई आपत्ति नही है।

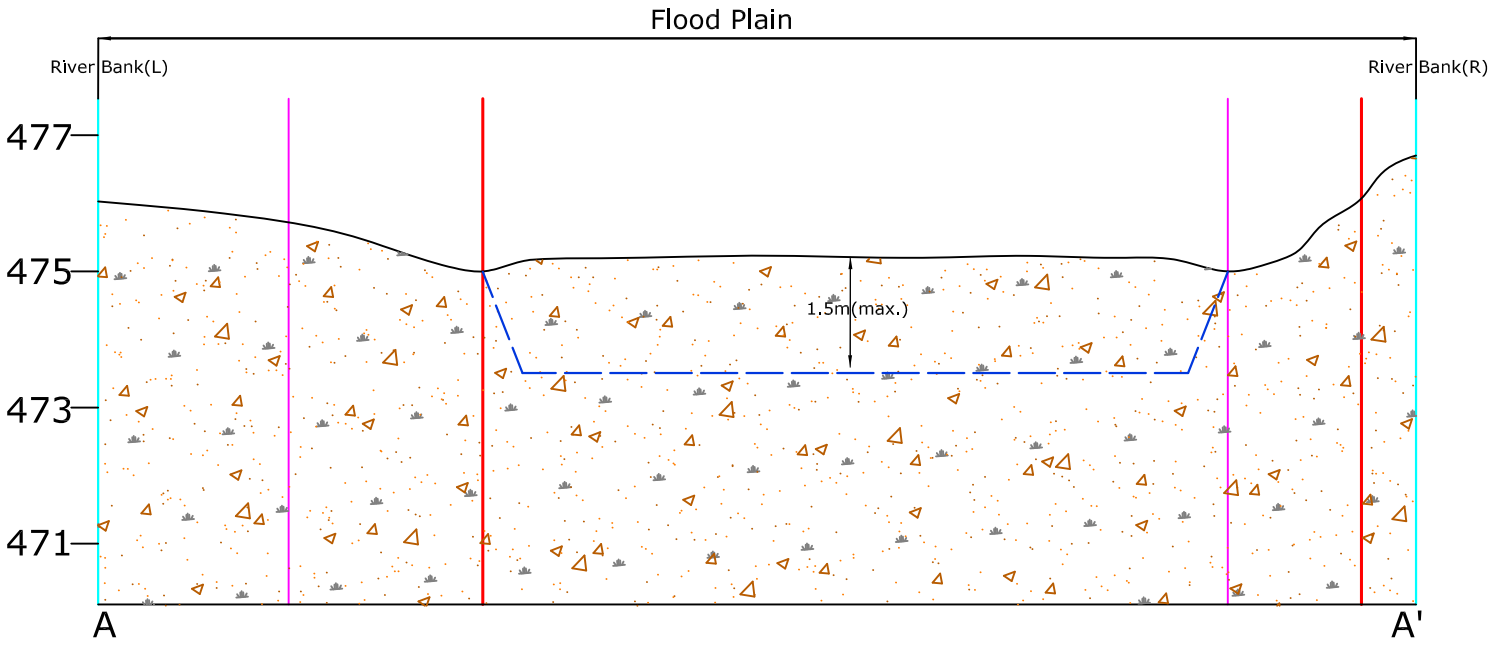
उल्लेखनीय है शासनादेश संख्या 922/VII-I/11-रिट/2012 दिनाँक 26 जुलाई, 2012 द्वारा राज्य के समस्त खनिज/उपखनिज क्षेत्रो के लिये खनन पट्टा स्वीकृत किये जाने से पूर्व पर्यावरण एवं वन मंत्रालय से पर्यावरणीय अनुमति प्राप्त करना आवश्यक है।

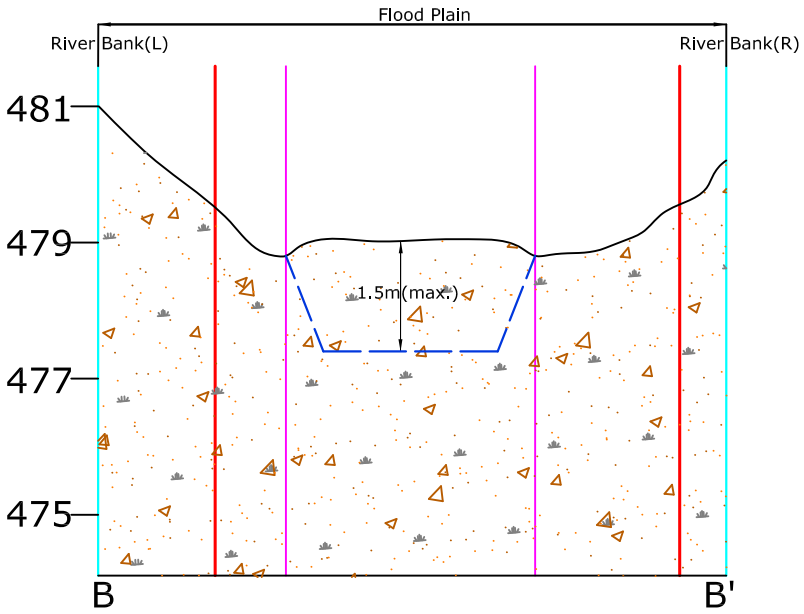
अतः उक्त के दृष्टिगत पर्यावरणीय स्वीकृति उपरान्त उक्त प्रस्तावित क्षेत्र को उपखनिज के खनन/चुगान के पट्टे पर दिये जाने हेतु संस्तुति की जाती है।

(हीरा लाले वर्मा)	(डी.के. सिंह)	(वीरेन्द्र कुमार सिंह)	(हर गिरी)
रेंज अधिकारी, मल्हान	सहायक अभियन्ता	खान निरीक्षक	तहसीलदार
वन विभाग	यान्त्रिक उपकरण एवं भण्डारण	भूतत्व एवं खनिकर्म विभाग देहरादून	विकासनगर

(अशोक कुमार पाण्डेय)
उपजिलाधिकारी
विकासनगर


SURFACE PLAN
N
470
468
471
Rampur chhata
Aasan River
477
Indripur
A'
475
476
A
Sabhawala
480
B'
Shore Line
479
B
481
Shore Line
GEOLOGY
Sand
Bajri
Boulder
Kalyanpur
S.no
Particulars
Symbol
1 Lease Boundary
2 River
3 Bank's Stability
4 Settlement
5 River Bed Elevation 476
6 River Bank Elevation 481
Project Name- Asan 14/6
Sand, Boulder & Bajri Mine
Village :- Sabhawala,Indripur,Laxmipur,Sahaspur
Tehsil :- Vikasnagar
Dist :- Dehradun
State :- Uttarakhand
Area :- 32.709 Hectare
SCALE
0
200m
400m
600m
800m
1000m





Lease Boundary
Shore Line
Max.depth of mining
Bank's Stability

GEOLOGY
Sand
Bajri
Boulder

Project Name- Asan 14/6 Sand, Boulder & Bajri Mine	
Village :-	Sabhawala,Indripur,Laxmipur,Sahaspur
Tehsil :-	Vikasnagar
Dist :-	Dehradun
State :-	Uttarakhand
Area :-	32.709 Hectare

ANNEXURE III

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013				AAQ-1 Selaqui	
S.No	Date	$PM_{2.5}$, µg/m3	PM_{10},µg/m^3	SO_2 µg/m^3 ,	NO_2, µg/m^3
		CPCB Guideline Volume (part- I)	IS:5182 (Part- XXIII)	IS:5182 (Part- II)	IS:5182 (Part- VI)
1	03.10.2013	28.0	62.7	5.6	15.1
2	08.10.2013	25.5	57.1	5.5	14.8
3	12.10.2013	28.6	64.1	6.7	18.0
4	16.10.2013	24.7	57.8	BDL	16.1
5	20.10.2013	29.0	67.9	5.6	15.1
6	24.10.2013	25.0	58.5	7.2	20.2
7	28.10.2013	27.9	65.3	5.7	15.3
8	30.10.2013	25.3	59.2	6.8	19.6
9	05.11.2013	27.2	63.6	5.3	13.1
10	09.11.2013	29.0	67.9	5.9	13.5
11	13.11.2013	24.6	57.6	BDL	12.4
12	17.11.2013	28.2	66.0	6.3	14.4
13	21.11.2013	26.3	69.4	6.0	13.7
14	25.11.2013	25.1	66.3	7.0	16.0
15	28.11.2013	27.3	72.1	5.5	14.8
16	30.11.2013	23.9	63.1	7.4	21.5
17	03.12.2013	27.6	72.9	5.3	14.3
18	07.12.2013	30.2	79.7	5.9	15.9
19	11.12.2013	27.5	72.6	6.9	18.6
20	15.12.2013	28.3	74.7	5.6	15.1
21	19.12.2013	26.5	70.0	5.5	16.3
22	23.12.2013	25.0	66.0	5.3	14.3
23	27.12.2013	27.9	73.7	5.5	17.5
24	30.12.2013	26.3	69.4	5.7	15.3
	Min	**23.9**	**57.1**	**BDL**	**12.4**
	Max	**30.2**	**79.7**	**7.4**	**21.5**
	Average	**26.9**	**66.6**	**6.0**	**15.9**
	98 Percentile	**29.6**	**77.4**	**7.3**	**20.9**
NAAQS, For 24 hourly		**60**	**100**	**80**	**80**

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013				AAQ-2 Mahmudnagar	
S.No	Date	$PM_{2.5}$, µg/m3	PM_{10},µg/m^3	SO_2 µg/m^3 ,	NO_2, µg/m^3
		CPCB Guideline Volume (part- I)	IS:5182 (Part- XXIII)	IS:5182 (Part- II)	IS:5182 (Part- VI)
1	01.10.2013	35.3	71.7	5.3	16.5
2	06.10.2013	33.5	69.4	5.1	18.3
3	10.10.2013	31.2	68.5	BDL	16.1
4	14.10.2013	37.4	72.2	5.2	18.3
5	18.10.2013	35.3	71.7	5.1	17.5
6	22.10.2013	32.5	65.4	BDL	16.2
7	26.10.2013	36.2	70.2	5.3	19.5
8	29.10.2013	32.4	66.3	BDL	16.7
9	03.11.2013	37.5	71.5	5.2	17.5
10	07.11.2013	31.9	64.9	BDL	16.2
11	11.11.2013	32.5	65.8	BDL	16.7
12	15.11.2013	32.7	68.2	5.1	19.6
13	19.11.2013	35.3	70.7	5.2	16.1
14	23.11.2013	33.4	64.4	BDL	16.5
15	26.11.2013	39.5	74.3	5.8	18.4
16	29.11.2013	43.2	79.2	6.5	21.5
17	01.12.2013	37.6	76.3	5.4	17.1
18	05.12.2013	39.4	73.3	5.3	18.5
19	09.12.2013	34.5	71.5	5.1	17.3
20	13.12.2013	33.6	65.9	BDL	16.7
21	17.12.2013	31.1	63.5	BDL	17.2
22	21.12.2013	34.2	65.6	5.2	18.3
23	24.12.2013	31.8	63.3	BDL	16.5
24	28.12.2013	33.4	67.5	5.3	17.4
	Min	**31.1**	**63.3**	**BDL**	**16.1**
	Max	**43.2**	**79.2**	**6.5**	**21.5**
	Average	**34.8**	**69.2**	**5.3**	**17.5**
	98th Percentile	**41.5**	**77.9**	**6.3**	**20.6**
NAAQS, For 24 hourly monitoring		**60**	**100**	**80**	**80**

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013				AAQ-3 Shishambada	
S.No	Date	$PM_{2.5}$, µg/m3	PM_{10},µg/m^3	SO_2 µg/m^3 ,	NO_2, µg/m^3
		CPCB Guideline Volume (part- I)	IS:5182 (Part- XXIII)	IS:5182 (Part- II)	IS:5182 (Part- VI)
1	03.10.2013	34.8	78.5	6.2	21.7
2	08.10.2013	37.5	82.4	5.9	19.9
3	12.10.2013	34.9	80.4	5.2	18.7
4	16.10.2013	35.5	76.3	5.2	20.5
5	20.10.2013	36.3	79.2	5.4	17.6
6	24.10.2013	38.4	78.5	5.7	18.8
7	28.10.2013	33.6	72.4	5.1	19.3
8	30.10.2013	39.2	86.3	5.8	21.4
9	05.11.2013	31.4	81.6	5.2	19.2
10	09.11.2013	33.9	79.5	6.1	21.5
11	13.11.2013	31.1	78.4	BDL	18.7
12	17.11.2013	41.7	89.6	6.0	21.3
13	21.11.2013	38.2	84.2	5.4	19.5
14	25.11.2013	35.1	78.7	5.5	23.4
15	28.11.2013	36.4	75.8	5.1	19.5
16	30.11.2013	39.1	86.2	5.8	20.9
17	03.12.2013	35.5	78.5	5.1	18.6
18	07.12.2013	32.9	75.1	BDL	19.7
19	11.12.2013	34.7	69.4	5.3	21.1
20	15.12.2013	32.2	74.6	5.7	20.3
21	19.12.2013	36.6	78.3	BDL	17.5
22	23.12.2013	31.8	81.2	5.2	20.4
23	27.12.2013	39.8	88.1	5.5	21.5
24	30.12.2013	34.8	71.6	6.5	18.5
	Min	**31.1**	**69.4**	**BDL**	**17.5**
	Max	**41.7**	**89.6**	**6.5**	**23.4**
	Average	**35.6**	**79.4**	**5.6**	**20.0**
	98 Percentile	**40.8**	**88.9**	**6.4**	**22.6**
NAAQS, For 24 hourly monitoring		**60**	**100**	**80**	**80**

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013					AAQ- 4 Tiparpur
S.No	Date	$PM_{2.5}$, µg/m3	PM_{10},µg/m^3	SO_2 µg/m^3,	NO_2, µg/m^3
		CPCB Guideline Volume (part- I)	IS:5182 (Part- XXIII)	IS:5182 (Part- II)	IS:5182 (Part- VI)
1	01.10.2013	36.2	81.2	5.9	19.5
2	06.10.2013	37.6	83.6	5.4	17.6
3	10.10.2013	39.1	85.4	6.1	20.2
4	14.10.2013	38.9	78.8	BDL	16.3
5	18.10.2013	35.6	81.4	5.2	15.3
6	22.10.2013	39.4	75.5	BDL	17.4
7	26.10.2013	35.6	82.5	5.2	16.6
8	29.10.2013	37.4	81.4	6.2	20.2
9	03.11.2013	35.7	76.4	BDL	16.3
10	07.11.2013	38.5	78.6	5.9	18.6
11	11.11.2013	35.0	74.8	BDL	17.1
12	15.11.2013	36.5	81.4	6.1	19.1
13	19.11.2013	41.5	84.2	6.2	20.8
14	23.11.2013	37.1	83.1	5.4	15.2
15	26.11.2013	34.6	67.9	5.3	17.4
16	29.11.2013	35.4	78.3	BDL	18.2
17	01.12.2013	38.2	80.4	5.2	15.3
18	05.12.2013	35.4	78.5	BDL	17.3
19	09.12.2013	34.6	67.9	BDL	18.2
20	13.12.2013	36.7	71.8	5.2	16.7
21	17.12.2013	39.2	81.4	6.0	18.8
22	21.12.2013	35.7	69.5	5.3	19.0
23	24.12.2013	33.5	75.4	BDL	15.6
24	28.12.2013	36.2	79.6	5.6	17.8
	Min	**33.5**	**67.9**	**BDL**	**15.2**
	Max	**41.5**	**85.4**	**6.3**	**20.8**
	Average	**36.8**	**78.3**	**5.6**	**17.7**
	98 Percentile	**40.5**	**84.8**	**6.2**	**20.5**
NAAQS, For 24 hourly monitoring		**60**	**100**	**80**	**80**

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013				AAQ-5 Kalyanpur (Project Site)	
S.No	Date	$PM_{2.5}$, µg/m3	PM_{10},µg/m^3	SO_2 µg/m^3 ,	NO_2, µg/m^3
		CPCB Guideline Volume (part- I)	IS:5182 (Part- XXIII)	IS:5182 (Part- II)	IS:5182 (Part- VI)
1	03.10.2013	32.6	71.5	5.6	17.5
2	08.10.2013	34.6	77.8	5.1	15.3
3	12.10.2013	32.7	69.8	BDL	11.7
4	16.10.2013	33.3	66.7	BDL	15.2
5	20.10.2013	34.1	72.4	5.5	16.8
6	24.10.2013	36.5	69.4	5.3	17.3
7	28.10.2013	31.7	66.2	BDL	18.2
8	30.10.2013	38.0	75.7	5.4	16.6
9	05.11.2013	29.5	63.1	BDL	12.7
10	09.11.2013	32.0	68.9	5.7	18.0
11	13.11.2013	28.5	70.7	BDL	16.2
12	17.11.2013	35.2	79.8	5.6	17.0
13	21.11.2013	31.5	73.6	BDL	14.9
14	25.11.2013	32.5	68.1	BDL	13.5
15	28.11.2013	33.8	65.2	6.1	17.0
16	30.11.2013	36.5	75.6	BDL	16.6
17	03.12.2013	32.9	67.9	5.5	17.7
18	07.12.2013	30.3	64.6	BDL	13.7
19	11.12.2013	32.5	67.0	BDL	15.4
20	15.12.2013	30.0	64.1	5.3	19.5
21	19.12.2013	34.4	67.8	BDL	13.6
22	23.12.2013	29.6	66.3	BDL	16.6
23	27.12.2013	37.6	77.6	5.6	17.0
24	30.12.2013	33.5	68.8	BDL	15.7
	Min	**28.5**	**63.1**	**BDL**	**11.7**
	Max	**38.0**	**79.8**	**6.1**	**19.5**
	Average	**33.1**	**69.9**	**5.5**	**16.0**
	98th Percentile	**37.8**	**78.9**	**6.0**	**18.9**
NAAQS, For 24 hourly monitoring		**60**	**100**	**80**	**80**

River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mine, Dehradun Site					
Ambient Air Quality Data Oct to Dec 2013				AAQ-6 (chhorba)	
S.No	Date	$PM_{2.5}$, µg/m3 CPCB Guideline Volume (part- I)	PM_{10},µg/m^3 IS:5182 (Part- XXIII)	SO_2 µg/m^3 , IS:5182 (Part- II)	NO_2, µg/m^3 IS:5182 (Part- VI)
1	03.10.2013	29.5	66.1	5.7	13.2
2	08.10.2013	29.1	65.2	5.6	13.0
3	12.10.2013	30.7	68.8	5.5	12.8
4	16.10.2013	25.0	58.5	BDL	13.5
5	20.10.2013	27.7	64.8	BDL	13.2
6	24.10.2013	29.9	70.0	BDL	11.8
7	28.10.2013	30.9	72.3	5.8	13.5
8	30.10.2013	25.2	59.0	BDL	10.2
9	05.11.2013	28.5	66.7	5.5	12.8
10	09.11.2013	30.4	71.1	5.7	13.2
11	13.11.2013	32.8	76.8	5.5	12.8
12	17.11.2013	29.9	70.0	BDL	14.2
13	21.11.2013	31.2	82.4	5.8	13.5
14	25.11.2013	27.6	72.9	6.0	13.9
15	28.11.2013	27.1	71.5	5.6	13.0
16	30.11.2013	26.2	69.2	BDL	11.6
17	03.12.2013	24.9	65.7	BDL	11.8
18	07.12.2013	27.7	73.1	BDL	13.9
19	11.12.2013	30.5	80.5	6.4	14.8
20	15.12.2013	29.9	78.9	5.7	13.2
21	19.12.2013	27.7	73.1	5.3	12.3
22	23.12.2013	26.1	68.9	BDL	11.8
23	27.12.2013	26.4	69.7	5.6	13.0
24	30.12.2013	25.9	68.4	5.5	12.8
	Min	**24.9**	**58.5**	BDL	**10.2**
	Max	**32.8**	**82.4**	**6.4**	**14.8**
	Average	**28.4**	**70.1**	**5.7**	**12.9**
	98 Percentile	**32.1**	**81.5**	**6.3**	**14.5**
NAAQS, For 24 hourly		**60**	**100**	**80**	**80**

PROFORMA FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS

(MINING SECTOR PROJECTS)

Note 1: All information to be given in the form of Annex/s should be properly numbered and form part of reply to this proforma.

Note 2: Please enter √ in appropriate box where answer is Yes / No

Note 3: No abbreviation to be used - **Not available** or **Not applicable** should be clearly mentioned.

Note 4: **Core zone** is the mining lease area.

Buffer zone in case of ML area up to 25 ha is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha an area **10 km** all around the periphery of the core zone.

Note 5: Adopt **Scoping process** in carrying out EIA study.

1.	**General information**	
a	Name of the project	River Aasan Lot No. 14/6 Sand, *Bajri* & Boulder Mining Project
I	Name of the proponent	Garhwal Mandal Vikas Nigam (GMVN) Limited.
ii	Mailing Address	Garhwal Mandal Vikas Nigam Limited, 74/1 Rajpur Road, Dehradun Uttarakhand
	E-mail	gmvnl@gmvnl.com
	Telephone	0135-2746817, 2749308
	Fax No.	-
b	Objective of the project	River bed mining for sand, *bajri* & boulder.
c	Location of mine	
	Village	Sabhawala, Indripur, Lakshmipur & Sahaspur
	Taluka	Vikasnagar
	District	Dehradun
	State	Uttarakhand.

d	Does the proposal relate to	**Yes**	**No**
i	New mine	√	-
ii	Expansion	-	√
iii	Increase in ML area	-	√
iv	Increase in annual production	-	√
v	Renewal of ML	-	√
vi	Modernization	-	√
e	Site Information		
i	Geographical Location		
	Latitude	30°22'55.45"N to 30°22'3.32"N	
	Longitude	77°47'57.12"E to 77°48'58.89"E	
	Survey of India Topo sheet number	53F15 (Site)	
	Elevation above Mean Sea Level	Highest:479m AMSL Lowest: 468m AMSL	
	Total mining lease area (in ha.)	32.709 ha	
ii	Dominant nature of terrain	**Yes**	**No**
	Flat	-	√
	Undulated	√	-
	Hilly	-	√
2.	**Land usage of the mining lease area (in ha.)**		
a	Agricultural	-	
b	Forest	-	
c	Waste land	-	
d	Grazing	-	
e	Surface water bodies	-	
f	Others (River bed of Aasan)	32.709 ha	
	Total	32.709 ha	
3.	**Indicate the seismic zone in which ML area falls. In case of zone IV & V, details of earth quakes in last 10 years.**	**Seismic Zone - IV Earthquake data of last 10 years attached as annexure V**	
a	Severity (Richter Scale)		
b	Impact i.e. Damage to	**Yes**	**No**
	Life	-	√
	Property	-	√
	Existing mine	-	√

4. Break-up of mining lease area (in ha.) as per approved conceptual plan:

Purpose	Mining Lease Area				Total	Area acquired				Area to be acquired			
	Government		Private			Government		Private		Government		Private	
	Forest	Others	Agri.	Others		Forest	Others	Agri.	Others	Forest	Others	Agri.	Others
1. Area to be excavated	-	26	-	-	26		26	-	-	-	-	-	-
2. Storage for top soil	-	-	-	-	-		-	-	-	-	-	-	-
3. Overburden / Dumps	-	-	-	-	-		-	-	-	-	-	-	-
4. Mineral storage	-	-	-	-	-		-	-	-	-	-	-	-
5. Infrastructure	-	-	-	-	-		-	-	-	-	-	-	-
6. Roads	-	-	-	-	-		-	-	-	-	-	-	-
7. Railways	-	-	-	-	-		-	-	-	-	-	-	-
8. Green Belt	-	-	-	-	-		-	-	-	-	-	-	-
9.Tailings pond	-	-	-	-	-		-	-	-	-	-	-	-
10.Effluent treatment plant	-	-	-	-	-		-	-	-	-	-	-	-
11.Coal handling plant / mineral separation plant	-	-	-	-	-		-	-	-	-	-	-	-
12. Township area	-	-	-	-	-		-	-	-	-	-	-	-
13.Other (Bank stability)	-	6.709	-	-	6.709		6.709	-	-	-	-	-	-
TOTAL	-	32.709	**-**	**-**	32.709		32.709	-	-	-	-	-	-

5	**Township (outside mining lease)**			**Not Applicable**	
a	Total area (in ha)			**-**	
b	No. of dwelling units			**-**	
c	Distance from mine site			**-**	
6	**Distance of water bodies (in km)**				
Distance from		River Bank *		Other Water bodies * Sea / creek / lake / nalla etc. (specify)	
Mining lease boundary		It is a river bed mining		**-**	
Ancillary facilities		**-**		**-**	
[* From highest flood line/high tide line]					
7	For projects falling within the Coastal Regulation Zone (CRZ)				
	Whether the mineral to be mined is of rare nature and not available outside CRZ?	**Yes**	**-**	**No**	√
if yes, annex a scaled location map showing low tide line (LTL), high tide line (HTL) duly demarcated by one of the authorized agencies* [*Director, Space Application Centre, Ahmedabad: Centre for Earth Sciences Studies, Thiruvananthapuram: Institute of Remote Sensing, Anna University, Chennai: Institute of Wetland Management & Ecological Designs, KolKata: Naval Hydrographers's Office, Dehradun: National Institute of Oceanography, Panjim, Goa: and National Institute of Ocean Technology, Chennai], boundary of mining lease area, distance of ML area from LTL and HTL CRZ boundary and CRZ classification of the project area as per the approved Coastal Zone Management Plan, and settlements, sand dunes, mangroves, forest land/patches, turtles breeding and nesting sites etc., if any, in the project area.					

8	**Indicate aerial distance from the periphery of core zone / area from the periphery of the buffer zone to the boundary of following (up to 10 km):**			
S. No.	Area	Name	Aerial distance from (in km.)	
			Core Zone	Buffer Zone
1.	National Park / Sanctuary	Nil	-	-
2.	Biosphere Reserve / Tiger Reserve / Elephant Reserve / any other Reserve	Nil	-	-
3.	Forest (RF / PF / unclassified)	Chandpur RF Chuharpur RF Laldhang RF	About 5 Km in NNE direction. About 5 Km in N direction. About 9 Km in	-

			NNW direction.	
		Charwa RF	About 6 Km in N direction.	
		Dobri RF	About 7 Km in NNE direction.	
		Atak Farm RF	About 6 Km in NE direction.	
		Bain Khala Bit RF	About 6 Km in ENE direction.	
		Jhajra Block RF	About 7 Km in E direction.	
		Malhan RF	About 2 Km in S direction.	
		Darawat RF	About 8 Km in WSW direction.	
4.	Habitat for migratory birds	Nil	-	
5.	Corridor for animals of schedule I & II of the Wildlife (Protection) Act, 1972	Nil	-	-
6.	Archaeological sites * Notified * Others	Nil	-	-
7.	Defence Installation	Nil	-	-
8.	Industries / Thermal Power Plants	Nil	-	-
9.	Other Mines	Aasan lot no.14/4 Aasan lot no.14/5 Aasan lot no.14/3 Aasan lot no.14/7	adjacent in east adjacent in east 1.5 km in east 2 km in West	-
10.	Airport	Nil	-	-
11.	Railway Lines	Nil	-	-
12.	National / State Highways	NH-72	1.5 km NE	-
[* Buffer zone in case of ML area up to 25 ha. is to be considered as **5 km** all around the periphery of the core zone and for ML area above 25 ha. an area **10 km** all around the periphery of the core zone].				

9. Description of flora & fauna separately in the core and buffer zones.*

[* Consult the Wildlife (Protection) Act, 1972 as amended subsequently and list species with (1) Common name (2) Scientific name and (3) under which schedule of the Wildlife (Protection) Act the identified species fall. Get the list authenticated by an Expert in the field / credible scientific institute / University / Chief Wildlife Warden Office. **Information to be based on field survey.]**
List of Flora & Fauna is given in chapter III of Draft EIA report.

10	**Details of mineral reserves (as per approved Mining Plan)**	Quantity (in tonnes)	
a	Proved	-	
b	Indicated	**-**	
c	Inferred	**-**	
d	Mineable reserves	7 lakh Tonnes	
11	**Major geological formation / disturbances in the mining lease area**	**Yes**	**No**
a	Geological maps submitted	**-**	√
b	Geological sections submitted	√	**-**
c	Contour map submitted	**-**	√
d	Whether the presence, if any, noted of		
I	Faults	**-**	√
Ii	Dykes	**-**	√
Iii	Shear Zone	**-**	√
Iv	Folds	**-**	√
V	Other weak zones	**-**	√
e	Source of data (Indicate)	-	
12	**Production of mineral(s) and life of mine**		
a	Rated capacity of mine mineral wise (Tonnes / annum)	2.5 lakh tonnes	
b	Life of mine at proposed capacity (Years)	Not applicable as the mineral (Sand & *Bajri*) is replenishable	
c	Lease period (Years)	Lease is yet to be granted	
d	Date of expiry of lease (D /M /Y)	-	
e	Indicate in case of existing mines		
i	Date of opening of mine	-	
ii	Production in the last 5 years 1st year 5th year from year…… to year …… in million tonnes.	**-**	
iii	Projected production for the next 6th to 10th year 5 years from year …… to year ……in million tonnes.		
iv	Whether mining was suspended after opening of the mine?	**-**	
v	If yes, details thereof including last production figure and reason for the same.	**-**	
f	Whether plans & sections provided?	**-**	

13	**Type and method of mining operations**			
TYPE			**METHOD**	
Opencast		√	Manual	√
Underground		-	-	**-**
Both		-	-	**-**
14	**Details of ancillary operations for mineral processing**			
a	Existing		Not applicable	
b	Additional		Not applicable	
15	**Mine details**			
a	**Opencast mine**			
i	Stripping ratio (mineral in tonnes to over burden in m^3)		-	
ii	Ultimate working depth (in m bgl)		1.5 m bgl or above ground water table whichever comes first	
iii	Indicate present working depth in case of existing mine (in m bgl)		-	
iv	Thickness of top soil (in m.)		-	
a	Minimum		-	
b	Maximum		-	
c	Average		-	
v	Thickness of overburden (in m.)		**-**	
a	Minimum		**-**	
b	Maximum		**-**	
c	Average		**-**	
vi	Mining Plan			
a	Height and width of the bench in overburden / waste.		-	
b	Height & width of the bench in ore body / coal seam.		-	
c	Proposed inclination / slope of the sides of the opencast mine (separately for overburden, coal / ore and overall slope of the pit sides) both while operating the mine as well as at the time of closure of the mine.		-	
d	Whether transverse sections across the open cast mine at the end of fifth year and at the end of the life of the mine have been submitted?		-	
vii	Type of blasting, if any, to be adopted		-	
b	Underground mine		**Not Applicable**	
i	Seam / Ore body			
	Min. Depth (m)		-	
	Max. Depth (m)		-	
	Avg. thickness (m)		-	
	Rate of dip		-	
	Direction of dip in degree		-	

ii	Mode of entry into the mine		
	Shaft	-	
	Adit	-	
	Incline	-	
iii	Details of machinery		
	On surface	-	
	At Face	-	
	For transportation	-	
	Others	-	
iv	Method of stopping (metalliferrous mines)		
	Open	-	
	Filled	-	
	Shrinkage	-	
	Caving	-	
	Combination of above	-	
	Others (Specify)	-	
v	Extraction method		
	Caving	-	
	Stowing	-	
	Partial extraction	-	
vi	Subsidence		
	Predicted max. subsidence (in m)	-	
	Max. value of tensile strain (in mm/m)	-	
	Max. slope change (in mm/m)	-	
	Whether identified possible subsidence area(s) superimposed on Surface Plan has been submitted?	-	
	Major impacts on surface features like natural drainage pattern, houses, buildings, water bodies, roads, forest, etc.	-	
	Salient features of subsidence Management (monitoring and control).	-	
16	**Surface drainage pattern at mine site**	**Yes**	**No**
a	Whether the pre-mining surface drainage plan submitted?	√	-
b	Do you propose any modification / diversion in the existing natural drainage pattern at any stage? If yes, when. Provide location map indicating contours, dimensions of water body to be diverted, direction of flow of water and proposed route / changes, if any i.e. realignment of river / nallah / any other water body falling within core zone and its impact	-	√
17	**Embankment and / or weir construction**		
a	Do you propose, at any stage, construction of:		
i	Embankment for protection against flood?	No. There are already existing embankments, which will be maintained & repaired.	

ii	Weir for water storage for the mine?		No	
b	If so, provide details thereof.		-	
c	Impact of embankment on HFL and settlement around.		-	
d	**Impact of weir on downstream users of water**		-	
18	**Vehicular traffic density (outside the ML area)**			
		Type of vehicles	No. of vehicles per day (in PCU)	
a	Existing	Car, Jeep, Truck	Near village Rampur chhota: 120 Near Village Lachhmipur: 140	
b	After the proposed activity	Car, Jeep, Truck	Near village Rampur chhota: 453 Near Village Lachhmipur: 473	
c	Whether the existing road network is adequate?		Yes	
d	If no, provide details of alternative proposal?		The haul roads will be repaired regularly	
19	**Loading, transportation and unloading of mineral and waste rocks on surface**		**Yes**	**No**
a	Manual		√	-
b	Tubs, mine cars, etc.		-	√
c	Scraper, shovels, dumpers / trucks		√	-
d	Conveyors (belt, chain, etc.)		-	√
e	Others (specify)		-	√
20	**Mineral(s) transportation outside the ML area**			

		Qty. (in TPD)	**Percentage (%)**	**Length (in km)**
a	Road	1111	100	-
b	Rail	-	-	-
c	Conveyors	-	-	-
d	Rope way	-	-	-
e	Water ways	-	-	-
f	Pipeline	-	-	-
g	Others (Specify)	-	-	-
	Total	**1111**	**100**	

21. Baseline Meteorological and Air Quality data

(a) Micro-meteorological data

[Continuous monitoring through autographic instrument for one full season other than monsoon]

Month	Wind Speed (kmph)			Temperature (°C)			Relative Humidity (%)			Rain Fall * (mm)			Cloud Cover** (Octas of sky)
	Mean	Max.	% of calm	Mean (Dry Bulb)	Highest	Lowest	Mean	Highest	Lowest	Total	24-hours Highest	No. of rainy days	Mean
October, 13	2.4	8.6	29	17.3	29.2	7.2	56.9	95.5	22.0	21.5	2.5	9	5
November, 13	2.0	6.3	27	16.0	27.3	6.0	56.6	95.7	21.8	0.2	0.1	2	3
December, 13	1.7	7.7	28	14.6	23.9	5.2	56.2	95.2	21.3	0.9	0. 3	3	2

(i) Wind rose pattern for one full season (16 points of compass i.e. N, NNE, NE, ---) based on 24-hourly data. For coastal area also furnish day-time and night time data.

The windrose pattern has been considered for post monsoon season. The monitoring has been done for one month i.e. October during this season. (windrose shown in chapter III) (pg.no. 41)

- Day time: Not Applicable
- Night time: Not Applicable
- 24 – hours period.

(ii) Site specific monitored data

* 24-hours rainfall should be reported from 08:30 hrs. IST of previous day to 08:30 hrs. IST of the day.

* Rainy day is considered when 24 hrs. rainfall is ≥ 2.5 mm.

** Visual observations of cloud cover should be recorded four times a day at regular intervals.

(iii) Indicate name and distance of the nearest IMD meteorological station from which climatological data have been obtained

for reporting in the EIA report, if any. **Dehradun**

(b) Ambient air quality data* (RPM, SPM, SO_2, and NOx)

[*Monitoring should be carried out covering one full season except monsoon – same season as in 21 (a) (i)]

[*Frequency of sampling: Sampling to be done twice a week for the entire season 24 hourly for SPM & RPM. For gaseous pollutants 24- hourly data be given irrespective of the sampling period.]

(i) Season and period for which monitoring has been carried out. Post Monsoon **(October –December 2013)**

(ii) No. of samples collected at each monitoring station **(24)**

Name of monitoring equipment used			$PM_{2.5}$(µg/ m^3)			PM_{10}(µg/ m^3)			SO_2(µg/ m^3)			No_x(µg/ m^3)		
			FPS – APM 550 (Envirotech)			RDS –APM 460 BL (Envirotech)			APM 411 attachment with RDS 460 BL			APM 411 attachment with RDS 460 BL		
Equipment sensitivity			< 0.5 µg/m^3 from 0.000 mg to 0.100 mg/ m^3			< 0.5 µg/m^3 from 0.000 mg to 0.100 mg/ m^3			< 0.5 µg/m^3 from 0.000 mg to 0.100 mg/ m^3			< 0.6 µg/m^3 from 0.000 mg to 0.100 mg/ m^3		
Permissible AAQ standard (CPCB) R			60 µg/ m^3			100 µg/m^3			80 µg/ m^3			80 µg/ m^3		
		I	60 µg/ m^3			100 µg/ m^3			80 µg/ m^3			80 µg/ m^3		
		S	60 µg/ m^3			100 µg/ m^3			80 µg/ m^3			80 µg/ m^3		
Monitoring Location	No. of Samples Drawn	Category* (R, I, S)	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile	Min.	Max.	98% tile
Mine site AQ5	24	I	28.5	38.0	37.8	63.1	79.8	78.9	BDL	6.1	6.0	11.7	19.5	18.9
AQ1	24	R	23.9	30.2	29.6	57.1	79.7	77.4	BDL	7.4	7.3	12.4	21.5	20.9
AQ2	24	R	31.1	43.2	41.5	63.3	79.2	77.9	BDL	6.5	6.3	16.1	21.5	20.6
AQ3	24	R	31.1	41.7	40.8	69.4	89.6	88.9	BDL	6.5	6.4	17.5	23.4	22.6
AQ4	24	R	33.5	41.5	40.5	67.9	85.4	84.8	BDL	6.3	6.2	15.2	20.8	20.5
AQ6	24	R	24.9	32.8	32.1	58.5	82.4	81.5	BDL	6.4	6.3	10.2	14.8	14.5

*R = Residential; I = Industrial; S = Sensitive

**Pb for mineral specific sites only.

Annex a location map indicating location of AAQ stations, their direction and distance with respect to project site.

(AAQ station location map is attached as Map No 4 in chapter III)

11

22. Stack and emission details, if any* **Not Applicable**

S. No.	Process / unit of operation (e.g. DG Set, Boiler)	Height of stack (m)	Internal top dia. (m)	Flue gas exit velocity (m/sec)	Emission rate (kg/hr)				Heat emission rate from top of stack (K.cal/hr)	Exhaust / Flue gas			
					SPM	SO_2	NO_x	CO		Temp ^oC	Density	Specific Heat	Volumetric flow rate (m^3/hr.)
-	-	-	-	-	-				-	-	-	-	-

23. Details of fugitive emissions during mining operations*

It is observed that the ground level concentration (GLC) decreases from **36.83 µg/m³** at **25 m** to **3.47 µg/m³** at **500 m** from the centre line of the road. These values have been predicted for a dry unpaved road in an uncontrolled scenario. However, the GLC at **25 m** will further reduce down to **9.57µg/m³** and **0.90 µg/m³** at **500 m** in a controlled scenario i.e. through water sprinkling.

24. Air Quality Impact Prediction (AQIP)* Details given in chapter IV (pg.no. 40-45).

(a) Details of model(s) used for AQIP including grid

size, terrain features, and input meteorological data

(b) Maximum incremental GLC values of pollutants based on prediction exercise

(in µg/m^3)

S. No.	Pollutants	Incremental Value	Ambient Air Quality	Resultant Air Quality
1.	SPM			
2**.	SO_2			
3**.	NO_X			

[* Question Number 22, 23 & 24 need not be filled-in for mines having ML area of **25 ha. or less.**]
[**Information on item no. 2 & 3 to be provided in cases with captive power generation of 500 KVA and above]

25. Water requirement (m^3/day)

Purpose	Avg. Demand	Peak Demand
A. Mine site		
1. Mine operation	-	-
2. Land reclamation	-	-
3. Dust suppression	3	3
4. Drinking	0.29	0.29
5. Green Belt	-	-
6. Beneficiation	-	-
7. Washeries	-	-
8. Fire Service	-	-
9. Others (Additional domestic purposes)	1.21	1.21
B. **Township**		
1. Green Belt	-	-
2. Domestic	-	-
C. Other (specify)	-	-
TOTAL	**4.5 m^3/day**	**4.5 m^3/day**

26. Source of water supply*

S. No.	Source	m^3/day
1	River (name)	-
2	Ground water	4.5 m^3/day from nearby village
3	Mine water (sump / pit)	-
4	Other surface water bodies (specify)	-

[*Annex a copy of sanction letter / permission from the concerned authority (Central Ground Water Authority in case of ground water abstraction is from notified area / State Ground Water Board in case of non-notified area / State Irrigation Department for surface water pumping) for drawing water.]

27	**Lean season flow in case of pumping from river / nalla (cumecs)**	**Not applicable**
28	**Ground water potential of the study area**	
28.1	**Ground water availability**	
a	Range of water table (m bgl)	**-**
i	Pre-monsoon (April/May)	
	Core Zone	3.5m bgl
	Buffer zone	3.5m bgl -58.0m bgl
ii	Post-monsoon (November)	
	Core Zone	3 m bgl
	Buffer zone	3m bgl -80.0m bgl
b	Total annual replenishable recharge (million m^3/ year)	
i	By ground water table fluctuation method	-
ii	By rainfall infiltration factor method	-
c	Annual draft excluding estimated draft through mine discharge (million m^3/ year)	-
d	Estimated draft through mine discharge (million m^3/ year)	-
e	Net annual ground water availability (million m^3/ year)	-
f	Stage of ground water development (%)	-

28.2 Water demand - Competing users of the water source

S. No.	Usage	Present Consumption (m^3/day)		Additional proposed as per local plan (m^3/day)		Total (m^3/day)	
		Surface	Ground	Surface	Ground	Surface	Ground
1	Domestic			-	1.5	-	1.5
2	Irrigation			-	-	-	-
3	Industry			-	-	-	-
4	Mining			-	-	-	-
5	Others (Dust suppression)			-	3	-	3
Total				**-**	**4.5**		**4.5**

29. Water quality*

(a) **Annex physico -chemical analysis of water at intake point ****

The details are given in chapter III (pg.no. 46-55).

[*For non-discharging mines at least four ground water samples to be taken preferably from downstream direction of the mine in pre-monsoon and post-monsoon periods and analysed. For discharging mines six samples are to be analysed]

(b) **In case of existing mine, annex report on quality of water discharge i.e. complete physico - chemical analysis****

Not Applicable

**All parameters as per BIS 10500. Indicate name of Methodology, Equipment used for analysis, and Detection Level (DL) for each parameter.
*** Wherever any analytical parameter is below detection level, "BDL" (Below Detection Level) should be written instead of 'NIL'.

30.	**Impact on ground water regime / stream / lake / springs due to mine dewatering ***	No dewatering has been proposed
a	Radius of influence (in m) [To be estimated based on analysis of pumping test data and application of empirical formula]	-
b	Whether saline water ingress will take place? (applicable to coastal areas)	-
c	Impact on stream / lake / springs	-

[* Provide a comprehensive hydro-geological assessment report if the average mine dewatering is more than 100 m^3/day and or going below water table in non-monsoon period. The report should be based on preferably latest one year pre-monsoon and post-monsoon baseline data covering information on ground water situation, aquifer characteristics, water level conditions (April – May and November), estimate of ground water resources, predicted impact of the project on ground water regime and detailed remedial / conservation measures such as artificial recharge of ground water etc. The report should be based on actual field inventory out of existing wells, at least 30 observation wells in the buffer zone with supplementary information from secondary sources (mention name). For estimation** of ground water resource (refer question no. 28 above) be designated study area of the buffer zone may be sub-divided into command and non-command areas, watershed-wise (in case of hard rock / consolidated formations) / block-wise / mandal-wise in case of alluvial / unconsolidated formations)]

[**For estimating ground water resources in the area follow the Ground Water Estimation Committee recommendations of 1997]

31.	**Waste Water Management**	Not Applicable
a	Daily average discharge (m^3/day) from different sources	
i	Mine water discharge during	
	Lean period	
	Monsoon period	
ii	Workshop	
iii	Domestic (mine site)	
iv	Beneficiation / Washeries	
v	Coal Handling Plant	
vi	Tailings pond	
vii	Others (Specify)	
	Total	
b	Waste water treatment plant; flow sheet for treatment process attached.	
c	Quantity of water recycled / reused / to be recycled in	
i	Percentage	
ii	m3 /day	
d	Point of final discharge	
	Final Point	Quantity discharged (in m^3/day)

1	Surface		
i	Agricultural land		
ii	Waste land		
iii	Forest land		
iv	Green belt		
2	River / nallah		
3	Lake		
4	Sea		
5	Others (specify)		
	Total		
e	Users of discharge water	**Yes**	**No**
i	Human		
ii	Livestock		
iii	Irrigation		
iv	Industry		
v	Others (specify)		
F	Details of the river / nalla, if final effluent is / will be discharged (cumecs)		
i	Average flow rate		
ii	Lean season flow rate		
iii	Aquatic life		
iv	Analysis of river water 100 meters upstream and 100 meters downstream of discharge point submitted.		
g	Township		
a	Waste water generation from township (m3/day)		
b	Are you planning to provide sewage treatment plant?		
c	Usage of treated water		

32. **Attach water balance statement in the form of a flow diagram indicating source (s), consumption (Section-wise) and output.**

Purpose	**Water Demand**
Domestic	1.5 KLD
Dust suppression	3 KLD
Total	**4.5 KLD**

33 **Ambient noise level leq dB(A)**

S. No.	**Location**	**Zone**	**Leq LIMIT (as per CPCB Guidelines), in dB(A)**		**Leq Value monitored, in dB(A)**	
			DAY*	**NIGHT***	**DAY***	**NIGH**
NQ1	Project site	Industrial Area	75	70	52.8	41.5
NQ2	Mahmudnagar	Residential Area	55	45	54.2	43.6
NQ3	Shishmbada	Residential Area	55	45	53.2	42.9

	NQ4	Tiparpur	Residential Area	55	45	52.3	40.9	

34	**Solid Waste**			**Not Applicable**
a	Top soil and Solid waste quantity and quality			
Name (Lump/fines/slurry/ Sludge/others)		Composition	Quantity (m^3/month)	Method of disposal
Mining activity*				
a. Top Soil				
b. Over burden				
c. Others (specify)				
Effluent Treatment Plant (sludge)				
Total				
[* Annex layout plan indicating the dump sites.]				
b (i)	Does waste (s) contain any hazardous/toxic substance/radioactive materials or heavy metals?			
(ii)	If yes, whether details and precautionary measures provided?			
c	Recovery and recycling possibilities.			
d	Possible user(s) of the solid waste.			
e (i)	Is the solid waste suitable for backfilling?			
(ii)	If yes, when do you propose to start backfilling?			

Solid waste (s)	Already accumulated (A)	To be generated (B)	% of A & B to be backfilled	
			A	B
Over burden				
Others (specify)				

Land reclamation Plan		**Not Applicable**
f	In case waste is to be dumped on the ground, indicate	
i	Associated environmental problems	
ii	Number & type of waste dumps	
	No. of external dumps	
	Max. projected height of dumps (in m)	
	No. of terraces and height of each stage	
	Overall slope of the dump (degree)	
	Proposed reclamation measures	
iii	Section of the waste dump in relation to the adjacent ground profile attached	
35	**Fuel / Energy requirements*** [*To be furnished for mines having ML area more t 25 ha. or captive power generation of 500KVA and above]	**Not Applicable**

a	Total power requirement			(in MW)	
S.		Mine Site	Township	Others	Total

No.				(specify)	
1	Present				
2	Proposed / additional				
Total					

b	Source of power		(in MW)
S. No.		SEB/Grid*	Captive power plant	DG Sets
1	Present			
2	Proposed / additional			
Total				

[* Annex a copy of the sanction letter from the concerned authority]

c	Details of fuels				
S.No.	Fuel	Daily Consumption (TPD)		Calorific value (Kcals/kg)	% Ash	% Sulphur
		Existing	Proposed			
1	HSD					
2	LSHS					
3	Other (specify)					

36	**Storage of inflammable / explosive materials**			**Not Applicable**
S. No.	Name	Number of Storages	Consumption (in TPD)	Maximum Quantity at any point of time
1	Fuels			
2	Explosives			

37	**Human Settlement**	
	Core Zone	Buffer Zone
Population*	-	Details given in Chapter III (pg.no. 77)
No. of villages	-	
Number of households village-wise	-	

[* As per 2001 census record or actual survey]

38.	**Rehabilitation & Resettlement (R&R) Plan*** [*Provide a comprehensive rehabilitation plan, if more than 1000 people are likely to be displaced, other-wise a summary plan]	**Not Applicable**
a	Villages falling within the study area	

Villages	Number	Name
Core zone		
500 m from the blasting site (s)		
Buffer zone		
Township site		

b	Details of village(s) in the core zone			
S. No.	Village name	Population*		Average Annual Income
		Tribal	Others	

1				
[*As per 2001 census / actual survey]				
c	Population to be displaced and / or Land Oustees			
Name of village(s) falling within		Number of oustees		
		Land (only)	Homestead (only)	Land and Homestead (both)
Mining Lease 1.				
Township Site 1.				

d	Whether R&R package has been finalized? If yes, salient features of R&R plan for oustees.				Not Applicable		
i	Site details where the people are proposed to be resettled & facilities existing / to be created.						
ii	Funds earmarked for compensation package						
iii	Agency /Authority responsible for their resettlement.						
iv	Time of commencement of resettlement of Project Affected People (PAP).						
v	Period by which resettlement of PAP will be over.						
39	**Lease -wise plantation details**				Not Applicable		
a	Lease area (in ha.)				Existing	Proposed	
	i. Area broken up				-	-	
	ii. To be broken up				-	-	
	iii. Area not to be broken-up				-	-	
b	Township area (in ha.)				-		
c	Area afforested and proposed (in ha.)				-		
		Peripheral	Dumps	Roads	Township	Others	
i	Existing						
ii	Proposed						
d	No. and type of trees planted and proposed						
i	Existing						
	When plantation was started?				Month / Year		
	No. of plant species planted				Number saplings (per ha.)		
	Survival rate %				Avg. height		
ii	Proposed						
	No. of plant species to be planted				**Number of saplings (per ha.)**		
	-				-		
40	**Environmental health and safety**						
a	What major health and safety hazards are anticipated?				None		
	What provisions have been made/proposed to be made to conform to health and safety				As per Mines Act/ Rules		

	requirements?	
	In case of an existing mine	
i	Comprehensive report on health status of the workers as under the Mines Act annexed	As per Mines Act/ Rules
ii	Mineralogical composition of RPM (dust)	
	• Free silica	2%
	• Chromium* (Total as well as Hexavalent)	Not applicable
	• Lead** [* Only for Chromite mines] [**Only for Base Metal mines]	Not applicable
	Information on radiation protection measures, if applicable	Not applicable

41. Environmental Management Plan

Salient features of environmental protection measures

S. No.	Environmental issues*	Already practiced, if applicable	Proposed
1	Air pollution	-	▪ Regular water sprinkling for dust suppression. ▪ Plantation activities along the roads to reduce the impact of dust in the nearby villages
2	Water pollution	-	▪ Mining will be done not beyond the ground water depth, to avoid Ground water pollution. ▪ Mining will not touch the water stream at any point of time. Hence no surface water pollution is expected
3.	Water conservation	-	No
4.	Noise pollution	-	▪ Well maintained vehicles will be used for transportation in order to reduce noise during movement of vehicles
5.	Solid waste / Tailings	-	Negligible amount of solid waste will be generated by workers, which will be disposed off through municipal way.
6.	Land degradation	-	No land degradation is expected
7.	Erosion & Sediment	-	The sediment excavated is replenished naturally.
8.	Top soil	-	No top soil is involved.
9.	Ground vibration	-	-
10.	Wildlife conservation	-	The wildlife within the study area will not be disturbed at all. And proper instruction will be given to the workers not to chase/hunt wild life.
11.	Forest protection	-	No forest land is involved in the lease area.
12.	Others	-	Short awareness program for labours to

			make them aware of way of working and various precautions to be taken will be conducted.

[* As applicable]

42	**Compliance with environmental safeguards (**For existing units)	**Yes**	**No**
a	Status of the compliance of conditions of Environmental clearance issued by MoEF, if any, enclosed.	-	√
b	Status of the compliance of 'Consent to Operate' issued by SPCB, if any, enclosed.	-	√
	Latest 'environmental statement' enclosed.	-	√
43	**Scoping of EIA**		
a	Whether environmental impact assessment of the project has been carried out by following scoping process?	Yes	
b	If yes, a copy of scoping of EIA annexed.	Details are given in chapter I (pg.no. 5-20)	
44	**Mine closure**		
a	Have you planned mine closure?	No	
b	Submitted a conceptual mine closure plan.	No	
c	If yes, indicate estimated amount for implementing the same (in Rs. lakhs)	No	
45	**Capital cost of the project (in Rs. Lakh) (Based on latest estimate)**	**Rs 16.30 lakhs**	

46. Cost of environmental protection measures (in Rs. Lakh)

S. No.	Environmental Protection Measures	Capital cost		Annual recurring cost	
		Existing	Proposed	Existing	Proposed
1	Pollution Control (Separately provide break-up)	-		-	2.4
2	Pollution Monitoring (Separately provide break-up)	-	-	-	2.2
3	Occupational Health	-	2.5	-	4.82
4	Green Belt • Mine • Township	-	1	-	0.36
5	Reclamation / Rehabilitation of mined out area	-	-	-	0.5
6	Others (wild life protection & road repairing)	-	1.5	-	0.15
Total		**-**	**5.0**	**-**	**10.43**

47	**Amount earmarked for socio-economic welfare measures for the nearby villages other than R&R plans.**	

48	**Public Hearing:** Details will be attached with the Final EIA Report		
a	Date of Advertisement	21-5-2014	
b	Newspapers in which the advertisement appeared	Times of India & Dainik Jagran	
c	Date of public hearing (DD/MM/YYYY)	16-07-2014	
d	Public Hearing Panel chaired by & members present	Chaired By – Sh. Pratap Singh Shah (A.D.M) Sh. Subhash Pawanr(SPCB) Sh. Sunil Dabral (SPCB)	
e	No. of people attended the public hearing meeting and number of people from the lease area.	Around 36 people attended the hearing. Around 5 people are there from GMVN	
f	Summary/details of public hearing in tabular form.	Details are attached as Annexure XII A & XII B	
49	**Whether the following approvals* (wherever applicable) have been obtained?**	**YES**	**NO**
a	Site clearance from MoEF	√	-
b	Consent for Establishment' from the State Pollution Control Board	-	√
c	NOC from Atomic Mineral Division	-	√
d	Mining plan approval from IBM / Ministry of Coal	-	√
e	In case of existing mines, mining scheme approval from IBM	-	√
f	Forestry clearance under FCA, 1980	-	√
g	NOC from Chief Controller of Explosives	-	√
h	Commitment regarding availability / pumping of water from the concerned Authorities	-	√
i	In case of ML area falling in notified areas of the Central Ground Water Authority, NOC from them.	-	√
	[* Annex copies of approvals and number them]		
50	**Was / is there any court case relating to the project or related activities? If so, provide details present status.**	No	

ANNEXURE V

Earthquake Data of Dehradun, Uttarakhand

S. No.	DATE	MAGNITUDE	EPICENTER
1.	20th February, 2005	3.5	45 km from Dehradun
2.	16th December, 2005	3.8	109 km from Dehradun
3.	22nd July, 2007	5.1	60 km from Dehradun
4.	16th August, 2008	3.8	24 km from Dehradun
5.	3rd May, 2010	4.0	28 km from Dehradun
6.	2nd October, 2010	4.0	30 km from Dehradun
7.	9th February, 2012	5.1	45 km from Dehradun
8.	23rd August, 2012	5.0	77 km from Dehradun

Copy of Environmental Policy - (Annexure - A1)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

E-Mail: gmvnl@gmvnl.com
gmvn@sancharnet.in
Ph :- 0135-2746817,2749308
Fax :- 2746847

Ref....811...../ Date 15/2/2014

Environmental Policy

We, Garhwal Mandal Vikas Nigam Ltd. (GMVN), Dehradun, applicant of the proposed project, reaffirm my commitment to contributing towards a clean and sustainable environment and continually enhancing our environmental performance as an integral part of our business philosophy and values.

Towards this commitment, I shall:

- Abide to the Uttarakhand Mineral Policy, 2011 and its amendment thereof and comply with all the conditions and stipulations.
- Ensure knowledge and consciousness about environmental issues among all employees in order to continually improve environmental impact and prevent pollution at source.
- Encourage, develop and apply the best available practicable technical solution.
- Communicate meaningfully with governments, civic leaders and other stakeholders, to develop a mutual understanding of environmental management issues and performance.
- Ensure that environmental management plans are integrated with day-to-day activities and safe work practices.
- Establish accountabilities for environmental protection accompanied by measurable objectives, targets and performance indicators.
- Plant trees & promote lush green surroundings in harmony with nature.
- Enhance environmental awareness amongst employees working and the general populace around working areas and mines.

- Report on our environmental management performance and progress regularly and appropriately to the concern authority.
- Involve the public in decision making and make this policy available to them.

WORKERS RESPONSIBILITY

All workers and contractors will be made to **comply with and support** the Environment Policy and to ensure that they:

- Follow established operational procedures, guidelines and instructions.
- Report and respond to environmental incidents and hazards in a timely fashion.
- Abide by the applicable laws and regulations of the mineral policy.
- Evaluate and respond to risks related to the mining activity which could adversely impact people or the environment.
- Ask questions of their supervisor when unsure about environmental issues to comply/ ensure them

(Authorized Signatory)

(Managing Director)

For Garhwal Mandal Vikas Nigam Ltd.

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

E-Mail: gmvnl@gmvnl.com
gmvn@sancharnet.in

Ph :- 0135-2746817,2749308
Fax :- 2746847

Ref.....432 / GMVN

Date: 11.9.2014

To,

The Chief Wildlife Warden,
Government of Uttarakhand,
Wild life Institute 5, Chandrabhani,
Mohabewala, Dehradun-248001

Subject: Authentication of the data for proposed sites- River Aasan Lot no. 14/5, 14/6, 14/8, 14/9 and 14/10 at District: Dehradun, State: Uttarakhand by Garhwal Mandal Vikas Nigam for river bed mining in the allotted area.

This is for your kind information that the above mentioned project for mining of Boulder, Bajri, and Sand lies in **Dehradun** district, State **Uttarakhand** has been applied for Environmental Clearance, for which relevant information of the study area is required to be authenticated:

- ✓ Aasan Conservation Reserve within 10km of the study area of the project site.

The details are given as below:

S.No	Project Site	Distance (in km)	Direction
1	River Aasan Lot No.-14/5	8	NW
2	River Aasan Lot No.-14/6	9	NW
3	River Aasan Lot No.-14/8	5.5	NW
4	River Aasan Lot No.-14/9	3.5	NW
5	River Aasan Lot No.-14/10	0.25	NW

- ✓ List of Flora & Fauna present in the study area (Enclosed).

Kindly authenticate the above information at your earliest for the finalization and submission of EIA/EMP report to the regulatory bodies for obtaining Environmental Clearance.

Thanking you.

Yours truly,

Managing Director

अनापत्ति प्रमाण पत्र

प्रमाणित किया जाता है कि गढ़वाल मंड़ल विकास निगम उत्तराखण्ड़ का रेत, बजरी एंव बोल्डर खनन पट्टा **आसन** नदी तल के क्षेत्र मे ग्राम **सहसपुर**, तहसील **विकासनगर** ज़िला **देहरादून** उत्तराखण्ड़ में स्थित है। इस खनन क्षेत्र में धूल नियंत्रण के लिये पानी का छिड़काव और पीने के लिए उपयोग में लाए जाने वाला पानी की कुल मात्रा **4.5 कि0ली0/दिन** की आपूर्ति ग्राम पंचायत के अधिकार क्षेत्र में स्थित पानी के स्रोत में से किए जाने पर पंचायत समिति को कोई आपत्ति नहीं है।

स्थान:..सहसपुर.....

दिनांक:.....24/10/15.

हस्ताक्षर

(ग्रम प्रधान)

No. 101 / CCEFI / 2015 / GMVN / 4567

Climate Change and Forest Influence division

Forest Research Institute

P.O. New Forest- Dehradun

To

The Managing Director (Mining)
Garhwal Mandal Vikas Nigam (GMVN),
Dehradun- 248006 (Uttarakhand)

Sub: Submission of project proposal: Reg.

Ref. No. 516/ Mining, Dated 02.12.2015

Sir,

With reference to the above cited subject, we are submitting herewith the project proposal entitled "Replenishment study of River bed material of Uttarakhand (Phase- I) to carry out the activities/study mentioned in your letter. The estimated budget will be Rs 24.88 lakh (twenty four lakh and eighty eight thousand). This is for your kind information and perusal please.

Yours faithfully

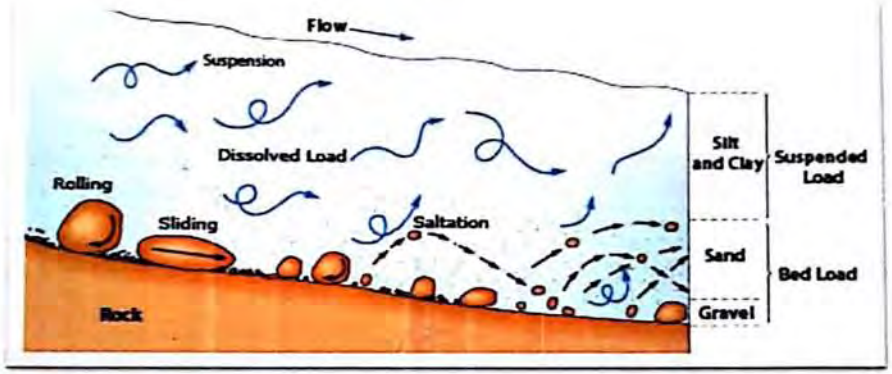
28/12/2015

(Dr. Parmanand Kumar)

Dr. Parmanand Kumar
Scientist B
Climate Change & Forest Influence Division
Forest Research Institute,
Dehradun (UK) - 248006

PROJECT PROPOSAL

REPLENISHMENT STUDY OF RIVER BED MATERIAL OF UTTARAKHAND (PHASE I)



Submitted to

GARHWAL MANDAL VIKAS NIGAM (GMVN)

74/1, RAJPUR ROAD, DEHARADUN

Prepared & Submitted

By

Climate Change & Forest Influence Division

Forest Research Institute, Dehradun

GENERAL INFORMATION

1.	**Project Title**	: Replenishment study of river bed material of Uttarakhand (Phase I)
2.	**Name of the Institute**	: Forest Research Institute, Dehradun
4.	**Designation of the Executive Authority of the Institute forwarding the application**	: Director, Forest Research Institute, Dehradun
7.	**Duration**	: 1 year and 3 Months (from beginning of the project)
8.	**Total Cost (Rs.)**	: 24.88 lakh
9.	**Name & Designation of Principle Investigator**	: Dr. Parmanand Kumar, Scientist-B, FRI, Dehradun
10.	**Name and Designation of Co-Principal Investigator**	Dr Arvind Kumar, Scientist-D, FRI, Dehradun Dr. Hukum Singh, Research Officer, FRI, Dehradun
11.	**Project Coordinator**	: Head, Climate Change & Forest Influence Division Forest Research institute, Dehradun
12.	**Address**	: Climate Change & Forest Influence Division Forest Research institute, P.O. New Forest, Dehradun- 246008 Email : head_ccfi@icfre.org Phone : 0135-2224332

Project Summary and Objective

The bed/sediment load of a river commonly considered to be a pollutant that is aesthetically displeasing and environmentally degrading. Conversely, part of the sediment load (sand and gravel) may represent a natural resource for use by society. The potential usefulness of the sediment load is enhanced when it is composed of particle sizes found in deposits on the riverbed that would be replenished by newly transported sediment after mining. As such, river deposits become renewable resources, periodically replaced by sediment transport in the river. Many factors such as topography, soil type, bedrock type, climate and vegetation cover influence input, output and transport of sediment and water in a drainage basin (Charlton, 2008). These factors also influence the natural pattern of water bodies (Twidale, 2004). As a consequence, drainage pattern can reflect geographical characteristics of a rivers network to a certain extent. There are several types of drainage pattern. At present, much research has been done on the description of drainage patterns in geography and hydrology (e.g. Howard, 1967; Lambert, 1998; Twidale, 2004; Pidwirny, 2006). Sediment transport knowledge is important in river restoration, ecosystem protection, navigation, watershed studies and reservoir management. Bed load represents the lower portion of sediment load in natural rivers.

Fluvial sediment load materials are transported by rivers. Sediment load can be divided into bed load and suspended load based on the mode of transport. Bed load is transported close to the bed where particles moved by rolling, sliding, or jumping (Adegbola, 2012). Xlaoqing (2003) explained that bed load transport in natural rivers is a complicated phenomenon. Its movement is quite uneven in both the transverse and longitudinal directions, which vary considerably.

The state of Uttarakhand has great importance in the local, regional, national and international perspectives due to its distinct physiographic conditions i.e. Himalayas, Shivalik and planes having altitudinal variation ranging from 300 to 3500 meters. It is endowed with diverse vegetation types, ranging from tropical to subtropical, temperate and alpine including riverine, grasslands and wetlands. The state has 64.79% of its total geographical area as forest area against India's forest and tree cover of 23.4% of the total geographical area. Many rivers are generated from Himalyan and Shivalik regions which supply water in down streams. The rivers of the Uttarakhand play an important role for the nation by providing water required by various sectors such as irrigation, drinking, recreation and industrial requirements etc. Besides, mining activities are also being carried out in the rivers for the developmental process.

Di-siltation (removal of excess sand and stone from river bed) of the river helps to maintain the carrying capacity and provides protection from flooding during monsoon season. Further, continuous flow of river is essential for ecological and economic needs such as irrigation and biodiversity etc. Therefore, replenishment study of the river helps to understand potential carrying capacity of water during monsoon season which is generated from rainfall in the watershed and quantity of di-siltation of rivers under mining affected areas. Additionally, Grain/particle size distribution analysis of bed load samples must be done to define the size composition of the material in transit.

The objectives of the proposed study are:

1. To estimate the area of river's lots by linear survey at different sections of rivers.
2. To measure the grain size distribution of river bed materials.
3. To study the replenishment behavior of the rivers by morphometric analysis of river's watershed with the help of Arc GIS.

Methodology:

1. Location and Description of Study: The replenishment study, locations and description study of twenty lots of river's in Dehra Doon district will be carried out as detailed below:

Details of river's lots to be taken under replenishment study

Sl.No.	Name of the Lot	Area (ha)	Name of the River
1	Tons 3/8	15.363	Tons River
2	Tons 3/10	23.000	
3	Tons 3/11	11.100	
4	Tons 3/13	6.000	
5	Tons 3/14	6.700	
6	Non 8/1	7.500	Non River
7	Non 8/2	7.600	
8	Asan 14/1	18.400	Asan River
9	Asan 14/2	21.094	
10	Asan 14/4	35.405	
11	Asan 14/6	32.709	
12	Asan 14/8	32.000	
13	Asan 14/9	45.000	
14	Asan 14/10	62.000	
15	Jakhan 13/2	92.652	Jakhan River
16	Jakhan 13/1	18.000	
17	Yamuna 23/3	14.970	
18	Song 7/2	135.856	
19	Suman nagar	10.350	Pathri Row
20	Garhroshnabad	11.883	

1. **Study variables:**
    1. Liner Survey at different section of rivers
    2. Grain Size distribution study
    3. Mapping of river's lots by Arch GIS
    4. Morphometric analysis
    5. Catchment area and land uses

2. **Acreage Survey:**

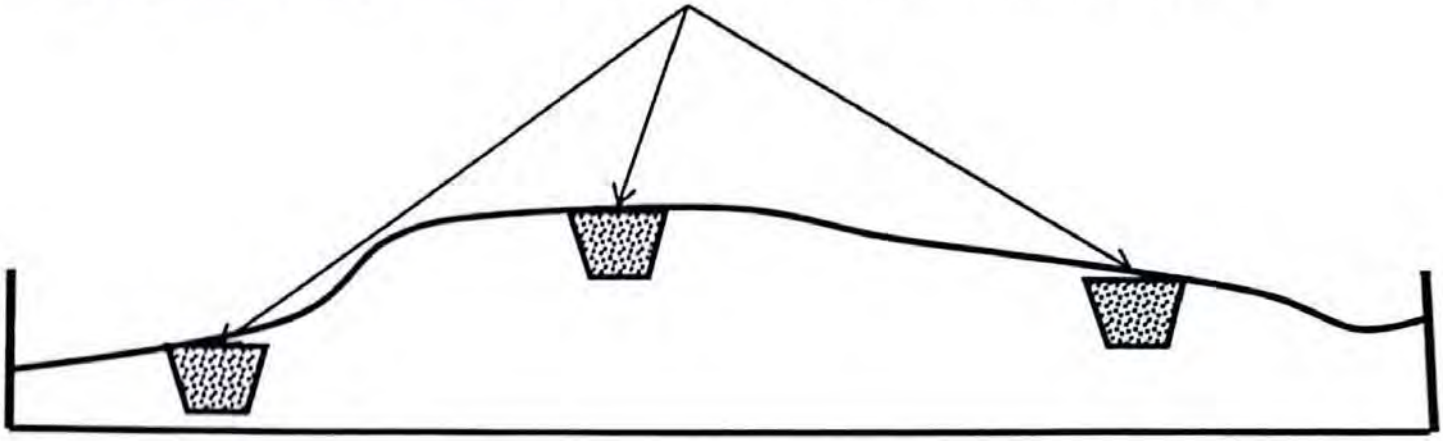
The area of the proposed river lots will be measured by linear survey and through GPS coordinates with the help of ArcGIS approach. The catchment area of the river will be analyzed with the help of ArcGIS approach. The stretch of the mined area of river will be divided in various segments depending on stretch of the rivers. The width (meters) and GPS coordinates at each segment will be collected to quantify the total mined area of river. The geo-morphological patterns in terms of stream flow orders will also be observed using Arc GIS methodology.

3. **Grain Size Distribution Analysis in Rivers:**

The area of the proposed river will be divided in to various segments (figure A) to analyze grain size distribution in river bed. Pits with size of 2m × 1m × 1m (figure 1) per segment will be made throughout the stretch of the river with digging methods. The samples will be collected from two depths of the river beds i.e. above 50 cm and below 50 cm of the river bed. The dug material from each depth will be filled in iron bucket with 50 kg capacity and weigh with the help of weighing balance. Subsequently, the weighted material will be screened through various grades of sieves (fig 2). Again, the screened material of various sizes sieved will be weighed to calculate actual percentage of grain size at both depths.

Grain size distribution in the river bed will be measured with the help of different opening size of the screens up to 1 m depth at different locations of the river.

Sapling site for analysis grain size distribution throughout stretch of the river



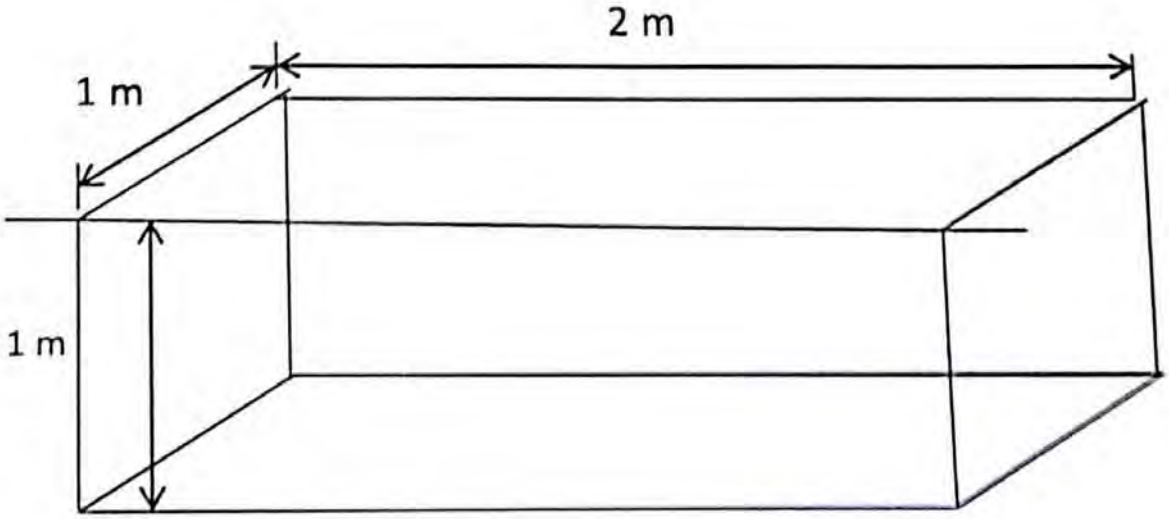


Fig 1: Sampling site and pit size for study of grain size distribution

On the basis of grain size distribution the selection of sieves of four different sizes will be taken for observing the grain size of river bed materials (RBM). Five different opening sizes i.e. <2mm, 2-6mm, 6-10mm, 10-35mm, >35mm of sieves shows in fig 2 will be used to observe RBM fraction percentage and make basis for execution of RBM.

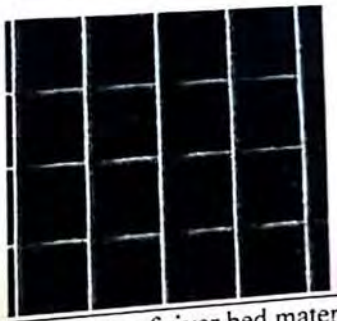
Specification of Sieves	Sieves Type
<2mm	
2-6mm	
6-10mm	
10-35 mm	
>35 mm	

Fig 2: Different screen openings use in grain size distribution of river bed material.

Work plan:

Project Activities	Quarter I	Quarter II	Quarter III	Quarter IV	Quarter V
Recruitment of the project staff					
Sites survey and data collection					
Purchasing of equipment and other experiment relevant materials					
Map generation and analysis of rivers					
Data analysis, interpretation and compilation of report					

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Xlaoqing, Y., 2003. Manual on Sediment Management and Measurement.Operational Hydrological Report No 47.WMO-948, Secretariat of the World Meteorological Organization-GenevaSwitzerland.

Declaration

This is to certify that

The work is being proposed on the request of GMVN for the replenishment study of 20 lots of Uttarakhand river's (Phase-I).

The proposed budget for this study is Rs. 24.88 Lakh under following major heads

- Salary of contractual staff Rs. 8.16 lakh,
- Other expenses Rs. 12.57 lakh
- Institutional charges Rs. 4.15 lakh

The institute agrees that the equipment, other basic facilities and such other administrative facilities will be extended to investigator(s) throughout the duration of the project.

The Institute administration assumes to undertake the financial and other management responsibilities of the project.

08/12/2015

Signature of Co-Investigator
(Dr Hukum Singh)

8/12/15

Signature of Co-Investigator
(Dr Arvind Kumar)

8/12/2015

Signature of PI
(Dr Parmanand Kumar)

08/12

Signature Project Coordinator
Head, CC&FI Division
Forest Research institute, Dehradun

Signature of Head of the Institution with seal

CUMMULATIVE STUDY REPORT

Cumulative Traffic study:

Traffic study is carried out by understanding the existing carrying capacity of the road in the vicinity of site and flow towards bypass Road in the area. Then depending on the capacity of the mine, the number of trucks that will be added to the present scenario will be compared to the carrying capacity as recommended by Indian Road Congress (IRC). The existing volume of traffic and, the Level of Service are given in **Table-below**:

(i) Existing Traffic Scenario & LOS

Road	V (PCU/day)	C (PCU/day)	Existing V/C Ratio	LOS
Shimla bypass Road	1200	10000	0.12	A

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

The existing Level of Service at highway is "A" i.e. excellent when compared with LOS recommended by IRC, as given in

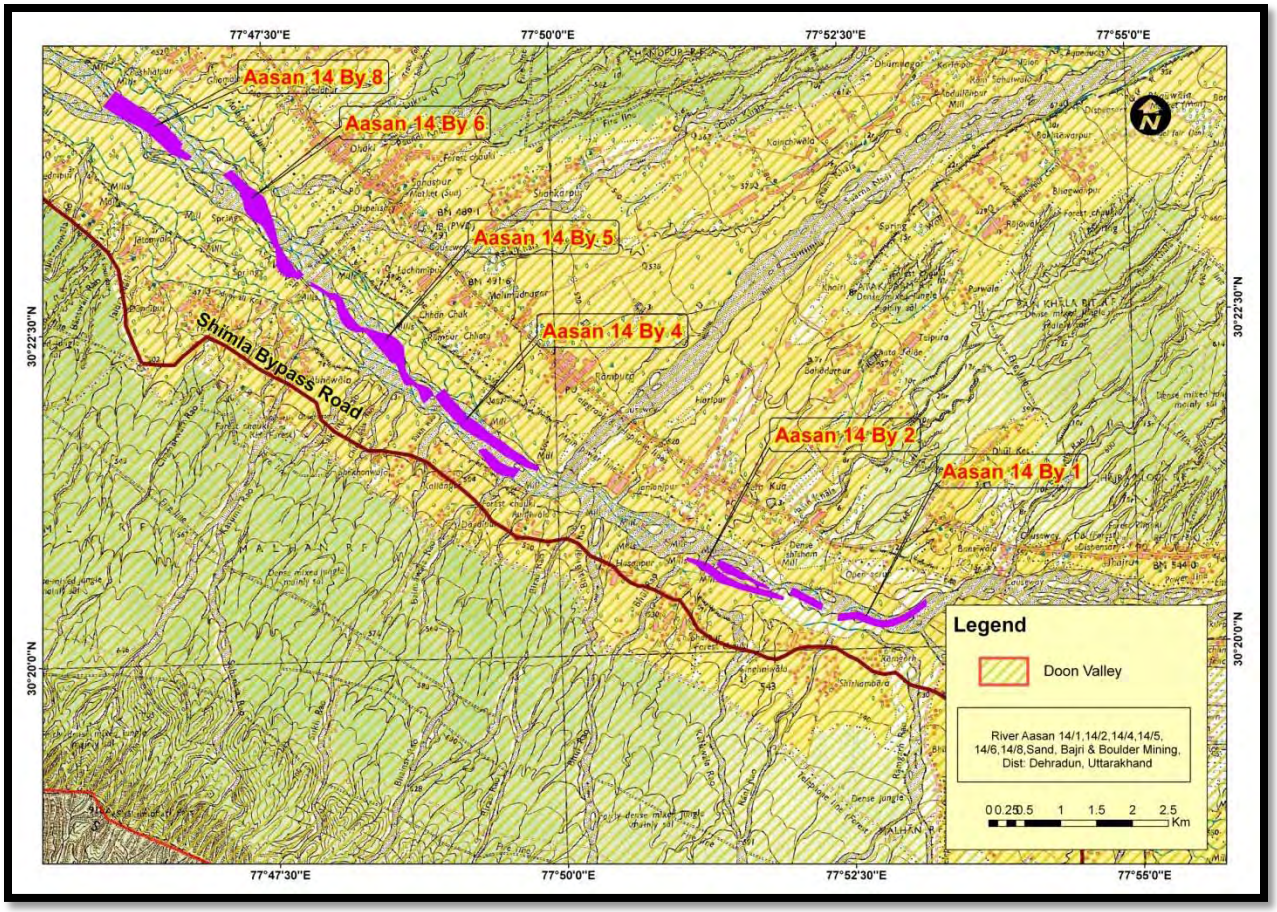
Table of LOS

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

Note: Capacity as per IRC: 64-1990

The entire lot of mines mentioned below is transporting the excavated minerals via **Shimla Bypass road.**

Below is the detailed impact of the cumulative trucks plying on Shimla bypass road.



During Mine operation from Aasan 14 by 1 Mine

Proposed Capacity of mine/annum : 1,60,000 TPA

No. of working days : 225 days

Proposed Capacity of mine/day : 711 TPD

Truck Capacity : 10 tonnes

No. of trucks deployed/day : 71

During Mine operation from Aasan 14 by 2 Mine

Proposed Capacity of mine/annum : 2,00,000 TPA

No. of working days : 225 days

Proposed Capacity of mine/day : 888 TPD

Truck Capacity : 10 tonnes

No. of trucks deployed/day : 88

During Mine operation from Aasan 14 by 4 Mine

Proposed Capacity of mine/annum : 3,40,000 TPA
No. of working days : 225 days
Proposed Capacity of mine/day : 1511 TPD
Truck Capacity : 10 tonnes
No. of trucks deployed/day : 151

During Mine operation from Aasan 14 by 5 Mine

Proposed Capacity of mine/annum : 2,50,000 TPA
No. of working days : 225 days
Proposed Capacity of mine/day : 1111 TPD
Truck Capacity : 10 tonnes
No. of trucks deployed/day : 111

During Mine operation from Aasan 14 by 6 Mine

Proposed Capacity of mine/annum : 2,50,000 TPA
No. of working days : 225 days
Proposed Capacity of mine/day : 1111 TPD
Truck Capacity : 10 tonnes
No. of trucks deployed/day : 111

During Mine operation from Aasan 14 by 8 Mine

Proposed Capacity of mine/annum : 3, 00,000 TPA
No. of working days : 225 days
Proposed Capacity of mine/day : 1334 TPD
Truck Capacity : 10 tonnes
No. of trucks deployed/day : 134

No. of trucks/day by the proposed and nearby mines- Aasan 14 by 1,2,4,5,6,8 = (71+88+151+111+111+134) = 666 trucks per day

No. of trucks/days (Both ways) : 666*2= 1332

No. of PCU added/day-both ways : 1332 x 3 = 3996

Increase in PCU/day : 3996

The addition to traffic by the proposed project during its operation is given below

Additional Traffic Scenario & LOS

Road	V (PCU/day)	C (PCU/day)	Modified V/C Ratio	LOS
Shimla bypass Road	1200+3996=5196	10000	0.51	C

From the above analysis it can be seen that the V/C ratio will change to 0.51 from 0.12 with LOS being "C" which is "Good" at Shimla Bypass intersection, as per classification.

DISASTER MANAGEMENT PLAN

River Bed Mining has impending dangers or risk which need be addressed for which a disaster management plan has been formulated with an aim of taking precautionary steps to avert disasters and also to take such action after the disaster which limits the damage to the minimum. As per proposal made under the mining plan, during proposed working, the area will be developed by means of semi-mechanized opencast mining method.

- *Possible Risks Due To Inundation & Its Control*

Mining will be done during the non-monsoon periods; therefore problem of inundation is not likely to happen. However, sudden uninformed release of water from upstream reservoirs, if any, or during dam bursts cannot be ruled out

- *Dewatering*

Depth of mine is limited to 3m depth or ground water level, whichever comes first. Hence no dewatering is required.

- *Possible Risks Due To Failure of Pit Slope & Its Control*

Pit will be created of limited depth only i.e. 3m with bench heights not exceeding 1m and a slope of 45^0. Thus the chance of failure of pit slope does not exist.

- *Possible Risks Due To Failure of Waste Dump & Its Control*

No waste dump is created therefore the question of failure of waste dump does not exist.

- *Possible Risks Due To Explosion, Fire & Its Control*

The operation does not need blasting and electricity and hence does not anticipate any fire disaster.

- *Measures to Prevent Accidents Due to Trucks/Dumpers*

i. All transportation within applied mining lease working shall be carried out directly under the supervision and control of the management.

ii. The vehicles will be maintained in good condition and checked thoroughly and vehicles without fitness certificate or PUC Certificate will not be allowed. In case of doubt, vehicles will be inspected by a competent person authorized for the purpose by the management.

iii. Road signs will be provided along the evacuation route showing maximum speed limit, school sites, market places, hospital sites or any other sites where crowds are anticipated en route and at each and every turning point up to the main road (wherever required).

iv. To avoid danger while reversing the equipment's/ vehicles especially at the working place / loading points, stopper shall be posted to properly guide reversing/ spotting operating, otherwise no person shall be allowed within 10 m radius of machine except operators.

v. A statutory provision of the fences around deep pits, warning signs near quick sand conditions, constant education, training etc. about risk and hazards expected from the project shall be provided for reducing the incidents of such accidents.

❖ **Other Possible Measures to Avoid Risks/ Disaster Due to River Bed Mining.**

i. Unwanted material including mineral or spillage (if any) shall not be stacked on the banks as it will hinder the flow of water in monsoon season causing water logging and damaging evacuation routes and nearby structures.

ii. Mining of minerals / working shall be started from the center line of lease area starting from dip to rise to avoid ponding and then laterally in 3 numbers of 1 meter high benches to avoid side collapsing.

iii. River banks will not be excavated to from access ramps.

iv. Only excavated and unsalable river gravel shall be used to deposit against the river bank to form access ramps with allowable slope.

Maintenance and monitoring of housekeeping:

The area will be monitored every week by competent person and if maintenance is needed will be done as per requirement.

❖ Occupational Health Hazards:

Dry- pit mining by open cast method involves dust generation by excavation, loading and transportation of mineral. At site, during excavation and loading activity, dust is main pollutant which affects the health of workers whereas environmental and climatic conditions also generate the health problems.

Addressing the occupational health hazard means gaining an understanding of the source (its location and magnitude or concentration), identifying an exposure pathway (e.g. a means to get it

in contact with someone), and determination of likely a receptor (someone receiving the stuff that is migrating).

Occupational hazard due to sand mining mainly comes under the physical hazards.

- ***Physical Hazards due to Mining Operations:***

Following health related hazards were indentified due to riverbed sand mining operations to the workers:-

1. Light: - The workers may be exposed to the risk of poor illumination during evening hours or excessive brightness during day times. The effects are eye strain, headache, eye pain and lachrymation, congestion around the cornea and eye fatigue.

2. Heat and Humidity: - The most common physical hazard is heat as working is done in open sun light without any shed. The direct effects of excessive heat exposure in summer season areas are burns, heat exhaustion, heat stroke and heat cramps; the indirect effects are decreased efficiency, increased fatigue and enhanced accident rates. Heat and humidity are encountered in hot and humid condition when temperatures and air temperatures may exceed 48^0C in the river bed mining area.

3. Eye Irritation: - During the high windy days in summer the sandstorms could be the problems for eyes like itching and watering of eyes.

4. Respiratory Problems: - Large amounts of dust in air with possibility to have free crystalline quartz can be a health hazard, exacerbating respiratory disorders such as asthma and irritating the lungs and bronchial passages. However, as the sand at river beds are having high moisture, the emission from excavation and loading are not significant and in case of dry sand, this can be easily controlled by water sprinkling.

5. Noise Induced Hearing Loss: - Vehicles and Machinery is the main source of noise pollution at the mine site, though they are not significant

6. Insect and snake bites are possible as their habitations below boulders may be disturbed during mining.

7. Approaching areas having quick sand conditions unknowingly.

❖ **Medical Examination Schedule:**

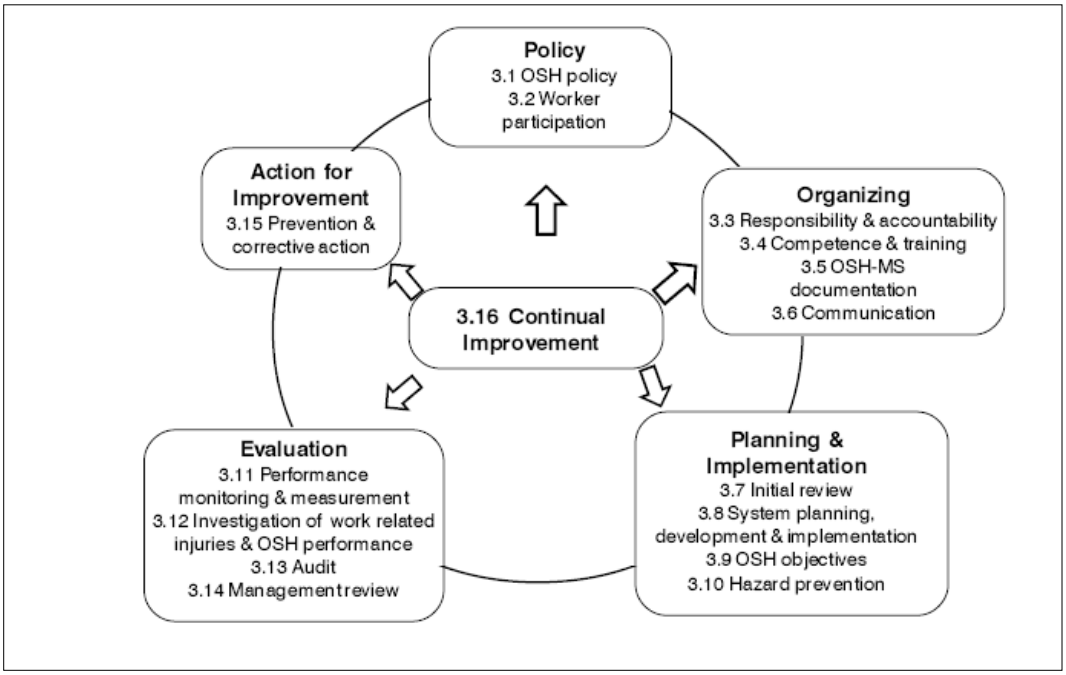
To minimize the health impacts PPE like dust masks, ear plugs/ muffs, goggles for protection against sunlight and other equipments will be provided for use by the work personnel. Rest

shelters shall be available at site to take rest during excessive heat with drinking water facilities to reduce impacts due to exposure to heat and body water loss. All workers will be subjected to Initial Medical Examination as per Mines Rule 1955 at the time of appointment. Periodical Medical Examination will be conducted at least once in a year. Immediate action will be taken if any worker is found to exhibit signs of heat stroke or dehydration or snake bites etc. by shifting him to a nearby hospital and signing a contract with them.
Medical camps will be organized. Periodical medical examination will also be scheduled.

Safety in the workplace is critical to the success of running a business, no matter what size it is. As a small business owner one has certain rights and responsibilities regarding health and safety in the workplace. Even without any employees, one must ensure that the business doesn't create health and safety problems for the customers and the general public.

All safety gears will be provided to workers and care will be taken by the management that these are used properly by them. All safety norms will be followed.

The management, however small it may be, will form a policy and methods to execute them as below:



Major Hazards:

Flash Floods:

As the project site is itself a river bed which is prone to face flash floods in case of excessive rains upstream, opening of dam gates, dam burst etc., if the workers remain uninformed, they may be severly affected leading to wash away in the stream.

Quick Sand Conditions;

There may be possibilities of areas having quick sand conditions near the site where workers or domestic cattle may reach accidently and get trapped**.**

Insect and Snake Bites:

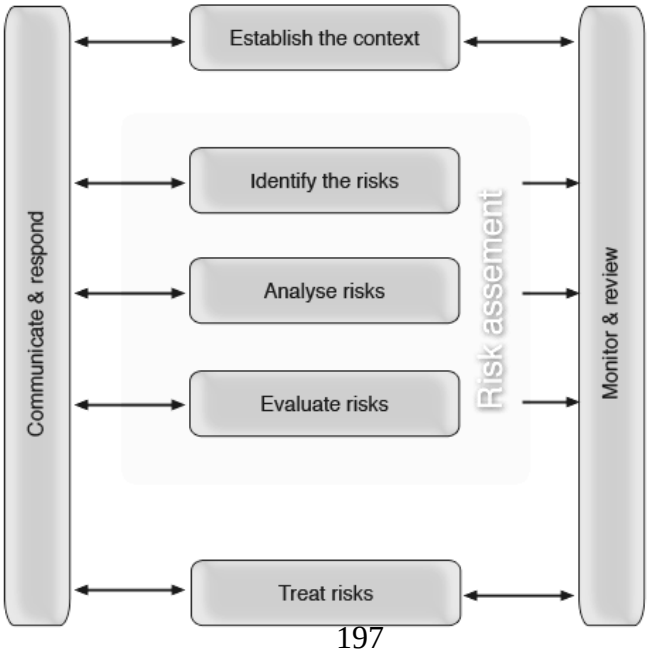
During working, there may be possibilities of insect and snake bites.

Fire and Explosions: The mining machineries use diesel and these may be stored at site. The fuel oil storage areas may face fire and explosion problems if the Hazardous Materials Act is not complied with.

Fall in pits:

The entire work area is unprotected river bed. The levels are not uniform having pits and slopes. There are every possibility of workers, visitors and stray cattle to fall in pits. Complete fencing of pits is also not practicable.

The entire OHS system will be designed as follows:



Personal Protective Equipment (PPE)

General Provisions

As a supplementary protection against exposure to hazardous conditions in the RBM projects where the safety of workers cannot be ensured by other means, such as eliminating the hazard, controlling the risk at source or minimizing the risk, suitable and sufficient PPE, having regard to the type of work and risks, and in consultation with workers and their representatives, shall be procured and used by the workers and provided and maintained by the employer, without cost to the workers. PE)

- PPE shall be examined periodically to ensure that it is in good condition.
- Different PPE & their components shall be compatible with each other when worn together.
- It shall be ensured that the procured PPEs are ergonomically designed and, to the extent practicable, should not restrict the user's mobility or field of vision, hearing or other sensory functions.
- Employer shall ensure that the workers who are required to wear PPE are fully informed of the requirements and of the reasons for them, and are given adequate training in the selection, wearing, maintenance and storage of this equipment.
- When workers have been informed accordingly, they shall use the equipment provided throughout the time they may be exposed to the risk that requires the use of PPE for protection.
- The PPE shall not be used for longer than the time indicated by the manufacturer.
- Workers shall make proper use of the PPE provided, and maintain it in good condition, consistent with their training and be provided with the proper means for doing so.
- PPE procured shall not contain hazardous substances, such as asbestos.

Head Protection

- Helmets intended for use in industry shall be subjected to a test for resistance to falling objects while loading.
- Any helmet that has been submitted to a heavy blow, even if there are no evident signs of damage, shall be discarded.
- Helmets for persons working overhead shall be so procured that they shall be provided with chin straps.
- In addition to safety, consideration shall also be given to the physiological aspects of comfort for the wearer.
- The helmets shall be so procured that they shall be as light as possible, the harness should be flexible and should not irritate or injure the wearer and a sweatband should be incorporated.
- All protective headgear shall be cleaned and checked regularly.

Face & Eye Protection

- Face shields or eye protectors shall be used to protect against flying particles and dust storms.
- Goggles, helmets or shields that give maximum eye protection shall be worn by operators and their helpers.
- The protectors shall be fitted and adjusted by a person who has received training in this task.

Respiratory Protective Equipment

- When effective engineering controls are not feasible, or while they are being implemented or evaluated, masks, appropriate to the hazard and risk in question, shall be used to protect the health of the worker working in dusty conditions.

Hearing Protection

Noise pollution is not a major issue in the project. However, the following measures shall be taken if anybody is to work in a noisy area:

- When effective engineering controls are not feasible or while they are being implemented or evaluated, hearing protection shall be used to protect the health of workers.
- Hearing loss of speech frequencies may occur with elevated long-term exposure to noise. The use of hearing protectors gives the best results to users who are well informed of the risks and trained in their use. If earplugs are used, special attention shall be paid to the proper fitting technique.
- Hearing protectors shall be so procured that they are comfortable, and the users shall be trained to use them properly. Special attention shall be paid to possible increased risk of accidents due to the use of hearing protectors. Earmuffs reduce the capacity to locate sound sources and prevent warning signals from being heard. This is especially true for workers with considerable hearing loss.

Protection from Falls

- In RBM projects, workers are exposed to working at uneven sites with pits and slopes not properly designed.
- Devices like fencings and warning signboards shall be provided to prevent workers from falling to the extent possible.
- Appropriate and timely rescue shall be provided when using fall-arrest equipment to prevent suspension trauma.

Plan of evaluation of health of workers

- By pre designed format during pre placement and periodical examinations.
- Proper schedule will be devised and followed with help of occupational health experts and doctors.

Schedule of medical check-up during operational phase

- Comprehensive Pre-employment medical checkup for all employees
- General check up of all employees once every year.
- Local hospitals and Govt. health monitoring system will be engaged.
- Dispensary and ESI facility will be provided to all workers as applicable
- All safety gears will be provided to workers and care will be taken by the management that these are used properly by them. All safety norms will be followed

Disaster Management Plan

❖ ***Introduction***

Even with all precautions, disasters may take place. As such, an Emergency Plan has been formulated to take care of any disaster in the project and surrounding areas and is detailed as under:

In order to prevent occurrence of any disaster, the project will be provided with various safety measures as described. However, in case of failure of safety measures or due to natural calamity or sabotage, disaster may happen. Therefore, it is necessary to provide disaster control facilities to minimize losses due to disaster. Normally, in the project, no major disaster affecting nearby population areas are foreseen. However, accidents inside the project affecting workplace in vicinity cannot be ruled out.

➢ ***Definition of disasters***

A situation will be called a `Disaster' if it entails any one or more of the following factors:

- Risks of loss of human lives - ten or more in one single situation.

- Loss of property as a consequence of the incident is over Rs.1 Crore and/or bears a potential to the above.
- A situation which goes beyond the control of the available resource of the project.
- A situation apparently may not have much loss but its long-term severity can affect loss of life, production and property.

The types of possible disaster are given below:

➢ ***Type of disasters***

i) Disaster due to failure of safety measures on account of:
- Fire and explosion
- Toxic gas release
- Pressure wave transmission due to blasting or explosion
- Collapse of mine wall and dump slope
- Accidents due to mining equipment and trucks/dumpers

ii) Disaster due to natural calamity on account of:
- Flood
- Earth quake / cyclone / Storm / Cloud burst / Lightning

iii) Disaster due to external factors on account of:
- Food poisoning / Water poisoning
- Sabotage
- Quick sand conditions

❖ **Objectives**

Objectives of the disaster control/management plan for the proposed project are:

1. To identify type of major disasters this may occur in the project.
2. To collect data on type of disasters which has happened already in other RBM projects.
3. An action plan to handle disaster.

1. Identification of Hazardous Process/Area

Level of Accident

If there is any disaster in any part of the project /work place due to any reason, the area which may be affected can be classified in the following four classes.

1. Level I - Operator level
2. Level II - Local/community level
3. Level III - Regional/ national level
4. Level IV - International level

Level I class of accidents have been considered for the project.

Level I

Under this level, disasters may happen due to fire and explosion, accidents due to traffic, falls on uneven areas and pits, toxic gas release, pressure wave transmission due to blasting or explosion, flash floods, inundation, cyclones, cloud burst, quick sand conditions and earthquake. This level has probability of occurrence affecting persons inside the project site-may be workers or any visitor including stray animals who have strayed into the site as the site has no protective boundary of its own due to its nature unlike an industrial plant. Moreover, as the project has no source of fire, explosion, toxic gas release or pressure wave transmission due to blasting, the effect will not reach nearby community.

- ***Major Hazards and their Control:***

Flash Floods:

As the project site is itself a river bed which is prone to face flash floods in case of excessive rains upstream, opening of dam gates, dam burst etc., if the workers remain uninformed, they may be severly affected leading to wash away in the stream.

Inundation

Mining will be done during the non-monsoon periods; therefore problem of inundation is not likely to happen. However, sudden uninformed release of water from upstream reservoirs, if any, or during dam bursts cannot be ruled out

Alarm System – an effective control system:

In case of RBM projects, where maximum chances of disaster are due to flash floods and inundation due to anthropogenic or natural activities up stream, a proper communication and alarm system is the first requirement. The alarm system can be activated only if the Safety Officer is communicated the same from upstream sources on time. There is a time lag between the occurrence of the situation at source and it's reaching the site, which are some distance away. If the source is due to anthropogenic reasons, the information must be communicated to downstream areas so that they can take preventive measures on time. In case the source is due to natural disasters, then also its effect will take some time to reach the project site and there is sufficient time to take preventive actions. To develop and operate such a communication system is the responsibility of the state government. The responsibility of the project is to develop links with state government, specially the irrigation department, so that they can receive such communications on time and translate into actions. The project shall develop its own communication and alarm system which will work as follows:

On receiving the message of `Disaster' from upstream sources, the Safety Executive, will instruct Commanding Officer **Security services** to sound SIREN WAILING TYPE FOR 5 MINUTES. On receiving the message of "Emergency Over" from Safety Executive All Clear Signal by Sounding Siren straight for two minutes will be given. The features of the alarm system will be explained to one and all to avoid panic or misunderstanding during disaster.

Quick Sand Conditions;

There may be possibilities of areas having quick sand conditions near the site where workers or domestic cattle may reach accidently and get trapped**.** A proper identification of the area will be done and sign boards will be placed at vernerable places to warn people from reaching quick sand areas.

Insect and Snake Bites:

The area of RBM is river beds having good habitation of benthic organisms, insects and snakes. During working, they may feel disturbed and there are possibilities of insect and snake bites. Anti venom injections will be kept at site and at contracted hospitals nearby and this will be admininstered only by a qualified doctor as mentioned in the Disaster Control Team responsibilities.

Fire and Explosions: The mining machineries use diesel and these may be stored at site. The fuel oil storage areas may face fire and explosion problems if the Hazardous Materials Act is not complied with.fire protection facilities will be provided as mentioned under Disaster Control Team responsibilities to handle fire Fire and explosion.

Fall in pits:

The entire work area is unprotected river bed. The levels are not uniform having pits and slopes. There are every possibility of workers, visitors and stray cattle to fall in pits. Fencing will be provided wherever is practicable as complete fencing of pits is not practicable.

Failure of Pit Slope

Pit will be created of limited depth only upto 3m with bench heights not exceeding 1m and a slope of 45^0. Thus the chance disaster during collapse of pits or failure of pit slope does not exist.

Failure of Waste Dump

No waste dump is created therefore the question of failure of waste dump does not exist.

Explosion, Fire

The operation does not need blasting and electricity and hence any fire or explosion disaster is not anticipated.

Accidents from Trucks/Dumpers

Movement of trucks and dumpers inside the lease area accident during loading and transportation of sand/ boulders may cause accidents.

I. Disaster Preventive Measures

It is not easy to control a disaster in absence of a contingency plans. For effective control of disaster, adequate manpower, technical know-how, alertness and internal help are necessary. In the proposed project, following prevention measures will be taken to prevent disaster.

Measures to Prevent Accidents Due to Trucks/Dumpers:

- All transportation within applied mining lease working shall be carried out directly under the supervision and control of the management.
- The vehicles will be maintained in good condition and checked thoroughly and vehicles without fitness certificate or PUC Certificate will not be allowed. In case of doubt, vehicles will be inspected by a competent person authorized for the purpose by the management.
- Road signs will be provided along the evacuation route showing maximum speed limit, school sites, market places, hospital sites or any other sites where crowds are anticipated en route and at each and every turning point up to the main road (wherever required).

- To avoid danger while reversing the equipment's/ vehicles especially at the working place / loading points, stopper shall be posted to properly guide reversing/ spotting operating, otherwise no person shall be allowed within 10 m radius of machine except operators.
- A statutory provision of the fences around deep pits, warning signs near quick sand conditions, constant education, training etc. about risk and hazards expected from the project shall be provided for reducing the incidents of such accidents.

i. *Project layout:*

- Provision of adequate access ways for the movement of equipment and personnel are kept.
- Minimum two numbers of escape routes for escape during disaster to be provided.
- Siting of fuel oil storage for mining machineries, if any, shall be in protected fenced area inside tank bund located on the shore and not in river bed.

ii. *Fire Fighting*

The proposed project will be provided with a Foam generator at the fuel oil storage site.

However, prior to installation of fire station & safety equipment, an experienced and qualified Fire Officer as per Factories Act will be engaged to carry out in-depth study and advise on the selection of equipment.

iii. *Safety*

The proposed project will have a Safety Executive who will be an experienced and qualified staff whose main job will be to bring about safety consciousness amongst the work force in the project. The Safety Executive will conduct regular safety awareness courses/drills by organizing training of the personnel

among the various working levels.

Safety awareness will also be created by the various posters highlighting the safe working practices in working area, public places and roads etc. Report will be given to Management for corrective measures to improve the safety conditions.

iv. Training

Management will arrange training on safety accident prevention, first aid, hazard control, housekeeping and environmental management. Special emphasis with mock drills in disaster control will also be planned.

v. Communication

In the proposed project, there will be up-to-date communication facilities with telecommunication and mobile phones, walkie-talkies, loud speakers to warn workers in case of an accident.

Other Possible Measures to Avoid Risks/ Disaster Due to River Bed Mining.

- Unwanted material including mineral or spillage (if any) shall not be stacked on the banks as it will hinder the flow of water in monsoon season causing water logging and damaging evacuation routes and nearby structures.
- Mining of minerals / working shall be started from the center line of lease area starting from dip to rise to avoid ponding and then laterally in 3 numbers of 1 meter high benches to avoid side collapsing.
- River banks will not be excavated to from access ramps. Only excavated and unsalable river gravel shall be used to form access ramps with allowable slope.
- Maintenance and monitoring of housekeeping: The area will be monitored every week by competent person and if maintenance is needed will be done as per requirement.

II. Contingency Plan and formation of Disaster Control Team

The contingency plan has been prepared from the experiences of accidents that have occurred in various other river side projects. The contingency plan being a dynamic plan will need periodical reviews and modifications with new experiences. Even with all precautionary measures taken to avoid disaster, disaster may occur. To tackle situations during and after disaster, a well-defined contingency plan and persons responsible to execute it is a must. The management will form a Disaster Control Team which will be headed by a Safety Executive, who is a senior full time employee of the company well qualified in Risk Management and Safety. The Safety Executive will be made responsible to handle disaster. On getting information about any accident, the officer will perform the following tasks:

- verify from the affected project site
- Inform the Management or other nominated coordinators immediately.
- To be responsible for planning and provisions of assistance from local authorities.
- To keep higher authorities informed about the situation.
- The decision of the Safety Executive on any matter to meet the objective of disaster control plan will be final.
- To identify persons from within the organization or outside local persons and form a Disaster Control Team.
- To convey message to his Disaster Control Team after consulting Management.
- Disaster Control Team will report to the Safety Executive and will consists of members from Casualty services, Rescue services, Fire fighting services, Traffic control, Training services, Depot and Transport

services, Supply Services, Salvage service, Welfare services, Security services and Public Relation Service.

- All the services will be headed by respective Commanding Officers.
- To consult between themselves on matters related to more than one service and to decide on the action to be taken.

Activities on Warning and Alert (As proposed in SDMP)

On the receipt of a warning or alert received from any such agency which is competent to issue such a warning, or on the basis of reports from District Magistrate/SP on the occurrence of a disaster, all community preparedness including counter-disaster measures will be put into operation.

- On the basis of reports from the possible disaster site.□
- On the receipt of warning or alert from EOC.

Coordination

Coordination involves the bringing together of agencies and elements to ensure effective response to emergencies. The district level will ensure co-ordination of resources to support operations which cannot be resourced locally, or which extend over more than one location. The highest level of operational co-ordination and support takes place at the State level. It is at this level that resource support from other States, Central Government and/or other agencies is assessed and requested. The response plan has been subdivided into the following sections:

A) Response Activities

b) Emergency Support Functions

a)Response Activities

Warning

Most of the disasters except earthquake and fires can be predicted and the community likely to be affected forewarned about any impending disaster through a proper warning mechanism.

Disasters for which warning is not possible include earthquakes, landslide, dam bursts, thunder and lightning and all accident related disasters. Floods, droughts, epidemics, industrial and chemical disasters are some of the disasters for which adequate warning could be given.

Warning to people through the Govt. field functionaries will be disseminated. Further, the List of Agencies competent for issuing warning or alert as proposed in SDMP are as given below:-

Disaster	Agencies
Earthquakes	Indian Meteorological Department Baba Atomic Research Centre Research Centre, Geological Survey of India, NGRI,
Floods	Indian Meteorological Department, Irrigation Department, Central Water Commission.
Adverse Climatic Conditions	Indian Meteorological Department

Industrial & Chemical Accidents	Police, Transport, Power Department of Industries
Fires (Urban & Forest)	Fire Brigade, Police, Forest Department

Evacuation

Evacuation is the planned relocation of persons from dangerous or potentially dangerous areas to safer areas and eventual return. Evacuated people are taken or directed to a place of relative safety, usually to an identified shelter or an emergency relief centre as per the Village/Block disaster management plans. The existing control rooms will act as the main hub for response
activities and for overall coordination.

For effective evacuation ensure the following:

- Shelter sites will be identified within close proximity (one hour walk and or within 5 km) of dwellings.
- Alternate routes will be planned well in advance.
- For appropriate security and law and order, evacuation will be carried out with assistance from police, fire brigade

b) Emergency Support Functions

The emergency support functions deals with the first response whenever a disaster strikes. The ESFs will come into operation on either receipt of warning of an expected calamity or in the event of a sudden emergency. The lead agencies involved in the management of these disasters are Search and Rescue, Health and Medical Care

(Mobile hospitals), Communication, Food & Civil supplies, PWD, Transport, Jal Sansthan, Power, Police, Fire etc. These lead agencies could be supported by a number of other department/agencies.

- **Early Warning**
- **Evacuation**
- **Search and Rescue**
- **Medical aid**
- **Shelter Management**
- **Emergency Relief**
- **Water Supply and Sanitation**
- **Infrastructure Restoration**

III. The responsibility of the members of the Disaster Control Team

i. Alarm System

In case of RBM projects, where maximum chances of disaster are due to flash floods and inundation due to anthropogenic or natural activities up stream, a proper communication and alarm system is the first requirement. The alarm system can be activated only if the Safety Officer is communicated the same from upstream sources on time. There is a time lag between the occurrence of the situation at source and its reaching the site, which are some distance away. If the source is due to anthropogenic reasons, the information must be communicated to downstream areas so that they can take preventive measures on time. In case the source is due to natural disasters, then also its effect will take some time to reach the project site and there is sufficient time to take preventive actions. To develop and operate such a communication system, it will be done in consultation with the state government. The responsibility of the project is to have facilities to receive such communications and translate into actions. The project shall develop its own communication and alarm system which will work as follows:

On receiving the message of `Disaster' from upstream sources, the Safety

Executive, will instruct Commanding Officer **Security services** to sound SIREN WAILING TYPE FOR 5 MINUTES. On receiving the message of "Emergency Over" from Safety Executive All Clear Signal by Sounding Siren straight for two minutes will be given. The features of the alarm system will be explained to one and all to avoid panic or misunderstanding during disaster.

ii. Casualty services

Casualty Services will be manned by a local Medical Officer or an appointed Medical Officer nominated as a member of Disaster Control Team. His functions will include:

- First aid service by first aid parties on the spot.
- Ambulance service for transport of casualties from the spot to nearest hospital.

Procedure for treatment

On getting a signal from the Safety Executive or information on telephone or hearing siren, the Member of the Casualty service and first aid personnel will report to Safety Executive. The Ambulance with the driver will report to site. First aid parties will render first aid to casualties at the place of occurrence and those requiring further treatment would be transported to the nearest hospital by ambulance. In case of extra help being required from outside Safety Executive will initiate for help in:

- Evacuating the casualties
- Essential assistance in first aid.
- Extra medical helps from neighboring hospital.

First Aid

It is necessary to give first aid to the persons injured in disaster. First aid post will be set up. At the post 1 first aid personnel shall be kept.

Equipment

Each member of the first aid will be provided with the personal equipments like Helmet, Water bottle, Torch, First aid box with Anti Venom.

✓ **Rescue services**

The responsibility of effective working of Rescue Services shall be with Member of the Casualty service as follows:

Rescue services

- To hand over injured persons to first aid parties
- To extricate persons from the debris and save human lives

Each rescue party will be provided with the following equipment:

- PETRONAS lamp, Torches
- Axes/hand saw
- Ropes
- Ladders
- Blankets
- Rubber shoes

Repair services

- To take up repair of damaged buildings, roads and culverts.
- To maintain essential public utility services
- To take up quick repairs of the damaged machinery.

✓ **Fire fighting services**

The functions of the fire fighting group will be:

- To enforce all regulations for prevention of fire.
- To co-ordinate fire fighting activities
- To request neighboring industries and District Authority for rendering services of their fire fighting crew under mutual aid schemes, if necessary.

✓ **Traffic control**

The free movement of the fire vehicles and ambulance at the scene of fire/emergency is very important and therefore the security personnel on duty

must ensure that all the roads at the scene of fire/emergency are kept clear and fire/emergency must not park their vehicles within 100 meters of fire, at road junction and at access roads. The ignition key should be left in the vehicles.

✓ **Training services**

The responsibilities of the training department in the context of disaster management shall be as given below.

- The faculty will consist of Safety Executive and all members of the Disaster Control Team
- To arrange training of volunteers/employees nominated by Safety Executive.
- To arrange refresher training courses once in a year.
- To arrange mock drills, twice in a year.
- To make a list of employees trained in various specialized disasters so that they can be easily contacted to handle a particular type of disaster. The person concerned will immediately report to Safety Executive.

✓ **Transport services**

The responsibilities of the transport department in the context of disaster management shall be as follows:

- Arranging vehicles from market and dispatch of vehicle to the place of incident as per orders from the Safety Executive.
- To return the vehicle as soon as the work is completed.
- The vehicles should be available at a short notice

Fuel: The **Transport services** will contact **Supply Services** for arrangement of fuel for vehicles during fuel crisis and stop supplying fuel to vehicles other than those, which are in use for disaster control.

✓ **Supply Services**

A senior person will head supply service from stores department. The

responsibilities include:

- Planning, organizing and procuring, of necessary equipment/materials.
- Storage of equipment/materials at accessible location and quick distribution on demand.
- To obtain the requirement of equipment/ materials from Commanding Officers of various services for their respective services.

✓ **Salvage service**

Their responsibilities will be:

- To salvage properties from debris
- To take care of such properties
- To co-ordinate patrolling with the help of police and security personnel for the safeguard of valuable properties till the same are removed to a safe place.

✓ **Welfare services**

Management of proposed project will nominate one person from administration side as the Commanding Officer of welfare services.
Emergency camps will be set up only in exceptional cases on available area. For this purpose necessary materials will be brought from nearby market. The function of the welfare officer will include:

- To provide shelters to affected persons.
- To arrange enough stock of essential commodities
- To arrange clothing and medicines to affected persons.
- To arrange drinking water, if supply is disrupted, with the help of District Authorities.

✓ **Security services**

Chief Security Officer will be Commanding Officer, Security Services. Security

services will be primarily responsible for the security of the project. His functions will include:

- To control the vehicular traffic inside the project.
- To help local police in patrolling the area of project and outside the battery area, if necessary.
- To assist various services in removing people from inundated areas, areas which have faced disaster and fighting fires.
- To assist in transporting injured persons.
- One jeep and one motor cycle will always be kept as reserve to cope with emergency demand and immediate mobility of security personnel.

✓ **Public Relation Service**

A senior officer from the organization will look after Public Relation Services as PRO. His responsibilities are:

- To consult Management before communication, if required with outside agencies.
- PRO will be the official spokesman for the proposed project with outside agencies.
- PRO will arrange for photography and filming of the whole disaster as photography and filming of such incidents are of immense value for the purpose of investigation, training and education.

IV. Fire and Explosion

Chances of fire and explosion from the project are insignificant. However, following contingency plans have been made:

- Safety Executive along with Commanding Officers takes overall charge of the situation
- Safety Executive will assess the situation for possible after effects of the fire in the project and the surrounding areas likely to get affected

- Safety Executive will inform local authorities to send fire tenders, if necessary
- Safety Executive will inform the nearby people of likely affected areas through communication system to leave the area and move to other areas earmarked, if necessary
- Safety Executive will inform coordinator, external services to inform the District authorities of the disaster and request them for help.
- To evacuate people from the affected areas outside the project.
- To control the traffic and maintain law and order.
- To arrange medical aid for the affected people.
- Safety Executive will arrange inspection of affected areas to get firsthand knowledge of damages occurred.

V. Food poisoning

In case of food poisoning the following actions will be taken:

- SAFETY EXECUTIVE will contact District Authorities and seek their help, if necessary.
- Security Personnel and employees will help in transporting the affected people to nearby health centres/ hospitals.

VI. Disaster due to Natural Calamity and External Factors

Most of the measures and processes shall be same as given under in-house disaster except that the Safety Executive will contact the State/ District authorities for necessary instructions to co-ordinate with them.

VII. Cloud burst/lightning

Cloud burst/lightning may lead to a situation which can lead to minor to major emergency in RBM projects due to flash flood and submergence. In such emergency, actions indicated under Disaster due to Natural Calamity and

External Factors will be initiated

❖ **Conclusion:**

In view of the imperative need to meet the gigantic challenge posed by natural hazards, the successes achieved, the experience garnered and the onerous task ahead to secure safety and Disaster-free functioning of the project, whether small or big, in the larger interests of the society and the people envisages an entire gamut of issues connected with mainstreaming disaster management concerns in the developmental efforts at all levels and across a spectrum of sectors. The main themes to be addressed are

- Ensuring proper siting of the project considering hazard parameters.
- Making mining processes inherently safe.
- Development of on-site and off-site DM plans in association with the District Administration.
- Conducting mock-drills at regular intervals to determine the efficacy of the DM plans.
- Preparation of inventory of corporate resources and uploading them on the IDRN – India Disaster Resource Network.
- Large-scale association with awareness generation initiatives aimed at building the knowledge, attitude and skills of the common people for a safer habitat.
- Mainstreaming private sector participation in disaster management.
- Establishing linkages between private sector and the community.
- Networking knowledge on best practices and tools for effective disaster management.
- Development and implementation of appropriate risk transfer mechanisms.

❖ **Contact Personnel:**

The DMP will be circulated to each and every member of the project with all contact details. However, only the Safety Executive is allowed to call Commanding Officers. All the Commanding Officers are provided with phone numbers of persons from within the organization and outside, whom they need to contact in case of a disaster. All the employees are strictly advised not to contact Commanding Officers of various services in case of Disaster as it will create confusion and may be misused to create panic.

The Safety Executive will be the overall incharge, who is the Coordinator Sh. D.S. Negi. Also two Sector Incharges and a manager has been nominated who will be responsible for entire work related disaster management. The names, Designaton & Contact Nos of the Coordinator, Sector Incharges & Manager has been given below. The below contact details along with the details of the commanding officers will be displayed at the site.

S.NO	Name of the officer	Designation	Mobile No
1.	Mr. D.S Negi	Coordinator	9412057902
2.	Mr. V.S Danu	Sector Incharge	9412403291
3.	Mr. Virendra Singh Rawat	Sector Incharge	7895105509
4.	Mr. Ajay Kandari	Manager	9568006611

In addition, all the rules and procedures given in State Disaster Management Action Plan (SDMP) for the State of Uttarakhand prepared by Disaster Mitigation & Management Centre, Uttarakhand Secretariat, Dehradun will be strictly followed.

Few emergency support functions as proposed in SDMP:

Emergency Support Functions

S. No	Emergency Support Function	Primary agencies	Support Agencies
1.	Search & Rescue, Evacuation, Fire Fighting	Police ,Medical, Fire Services	Water supply, Power corp. Quick Response Teams & teams ex Identified Units.
2.	Law & Order	Police	
3.	Medical Response & Trauma Counselling.	Hospitals, Red Cross, NGOS	Police, Transport, Jal Sansthan
4.	Communication	Relief Commissioner	BSNL ,Private Telecom Service Providers, Mobile Phone Operators.
5.	Relief. A. Food B. Shelter	Revenue Department, Food & Civil Supplies	Transport, NGOs, Corporate Sector, CBO
6.	Equipment Support, Debris and Road Clearance & Sanitation.	PWD/Army/BRO	Transport
7.	Water supply	Water Works Deptt	NGOs.
8.	Electricity	Power Corporation	Service Providers, Transport
9	Transport.	RTO	Municipal Corporation
10.	Help Lines.	Department of Disaster Management/Revenue Department/ Public Relation Officer/Industrial units	Department. of Information & Publicity, AIR, Doordarshan, Private TV Channels, UNI, Press, PTI,

Few Emergency contacts Nos.:

Indian Metrological Department		
1	**AVM (Shri Ajit Singh) DG (M)**	011-24611842, 9313982396
2	**Shri A. K. Bhatnagar ADG(M)**	(0)011-24619943, (R) 011-24654939, 09891399114
3	**Shri R.S. Dattatrayam Dir. In-charge Seismology**	(O) 011-24611305, (R) 24622827, 9868109671
Earthquake Control Room		
1	**Seismology Control Room**	011-24619943,24624588,24618241
2	**Flood Control Room**	011-24631913

Contact No.: For Ambulance -102, 108 & Emergency - (0135) 252229

(Source: SDMP)

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Head Office

Uttarakhand Environment Protection & Pollution Control Board
29/20, Nemi Road, Dalanwala, Dehradun (Uttarakhand)

UEPPCB/HO/ NOC-1983/2014/ 838 **Date :** 22/8/2014

Speed Post

37
27-8-14

To,

The Secretary,
Ministry of Environment & Forests,
Paryavaran Bhawan, CGO Complex,
Lodhi Road, New Delhi-110003.

Subject :- **Minutes of Public Hearing of M/s Garhwal Mandal Vikas Nigam Ltd. for Collection of Sand, Bajri & Boulders from Lot No. 14/6 of River Aasan, Vikas Nagar, Dehradun – reg.**

Sir,

This is to inform that **Uttarakhand Envrionment Protection and Pollution Control Board** has conducted the Public Hearing of **M/s Garhwal Mandal Vikas Nigam Ltd for Collection of Sand, Bajri & Boulders from Lot No. 14/6 of River Aasan, VikasNagar, Dehradun on dated 16.07.2014 at Rajkiya Purva Madhyamik Vidhyalaya, Sabhawala, Sahaspur, Dehradun.** The copy of the minutes of **Public Hearing** along with video recording, photography of entire Public Heairng and copy of attendence sheets are enclosed herewith for your kind persual and necessary action please.

Enclosed :- as above.

Yours Faithfully

(Vinod Singhal),
Member Secretary

Copy to :-

1. **District Magistrate, Dehradun** for kind information and with request to display the minutes of respective public hearing at your office for general information please.
2. **The Additional District Magistrate, Distt- Dehradun** for kind information please.
3. **Regional Officer (I/C) UEPPCB, Dehradun** with direction to display the minutes of respective public hearing at your office for general information please.
4. **Managing Director, M/s Garhwal Mandal Vikas Nigam Ltd. 74/1, Rajpur Road, Dehradun** for kind information and with request to display the minutes of public hearing to the office of the panchayat//Urban Local Bodies, whose jurisdiction the project is located for general information please.
5. **Asst. Programmer, Uttarakhand Environment Protection and Pollution Control Board, Dehradun** with request to upload of minutes of public hearing to Board's web site on priority basis.

Member Secretary
21/8/14

मै0 गढ़वाल मण्डल विकास निगम (GMVN) लि0 देहरादून द्वारा आसन नदी लॉट नं–14/6 में लघु लवणों के संग्रहण हेतु पर्यावरण स्वीकृति हेतु लोक सुनवाई दिनांक 16.07.2014 (अपरान्हः 2.00 बजे) स्थान राजकीय पूर्व माध्यमिक विद्यालय, सभावाला, सहसपुर, जनपद देहरादून का कार्यवृत्त।

मै0 गढ़वाल मण्डल विकास निगम, देहरादून द्वारा आसन नदी लॉट नं–14/6 में लघु लवणों के संग्रहण हेतु पर्यावरण स्वीकृति के लिये जन सुनवाई का आयोजन किया गया। पर्यावरणीय स्वीकृति हेतु उत्तराखण्ड पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण बोर्ड, देहरादून में प्रस्ताव प्राप्त हुआ। उक्त प्रस्ताव पर्यावरण एवं वन मंत्रालय भारत सरकार की पर्यावरणीय प्रभाव मूल्यांकन, अधिसूचना–2006 के अतर्गत आच्छादित है। उक्त परियोजना की पर्यावरणीय प्रभाव मूल्यांकन आख्या, पर्यावरणीय प्रभाव अधिसूचना–1994 यथासंशोधित के अनुसार तैयार की गयी है तथा लोक सुनवाई पर्यावरणीय प्रभाव मूल्यांकन अधिसूचना–2009 के अनुसार की गयी है।

दिनांक 30.06.2014 को जिलाधिकारी महोदय द्वारा नामित अपर जिलाधिकारी (वित्त एवं राजस्व), देहरादून श्री प्रताप सिंह शाह, की अध्यक्षता में स्थान राजकीय पूर्व माध्यमिक विद्यालय, सभावाला, सहसपुर, जनपद देहरादून में लोक सुनवाई आयोजित की गयी। राज्य बोर्ड के प्रतिनिधि के रूप में सुभाष पंवार (अ0 अभियन्ता) व सुनील डबराल (अनु0 सहा0) उपस्थित थे।

अध्यक्ष महोदय की अनुमति से 2.00 बजे प्रातः लोक सुनवाई की कार्यवाही प्रारम्भ की गयी।

सर्वप्रथम उत्तराखण्ड पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण बोर्ड के प्रतिनिधि सुभाष पंवार (अ0 अभियन्ता) द्वारा लोक सुनवाई के आयोजन के उद्देश्य के बारे में उपस्थित जन समुदाय को अवगत कराया गया और कहा गया कि उत्तराखण्ड पर्यावरण संरक्षण एवं प्रदूषण नियंत्रण बोर्ड, देहरादून को मै0 गढ़वाल मण्डल विकास निगम, देहरादून द्वारा आसन नदी में लघु लवणों के संग्रहण/एकत्रण हेतु प्रस्ताव प्राप्त हुआ है। भारत सरकार की अधिसूचना सितम्बर–2006 यथा संशोधित के अनुसार परियोजना में पर्यावरणीय स्वीकृति हेतु जन सुनवाई का प्राविधान है। इस हेतु लोक सुनवाई की तिथि से नियमानुसार 30 दिन पूर्व दैनिक समाचार पत्र दैनिक जागरण व टाईम्स ऑफ इण्डिया के दिनांक 21.05.2014 के अंक में इस आशय की सूचना प्रकाशित की गयी थी। विज्ञप्ति के माध्यम से जन साधारण द्वारा इस परियोजना के कियान्वयन से पूर्व सुझाव आपत्ति, टीप टिप्पणी आपेक्ष मांगे गये थे। यदि स्थानीय लोगों की परियोजना के बारे में कोई आपत्ति या सुझाव हैं तो उनको इस लोक सुनवाई के माध्यम से पर्यावरण एवं वन मंत्रालय, भारत सरकार को प्रेषित किया जायेगा, उनके द्वारा जन समुदाय से अनुरोध किया गया कि विचार, सुझाव परियोजना के पक्ष में अथवा विपक्ष में इस मंच के माध्यम से आमंत्रित हैं,

जिनकी अनवरत वीडियो रिकार्डिंग एवं फोटोग्राफी भी की जायेगी। मंच के माध्यम से आप सभी के महत्वपूर्ण विचार इस परियोजना के कियान्वयन हेतु एक निर्णायक भूमिका की अभिव्यक्ति होगी।

तदोपरान्त लोक सुनवाई कार्यक्रम के अध्यक्ष श्री प्रताप सिंह शाह, अपर जिलाधिकारी (वित्त एवं राजस्व) द्वारा लोक सुनवाई में उपस्थित जन समुदाय से कहा गया कि परियोजना के सम्बन्ध में जो भी आपत्ति एवं सुझाव हैं उन्हें मौखिक या लिखित रूप में व्यक्त करें, जिनको मिनिट्स में सम्मिलित कर पर्यावरण एवं वन मंत्रालय को प्रेषित किया जायेगा।

इस अनुक्रम में मै0 गढ़वाल मण्डल विकास निगम के परामर्शी संस्था के प्रतिनिधि श्री एस0पी0 सिंह द्वारा परियोजना से सम्बन्धित विस्तृत जानकारी दी गयी एवं अवगत कराया गया कि परियोजना का कुल क्षेत्रफल 32.709 है0 है। जो कि ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर एवं सहसपुर, तहसील विकासनगर, जनपद देहरादून में स्थित है। उक्त परियोजना पूर्णतः सरकारी भूमि पर प्रस्तावित है। जिसे राज्य सरकार द्वारा गढ़वाल मण्डल विकास निगम को लीज पर दिया गया है।, परियोजना हेतु किसी प्रकार की निजी भूमि का प्रयोग नहीं किया जाता है। इस परियोजना का प्रमुख उद्देश्य बोल्डर, बालू व बजरी का चुगान/खनन किया जाना है जिनका उपयोग विभिन्न निर्माण कार्यो में किया जायेगा। नदी में लघु लवणों के इकट्ठे होने की वजह से नदी अपना मार्ग बदल देती है, एवं चुगान न होने से बरसात में भूमि कटाव होता है, जिससे कि कृषि योग्य भूमि के साथ–साथ सड़कों/मार्गों को नुकसान पहुँचता है। खनन कार्य को वैज्ञानिक तरीके से किये जाने पर भूमि कटाव की रोकथाम के साथ–साथ स्थानीय निवासियों को रोजगार उपलब्ध होंगे एवं खनिज के दामों में भी कमी आयेगी। परियोजना से लोगों की सामाजिक एवं आर्थिक स्थिति में सुधार होगा एवं राज्य सरकार को भी राजस्व प्राप्त होगा। उन्होनें यह भी कहा कि इस परियोजना से रोजगार को बढ़ावा दिया जायेगा। इस परियोजना में नदी के तटों से 15 प्रतिशत भाग को छोड़कर लघु लवणों का संग्रहण किया जायेगा, उनके द्वारा अपनी प्रस्तुतीकरण में यह भी बताया गया कि 1.5 मीटर गहराई तक रेत, बजरी, बालू का संग्रहण किया जायेगा और संग्रहण कार्य सूर्योदय से सूर्यास्त के बीच किया जायेगा तथा संग्रहण कार्य पूर्णतया मैनुअल किया जायेगा जिसमें कोई हैवी मशीनरी का उपयोग नहीं किया जायेगा। यह परियोजना पूर्ण रूप से वैज्ञानिक तरीके से की जायेगी। श्री एस0पी0 सिंह द्वारा अपने प्रस्तुतीकरण में यह भी अवगत कराया गया कि खनन कार्य से होने वाले प्रदूषण के नियंत्रण हेतु पर्यावरणीय प्रबन्धन योजना (ईएमपी) बनायी गयी है, जिसमें वायु प्रदूषण नियंत्रण हेतु सड़कों पर जल छिड़काव एवं समय–समय पर वायु गुणवत्ता का अनुश्रवण कर तदानुसार पर्यावरणीय प्रबन्धन योजना बनायी जायेगी। पर्यावरणीय प्रबन्धन योजना के अनुश्रवण हेतु पर्यावरणीय सुरक्षा दल का गठन किया जायेगा। पर्यावरणीय प्रबन्धन योजना हेतु अलग से वार्षिक बजट रू0 5.91 लाख का प्राविधान किया गया है,

जिसका उपयोग जल छिड़काव, सड़कों की मरम्मत एवं वृक्षारोपण आदि कार्यों में किया जायेगा।

प्रस्तुतीकरण के बाद परियोजना के सम्बन्ध में जन समुदाय द्वारा प्रस्तुत सुझावों एवं आपत्तियों का विवरण निम्नानुसार है–

1. **कमरूदीन (भूतपूर्व प्रधान) सहसपुर** द्वारा खनन कार्य हेतु सहमति व्यक्त की गयी और खनन आरम्भ होने पर खुशी जताई गयी और गढ़वाल मण्डल विकास निगम द्वारा खनन किये जाने का स्वागत किया गया। उनके द्वारा कहा गया कि पूर्व में खनन बन्द होने से सरकार एवं स्थानीय लोगों को बहुत हानि हुई है। खनन न होने से बरसात में बाढ़ आने से जानमाल की काफी हानि हुई है लोगों के खेत कट गये हैं जिससे उनको काफी नुकसान उठाना पड़ रहा है। उनके द्वारा यह भी कहा गया कि खनन वैज्ञानिक तरीके से ही किया जाये तथा स्थानीय निवासियों को निजी कार्यों हेतु खनन सामग्री में रियायत दी जाये, पेड़–पौधों को न काटने पर बल दिया गया, खनन कार्य में लगे ओवरलोडिंग ट्रकों पर रोक लगानी चाहिए, जिससे दुघर्टना न हो । उनके द्वारा कहा गया कि खनन में बुग्गी आदि को रायल्टी में छूट प्रदान की जाये।

2. **हारून अली (ग्राम प्रधान), निवासी जाटोवाला,** द्वारा खनन कार्य में सहमति व्यक्त की गयी और कहा गया कि हमारे गांव में बहुत गरीब लोग रहते हैं। खनन कार्य मे बेरोजगारों को रोजगार मिलना चाहिए। बरसात के मौसम में बाढ़ का खतरा रहता है तथा जंगल के पानी से भी कटाव होता है तथा कच्चे रास्तों का भी नुकसान होता है। खनन होने से बरसात में बाढ़ का खतरा कम हो जायेगा। उनके द्वारा सुझाव दिया गया कि स्थानीय निवासियों को खनन सामाग्री निशुल्क मिलनी चाहिए।

3. **नरेश तोमर (अध्यापक) सभावाला** द्वारा कहा गया कि खनन के मानक तय होने चाहिए, जिससे एक ही स्थान पर चुगान ज्यादा मात्रा में न हो। उनके द्वारा खनन कार्य में सहमति व्यक्त की गयी।

4. **अशोक कुमार (अध्यापक), सभावाला द्वारा** खनन कार्य हेतु सहमति व्यक्त की गयी और कहा गया कि क्षेत्र के लोगों को रियायती दर पर खनन सामग्री मिलनी चाहिए। उनके द्वारा कहा गया कि इस गांव में गरीब लोग निवास करते हैं। क्षेत्र के बेरोजगार बच्चों को रोजगार के अवसर मिलने चाहिए। खनन के हर पैमाने का ध्यान रखा जाये एवं खनन कार्य से कोई दुघर्टना न हो।

5. **उषा मौर्य (अध्यापिका) द्वारा** कहा गया कि खनन कार्य की मजदूरी तय की जानी चाहिए। खनन कार्य में मजदूरी लोकल मजदूरी से ज्यादा हो। उनके द्वारा इस बात

पर भी बल दिया गया कि खनन कार्य में क्षेत्र के लोगों के परिवार से एक–एक व्यक्ति को मजदूरी दी जाये।

6. **अर्चना पन्त (अध्यापिका), सभावाला द्वारा** कहा गया कि बाल मजदूरी पर रोक लगनी चाहिए । खनन कार्य में नाबालिक युवकों को काम पर नहीं लगाना चाहिए। क्योंकि स्कूल के छात्र पैसे कमाने के लालच में खनन कार्य में लग जाते हैं जिससे उनकी पढ़ायी का बहुत नुकसान होता है।

7. **सत्यपाल, निवासी, सभावाला द्वारा** कहा गया कि आसन नदी में खनन होना चाहिए। इसके अतिरिक्त जंगल की चट्टानें भी बरसात में नीचे आ रही हैं। उनके भी खनन का कोई वैज्ञानिक तरीका होना चाहिएं। खनन कार्य में गरीब बच्चों को भी रोजगार मिलने की व्यवस्था की जाये।

8. **विनोद कुमार, ग्राम तिपरपुर द्वारा** खनन कार्य में झोटा–बुग्गी को रायल्टी में छूट देने पर बल दिया गया।

अपर जिलाधिकारी द्वारा अवगत कराया गया कि समस्त खनन कार्य राज्य सरकार की भूमि से किया जायेगा। सरकारी भूमि में खनन होने से अवैध खनन नहीं होगा, जिससे खनिज दर स्वतः कम हो जायेगी एवं स्थानीय व्यक्तियों को खनिज सामग्री में छूट हेतु शासन स्तर से पत्राचार किया जायेगा। राज्य सरकार की खनन नीति के अनुसार खनन कार्य से प्राप्त लाभांश के 5 प्रतिशत भाग को खनिज विकास निधि के माध्यम से स्थानीय ग्रामीणों के विकास कार्यों में व्यय किया जायेगा। इसके अतिरिक्त पट्टा धारक संस्था द्वारा कारपोरेट सोश्यिल रिस्पोंस्बिलिटी (CSR) के अन्तर्गत अपने लाभांश का कुछ भाग स्थानीय सामाजिक एवं विकास कार्यों में व्यय किया जायेगा।

अन्त में उक्त आपत्तियों के अनुक्रम में जीएमवीएन के प्रतिनिधि द्वारा उपरोक्त सुझावों के अनुक्रम में अवगत कराया गया कि खनन कार्य के दौरान माल वाहक वाहनों के परिवहन हेतु वैकल्पिक मार्ग की व्यवस्था की जायेगी एवं प्रदूषण नियंत्रण हेतु पर्यावरणीय प्रबन्धन योजना के अनुसार कार्य किया जायेगा। यह सुनिश्चित किया जायेगा कि कोई भी बाल मज़दूर खनन कार्य में न लगना पड़े। इसके अतिरिक्त उनके द्वारा अवगत कराया गया कि स्थानीय ग्रामीणों के विकास हेतु कारपोरेट सोश्यिल रिस्पोंस्बिलिटी (CSR) के अन्तर्गत खनन कार्य से प्राप्त लाभांश का कुछ भाग विभिन्न सामाजिक विकास कार्य में व्यय किये जाने का भी प्राविधान है। स्थानीय स्तर पर खनन कार्य होने से स्थानीय रोजगार उपलब्ध होना स्वाभाविक है। इसके अतिरिक्त उनके द्वारा बताया गया कि खनन कार्य न होने के कारण नदी का वास्तविक स्वरूप बदल जायेगा और नदी जंगल एवं कृषि भूमि का कटाव

व गो इसलिये नदी का चुगान वैज्ञानिक तरीके से करना अति आवश्यक है। परियोजना के अन्तर्गत स्थानीय लोगों की सहभागिता का भी पूरा ध्यान रखा जायेगा। यह भी सुनिश्चित किया जायेगा कि खनन वैज्ञानिक तरीके से किया जाये जिससे पर्यावरणीय क्षति न हो। अन्त में सभा में उपस्थित व्यक्तियों द्वारा हाथ खड़े कर खनन कार्य हेतु सहमति व्यक्त की गयी।

तदोपरान्त लोक सुनवाई की कार्यवाही अध्यक्ष महोदय की अनुमति के द्वारा समापन की घोषणा की गयी है। जन सुनवाई की कार्यवाही की फोटाग्राफी एवं वीडियोग्राफी की गयी है।

संलग्नक–

1. फोटो – 03
2. डी0वी0डी0 – 03
3. उपस्थिति पंजिका – 03

(सुनील डबराल)
अनु0 सहा0

(सुभाष पंवार)
अ0 अभियन्ता

(प्रताप सिंह शाह)
अपर जिलाधिकारी (वि0/रा0)
देहरादून

न्यायालय श्री [illegible] के समक्ष वाद संख्या 14/16 में प्रतिवादी/प्रतिवादीगण हेतु दिनांक 16/07/2014 समय 2:00 बजे उपस्थित पूर्व माध्यमिक विद्यालय ग्राम रायावाला, खण्ड विकास सहसपुर, जनपद देहरादून में वाद के वादप्रतिवेदिकाओं की उपस्थिति का विवरण।

क्र.	नाम व पद	पता	संपर्कसूत्र	हस्ताक्षर
1)	श्री प्रतापसिंह रावत (Asstt. DM/R)	जिला प्रशासन देहरादून	9756666555	
2)	श्री सुभाष पंवार (क० अधि०)	प्रबन्धन बोर्ड देहरादून	9410393545	
3)	श्री सुनील डबराल (अनुभाग)	प्रबन्धन बोर्ड देहरादून	9634837122	
4)	S P SINGH, ~~Fire~~ Asstt.	C.R.C. Noida	09953730351	
5)	Vinesh Kumar	" "	8377078376	
6)	सत्यपाल	रायावाला	—	सत्यपाल
7)	अमर	रायावाला	—	अमर
8)	बाबूलाल	रायावाला		
9)	पालसिंह	रायावाला	—	पालसिंह
10)	गांधी राम	गैंडीपुर	—	गांधी राम
11)	मानसिंह	गैंडीपुर		मानसिंह

(14)	सुरेन्द्र	सभा वालपुर		सुरेन्द्र
(15)	विनोद	निपटपुर		विनोद
16	गौतम सिंह	लिधर कुर		गौतम सिं
17	सूचना पद (सरपंच)	सभावाला		
18	अशोककुमारकाम्बोज सरपंच	सभावाला	9411314277	
19	नरेश सिंह	सभावाला	9411312383	
20	रियाकत अली	सभावाला	9411719394	
21	निशा केन्द्र	सभावाला		
22	उपमोपि	सभावाला	9410930712	
23	Ashwani Sirmaur	Emvn 2nd	9897735856	
24	Jan chand	Sabhawala	9058818884	
25	इंद्रपाल	सभावाला		इंद्रपाल
26	रियाकत अली (सरपंच)	व.प्र मा. वि. सभा वाला	9634607044	
27	मुन्ताज अली (सरपंच)	" "	9416757979	
28	रविन्द्र सिंह	सभावाला		रविन्द्र सिंह

29	[illegible]	[illegible]	[illegible]	[illegible]
30	सोमपाल	समावाला	9758245665	[illegible]
31	Mr. B.S. Dann Secty Irrig. Govt Uttarakhand		9412403291	[illegible]
32	[illegible]	[illegible]	[illegible]	[illegible]
33	B.S. Rawat	E.N. V.M. Uttarakhand	9557053305	[illegible]
34	प्रकाश सिंह	[illegible]		प्रकाश सिंह
35	[illegible]	[illegible]	9412403244	[illegible]
	[illegible]	[illegible]	9758995536	[illegible]
36				
37				
38				
39				
40				

AASAN 14/6

S. No.	Name of Person with address	Queries Asked	Replies	Plan of Action	Budget Allocation
1	Sh. Kamruddin (Ex-Pradhan) R/o Sahaspur	He expressed satisfaction for the mining activity and welcomed GMVN for doing mining. He said that due to stoppage in mining activity previously, government and local people were faced loss. He informed that due to no mining activity floods and erosion of agricultural lands occurred in rainy seasons due to which heavy loss of health and wealth were arises. He advised that mining should be done scientifically and concession should be given in mining minerals to the local people for their personal use, Attention given to stop cutting of plants and trees, ban on overloading trucks to avoid accidents. Royalty should be discounted on transportation of minerals using *Buggis.*	Mining will be done scientifically. 5% of the project cost will be for the development of the villagers under CSR activities.	Overloading will not be allowed. Scientific mining will be carried out.	Rs. 80, 000 /- (For CSR Activity)
2	Sh. Harun Ali, Gram Pradhan R/o Jattowala	He expressed satisfaction for the mining activity and said that in our village very poor people live. In mining activity employment should be given to the villagers. In rainy season chances of floods are there and erosion in forest occurs due to water as well as harm to the un-metalled roads also occurred, due to mining chances of floods will be reduced He suggested that mining materials should be provided to the villagers without any charge.	Priority will be given to the local villagers for employment.	It will be ensured that employment will be given to local villagers.	--
3.	Sh. Naresh Tomar, Sabhawala	He said that parameters of mining should be there due to which mining will not be done at a single place. He responded in favor of mining.	Mining will be done according to the minor mineral rules and regulations	---	--
4.	Sh. Ashok	He responded in favor of mining and suggested	Priority will be	Safety will be	--

	Kumar, Teacher, R/o Sabhawala. .	that the material should be given to the local villagers at a discounted price. Employment opportunities should be given to the local people. Attention should be given in each and every aspect of mining and no accidents should be occurred due to mining activity.	given to the local villagers for employment	ensured and Uttarakhand Minor Mineral Concession Rules will be followed.	
5	Usha maurya (Teacher)	She said that in mining activity wages to the workers should be fixed and priority should be given to the local workers. She also forced to pay attention that during mining activity at least single person from each family of the area should be employed	Priority will be given to the local villagers for employment.	Same will be ensured	--
5	Smt. Archana Pant (Teacher), R/o Sabhawala.	She said that ban on child laborers should be there and they will not be employed for mining activity because in order to earn money school children's get employed themselves which in turn harm their studies.	--	Child labour will strictly not be allowed.	--
6	Sh. Satyapal R/o Sabhawala.	He said that mining activity should be done in Aasan River. As well as forest rocks also drowning in rainy season and scientific technique should be there for mining of these rocks. In mining activity some arrangements should be there to give employment to the poor children's.	--	Employment will be given to adults only and Child labour will strictly not be allowed.	--
7	Vinod Kumar R/o Tiparpur	He suggested that *Jhota-Buggi* should be given discount on royalty.	--	--	--

MINING PLAN

FOR SAND, BAJRI AND BOULDERS
IN
RIVER ASAN, LOT No. 14/6
***KHASRA* NO. : 2 मि0, 1मि0 585मि0 593मि0 594मि0**
AREA: 32.709 ha.

At

VILLAGE – SABHAWALA, INDRIPUR, LAKSHMIPUR & SAHASPUR,
TEHSIL – VIKASHNAGAR
DISTRICT –DEHRADUN (UTTARAKHAND)

APPLICANT

M/s GARHWAL MANDAL VIKAS NIGAM LTD.
74/1, RAJPUR ROAD,
DEHARDUN (UTTARAKHAND)
PIN- 248001,
PH. - 0135-2740896, 2746817, 2749308

भूतत्व एवं खनिकर्म इकाई,
उद्योग निदेशालय, उत्तराखण्ड
देहरादून
शर्तों के अधीन अनुमोदित
पत्रांक 2217
दिनांक 3/3/16
निदेशक

PREPARED BY

Harish Kainthola
RQP/DDN/141/2002-A
(Valid upto 16 Jan. 2017)

CONTENTS

LIST OF ANNEXURE

LIST OF PLATES

CHAPTER - 1

GENERAL INFORMATION

M/s Garhwal Mandal Vikas Nigam (GMVN) Ltd. has got Letter of Intent in Villages- Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil- Vikasnagar, Distt. - Dehradun (Uttarakhand) for preparation of mining plan for Mining License (ML) from Government of Uttaranchal over an area of 32.709 ha (Lot No. 14/6) for sand, bajri & boulder in single block in Aasan River for the period of 05 year (Annexure No.-1). Demarcated Cadastral (*Khasra*) Map (Annexure No.-2) is provided by the GMVN. The applied area is jointly inspected by different state Govt. authorities (Annexure No. 3).

The mining plan of the area is prepared by Harish Kainthola (RQP), Lane No.- 8, Indraprashtha, Upper Nathanpur, Ring road, Dehradun, Regd. No.: RQP/DDN/141/2002-A, for estimating the reserve of mineral (sand, bajri, boulder).

M/s Garhwal Mandal Vikas Nigam Ltd. has authorised Shri Harish Kainthola, RQP No. RQP/DDN/141/2002-A to prepare the Mining Plan in respect of Sabhawala, Indripur, Lakshmipur & Sahaspur, area over an area of 32.709 ha for minor mineral, having the *khasra* Nos. 2मि, 1मि, 585मि, 593मि, 594मि, falls under *Nap* land in Villages- Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil- Vikasnagar, Distt. Dehardun, Uttarakhand (Annexure No. 5).

HARISH KAINTHOLA
RQP/DDN/141/2002-A

CHAPTER – 2

DETAIL INFORMATION OF QUARRY LEASE

Name & Address of the Applicant:
M/s Garhwal Mandal Vikash Nigam Ltd., 74/1, Rajpur Road, Dehardun (Uttarakhand) 248001, Ph.- 0135-2740896, 2746817, 2749308.

Status of the Applicant:
Govt. Body. Applicant has 10 year experience in mining activities.

Minerals which are occurring in the area and which the applicant intends to mine:
Sand, bajri and boulder (RBM)

Status of the area:
M/s Garhwal Mandal Vikash Nigam Ltd has applied for an area of 32.709 ha having the *khasra* Nos. 2मि, 1मि, 585मि, 593मि, 594मि, falls under *Nap* land in Sabhawala, Indripur, Lakshmipur & Sahaspur Tehsil- Vikashnagar, Distt. Dehardun, Uttarakhand.

Period for which the mining lease is granted / renewed / proposed to be applied:
5 years

Name, Address & Registration No. of the recognized person, who prepared the Mining Plan:

Shri Harish Kainthola,
Lane No. 8, Indraprastha,
Mussoorie by pass road, Upper Nathanpur,
Dehra Dun- 248008 (Uttarakhand)
Telephone (Cell): 09412028745, 09412058990 (Office), 0135-2734986 (Resi.)
E-mail – hkainthola@gmail.com, kain_geotech2147@rediffmail.com
Registration No. - RQP/DDN/141/2002-A
Valid up to - 16 Jan 2017 (Annexure No - 4)

Infrastructure facilities –

Power & Electricity:

The lease area falls in villages Sabhawala, Indripur, Lakshmipur & Sahaspur, which are electrified by 220 volt supply; nearly 80% area fall 5 km periphery of the area is electrified.

Water Supply:

Water table of this area is about 60-90 ft below the ground. Dug wells and spring water are used for drinking water purposes. For irrigation, small canal are made on the

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perennial *nalas* and water supply for drinking purpose through pipelines by Uttarakhand Jal Sasthan.

Post office & Telegraph:

Post Office is situated at Sahaspur which is about 1 km away from lease hold area.

Education institute:

Primary School is available in the Sabhawala & Sahaspur which is about 1 km away from lease hold area.

Senior Sec. School and are available in the Sahaspur which is about 1 km away from lease hold area.

For getting higher studies, people are going to Dehradun which is about 35 km from the lease area.

Health facility:

In Sahaspur, a Govt. hospital is available, which is about 1 km from lease area. District hospital is situated at Dehradun, which is 35 km away from the lease area.

Police station:

The nearest police station is at Sahaspur which is about 7 km from applied area.

Bank:

There are number of banks available at Sahaspur which is about 1 km from the applied area.

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CHAPTER-3

GEOLOGY AND RESERVES

Physiography:

Physiographically, the area is simple except a few dip slopes composed of Pleistocene and Recent deposits facing the syncline Doon valley and ridges & cliffs of the Upper Siwalik Conglomerates. The Middle Siwalik Formation develops low rounded hills with distinct marked lowering throughout northern margin of the unit as compared to southern margin. The important rivers of the area are Tons, Suarna and Chorkhala running approximately south to south-west directions and Asan running approximately south-east direction. The climate of the area is inter- continental (monsoon type). Maximum temperature reaches 41^0C and the minimum even to freezing points in winters. Average rainfall is about 80 inches and most of it flows as runoff and some percolates in sandstones and conglomerates.

Regional geology:

Situated in the annals of Garhwal Himalaya, the district of Dehradun occupies the long techtonic 'Doon Valley' of the outer Himalaya. It lies within the Pre-Tertiary ranges of Lesser Himalaya to the north, and the Siwalik ranges of Outer Himalaya to the south. The Siwalik rocks have been folded into an overturned syncline, flanked by two anticlines. The syncline shape of Siwaliks has controlled the geomorphological development of Doon Valley (Auden, 1937).

The terrain around Dehradun is fall of minor ridges and valleys. A prominent ridge runs north-south. Western part is washed by the river Tons, Noon Nadi and Asan, tributaries of Yamuna, flowing towards ENE and the eastern segment is drained by the WNW-ESE flowing river Suswa, a tributary of Ganga.

Lithostratigraphy of the Upper Siwalik and Post-Siwalik sediment in Tons Valley is given below:

Age	Formations	Divisions	Lithology	Average Thickness
Recent (Quaternary)	Doon Gravels	Tons/Asan Alluvium	Alluvium	
Sub-Recent	Post-Siwaliks	New Terrace sediments	Gravel and pebble beds with brown clay bands	70m
Upper-Pleistocene-Mid Pleistocene		Old Terrace sediments	Boulder beds, sand, yellow and maroon clay bands	44m
Unconformity				
Lower Pleistocene	Upper Siwaliks	Boulder conglomerates ?	Alternating conglomerates. Sand and clay bands	147m

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The Upper Siwalik partly ranges into Pleistocene which is probably represented by the Boulder Conglomerate Stage here. These are overlain by Post-Siwalik sediments with a pronounced unconformity. The Siwalik rocks constitute low ranges in this area, whereas the Post- Siwalik constitutes the older and newer terraces of the river Tons/Asan.The Quaternary part of the Upper Siwalik consists mainly of conglomerates with alternating sand and clay beds. The conglomerates contain pebble mainly of quartzite, slate, limestone, sandstone etc. embedded in a sandy matrix. The Old Terrace sediments contain boulder and gravel beds with smooth, but often cracked boulders mainly of quartzite, phyllite, schist, sandstone etc. embedded in coarse sandy matrix. There are some bands of yellow and maroon clay along with some sandy and sandy clay horizon. These sediments generally lie horizontally, but occasionally show gentle southerly dips. The New Terrace sediments contain pebble and gravel horizons with unconsolidated material composed mainly of limestone, quartzite etc. There are some brown coloured clay bends, which appear to be older Alluvium. These are usually placed horizontally, unconformably overlying the Old Terrace sediments. Sometimes, these even overlap the Old Terrace, and directly overlie the Siwalik and other formation. These Post- Siwalik sediments exhibit variable thicknesses. Tube well data shows a gradual increase in their thickness from west to east. In the western part of the area the Old Terrace is 12m and New Terrace is 36 m thick.

In Lesser Himalayan Zone steeply sloping northern flank of the valley comprising rocks of the Lesser Himalayan formations, such as quartzite, schist, slates, phyllites, hard sandstone, limestone and dolomite of the Chandpur, Nagthat, Blaini, Krol and Tal Formations and having secondary porosity and permeability and are characterised by springs and seepages. Though sedimentary in nature the rocks have very low intergranular porosity and are characterized by fissures, fracture and joints. The zones of lineament, faults and the Main Boundary Thrust show pockets of high secondary porosity. The groundwater/sub-surface water in this zone occurs largely as disconnected local bodies in favourably perched aquifers under both confined and unconfined conditions and also in zones of jointing, fracturing and faulting. Relatively flat areas and gently sloping grounds characterized by deep weathering, such as hill-tops, ridges, saddles, spurs and bulges of old landslide-debris, river terraces and fluvial fans from the recharge area while steeper hill-slopes, Ist or 2nd order stream at slope breaks and scraps of fans are sites of discharges. The upper portions of the catchment areas are saucer-shaped. The springs in the rocks of the secondary porosity show great variability in yield even within short distances. The limestone and dolomite of the Krol Formation is characterized by cavities and solution channels oriented along WNW-ESE and NW-SE trending joints. The sand-gravel deposits of fluvial and colluvial origin in the Lesser Himalayan Zone lying in the lower reaches of the stream or near the confluence of two streams in the form of fan and terraces are highly porous and permeable and therefore, hold sufficient quantities of water.

In Synclinal central zone classified under piedmont zone occupied by the Doon gravels, having primary porosity and permeability, is forming the main aquifer in the area. The groundwater is present in aquifers under unconfined and confined conditions. The course and gravels underlain by clay beds is the main water bearing strata. The zone is characterized by high infiltration rate. The Siwalik Zone the water is present under confined conditions and the water table is relatively deep.

Geology of the Area

The synclinal trough shaped Doon Valley bounded by the rocks of the Lesser Himalayan formations in north and Siwalik in south, forms a part of the sub-montane region of the Garhwal Himalaya. Geologically the valley is divided into:

The Lesser Himalaya: Mussoorie mountain range in northwest and northeastern parts. It comprises rocks of the Jaunsar (Chandpur phyllites and Nagthat quartzites) and Mussoorie Group (shales, sandstone, greywacks, calcareous slates, dolomite and limestone of Blaini-Krol_Tal sequence) of Proterozoic-Cambrian age.

A synclinal structural depression: filled with coarse clastic/ River Borne Material (RBM) consisting fan deposits of late Pleistocene and Holocene age known as the Doon Gravels. The Doon Gravels have been further subdivided into Oldest, Younger and Youngest Doon Gravels (Nossion, 1971; Meijerink; 1974). The Oldest Doon Gravesls resting over the Upper and Middle Siwalik beds and at places directly over Chandpur phyllites are consist of poorly sorted pebbles and gravels set in sandy matrix and red clays. The Oldest Doon Gravels consist partly of crushed Upper Siwaliks cobbles, angular pebbles of quartzites, slates and shales from the Nagthat, Chandpur and Tal Formations and limestone pebbles from the Krol Limestone alternating with clay beds. The Younger Doon Gravels, resting unconformably over the Oldest Doon Gravels in northern part, are characterized by very large boulders present in debris flow and braided river deposits. The unit consist of poorly sorted mixture of clay, sands, gravels and large bounders. The major part of the valley is occupied by Younger Doon Gravels occurring in the form of large fans, formed by reworking of Oldest Doon Gravels, and are called as Principal Doon fans. The Youngest Doon Gravels are braided river deposits and sub-recent terrace deposit along Asan and Song River. A number of coalesced fan have also descend down from the Siwalik range forming "Piedmont zone", are also part of youngest Doon Gravels.

The Siwalik range in the south comprises the middle and Upper Siwalik. The rocks of the middle Siwalik have the characteristic facies of continental deposits of large low land rivers and consist of friable medium grained grey coloured sandstone rich in micaceous minerals with mudstone. The rocks of the Upper Siwalik indicate a change in the region of the large braided rivers and are characterized by alternate polymictic conglomerate and subordinate grey micaceous sandstone (Tandon *et al.,* 1988). The conglomerate consists of well rounded to subrounded clasts of white, pink and grey quartzite, granite, phyllites and rare limestone.

Exploration:

No, exploration was carried out as the minerals are abundant in the proposed lease area.

Estimation and Categories of reserve:

The method of cross section has been adopted for computing the geological reserve. The mining lease boundary & mining limits are marked on the plans. The intersectional volume between two section lines has been determined by the following manner:

V= (S1+S2)/2 x L, where

V= volume

S1 & S2= Sectional area of the mineral body

L=Strike influence

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The mining lease has been applied only in river bed area. Geological reserves have been estimated through geological cross sections. The strike influence of sections is 52m to 70m. The area of each section line is calculated and sectional area is multiplied by the strike influence in between two section line to give the volume of each section line. The incidence of RBM has been taken as 70% of the total volume considering rest 30% as waste and would be used as backfilled material for reclaiming the excavated benches. While computing the geological mineral reserves the depth of mineralization is taken upto 18m in all the applied area.

There are three categories of reserve; namely measured/proved, indicated/probable, inferred/possible. The proved categories include mineral upto 9 m depth. The probable category includes 6 m after the proved depth and possible category includes 3 m from the possible depth as far as this lease in concerned.

The proved reserve, probable reserves & possible reserves are 3563178.26 tonnes, 2375451.67 tonnes & 1187726.60 tonnes respectively.

Following tables show the calculation of different categories of reserve:

Measured/Proved Reserve

Section Line	Sectional area (m^2)	Strike influence (m)	Volume $(m)^3$	Recoverable reserves (tonnes)
LB to 1-1'	9372.92	54	354296.38	708592.75
1-1' to 2-2'	20124.9	52	732546.36	1465092.72
2-2' to 3-3'	12670.83	70	620870.67	1241741.34
3-3' to END	1918.85	55	73875.73	147751.45
	44087.5		**1781589.13**	**3563178.26**

Indicated/Probable reserve

Section Line	Sectional area (m^2)	Strike influence (m)	Volume $(m)^3$	Recoverable reserves (tonnes)
LB to 1-1'	6248.61	54	236197.46	472394.92
1-1' to 2-2'	13416.60	52	488364.24	976728.48
2-2' to 3-3'	8447.22	70	413913.78	827827.56
3-3' to END	1279.23	55	49250.36	98500.71
	29391.66		**1187725.83**	**2375451.67**

Inferred /Possible reserved

Section Line	Sectional area (m^2)	Strike influence (m)	Volume $(m)^3$	Recoverable reserves (tonnes)
LB to 1-1'	3124.31	54	118098.92	236197.84
1-1' to 2-2'	6708.30	52	244182.12	488364.24
2-2' to 3-3'	4223.61	70	206956.89	413913.78
3-3' to END	639.62	55	24625.37	49250.74
	14695.84		**593863.30**	**1187726.60**

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Category according to UNFC classification

Reserves	UNFC code	Geological Reserves (tonnes)	Grade
Proved	131	3563178.26	Road, Bridges and building construction
Probable	232	2375451.67	Road, Bridges and building construction

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CHAPTER - 4

MINING

Mining (Past)

The present topography shows some depositional and erosion or mining activity during past years. Infect mining pits if any, are replenished every year during the rainy season. The lease area has gentle slope towards northwest. Highest point is at 480 m RL in the southeast corner of the area where as lowest point 467 m RL is in the northwest corner of the area.

Proposed Method of Mining

Applied area is a part of a river bed and mining will be done manually in open cast method in quite a systematic manner by forming benches of 1.5m high. However, there may be variation in the width which the lessee will keep on mending. About 250,000 Tonnes mineral will be exploited per year. From first year to fifth year total 1250,000 Tonnes mineral will be produced. The proposed area is within river bed and mined out area will be replenished gradually during succeeding rainy season. The sandy soil to be scrapped manually with the help of pickaxe, spade & crowbar and will be stacked separately in dump yard located near the working pit. About 30% of the total production is considered as a waste material and will be used for reclaiming the bank slope. Backfilling will be done simultaneously in each year.

Prior to any actual mining being done at the site, it is necessary to remove overburden from the top of the RBM. Overburden is sandy soil or subsoil that is mainly composed of silty sand. Sandy soil will be kept separate and used on top of the berms once they have reached their final elevation. The berms have multiple purposes; they provide storage for overburden until the mine is reclaimed, they provide a visual barrier between the active mine and roads or adjoining properties, they screen light position should the mine be operated after dark and they act as a noise barrier.

Once the overburden has been removed the sand, bajri and boulder is excavated depending upon the lithological variation, no blasting may be used to make the sand containing material more amenable to excavation. Excavation is typically performed by manual means. Hand operated tools like spade; tasla etc will be used to collect the sand. The excavated material may be directly loaded into trucks, dumpers, tippers and tractors trolleys and send to the destination wherever it is required for construction and other purposes.

Transportation of sand, bajri and boulder from the mine is a process to deliver mined out material to the location where it is going to be collected. Mined out sand, bajri and boulder will manually be loaded into truck and transported to its destination where it will ultimately be used. Sufficient space will be left for loading of trucks. Excavation of river bed minerals will commence from the top surface of the area and commence towards down removing the minerals manually in 1.50m slices. Ultimate depth of a bench will be 1.5m. Mining will be restricted upto a maximum depth of 1.5m only. The entire area does not require excavating at once. Per year about 250,000 tonnes production of river sand, bajri and boulder have been proposed to meet the market requirement.

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The mineral extraction will be done for a period of 225 days in a year. During this period the areas of mining quarry will be free from submergence. During mining operation the river flow will be away to enable dry pit mining. In the lease area the river flow being reduced and sediment load get deposited. During flood season, the area gets replenished with sediments and source of erosion at this location is comparatively less.

The guidelines of the Ministry of Environment & Forests and Directorate of Geology and Mining will be followed; the most important is as under:

· Dry pit mining will be followed which means mining an all times will be above the flowing river water level. Mining activity will be immediately stopped when water comes in the mining pits.

· Sand, bajri and boulder will be collected in slices upto a depth of 1.5 m or river water level whichever less than prescribed.

· Stream will not be diverted to form inactive channel.

· Mining at the concave side of the river channel will be avoided to prevent bank erosion.

· Mining will be restricted minimum 7.5m (UPL) from lease boundary to minimize effect of river bank erosion and to avoid consequent channel migration. Plantation will be done on such area to isolate mining operation form the rest of the area.

· Area of mining lease will be demarcated prior to mining for sustainable development and Pillars will be erected on ground.

· No mining operations shall be carried out in proximity of any bridge and or embankment.

Proposed Rate of Production and Life of Mine

Depending upon the market about 250,000 tonnes per annum of river sand, bajri and boulder is proposed to be swiped out from the mining area. This material will be expected to be replenished during the next rainy season.

Year Wise Mining & Development

Area does not show any outcrop of in-situ deposit. The production is generally in the form of sand, bajri and boulder. The general recovery of the river sand, bajri and boulder is about 70% has been considered as per our past experience. Tonnage factor of 2.0 has been considered. Thus, total saleable quantity in tonnes will be around 1250,000.

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I Year:

The mining face will be started from NW to SE direction from the lower level and advance towards higher levels. During this year mining is proposed from RL 467m to RL 475.5m to open the mining faces and transportation of mineral. Backfilling will be done upto RL 474m.

The sandy soil will be removed from river bank with the help of crowbar & spade and stacked separately. Each bench will be of 1.5m high with 0.75m high sub benches. The net recovery of RBM has been considered 70% of total excavation. The net saleable production of RBM will be 250,000 Tonnes. The bench wise proposed quantity, production and closing recoverable reserves are given below:

Bench Level (m)	Quantity of the mineral (Tonnes)	Production (Tonnes)	Balance (Tonnes)
467	7864.07	500	7364.07
468	40053.32	25000	15053.32
469.5	91145.04	45000	46145.04
471	50071.88	30000	20071.88
472.5	54570.87	44500	10070.87
474	138630.77	75000	63630.77
475.5	98054.46	30000	68054.46
Total	**480390.41**	**250000**	**230390.41**

The position of benches in I year is shown in Plate No.4.

II Year:

As mentioned that the mined out area will be replenished during the monsoon season and the mineral will be filled back over the mined out pit. During this year mining is proposed from RL 468m to RL 477m to open the mining faces and transportation of mineral. The mining face will be advance towards SE. Backfilling will be done upto RL 475.5m. Tonnage factor of 2.0 has been considered. Thus, total saleable quantity in Tonnes will be 250,000.

The sandy soil will be removed from river bank with the help of crowbar & spade and stacked separately. Each bench will be of 1.5m high. The net recovery of RBM has been considered 70% of total excavation. The bench wise proposed quantity, production and closing recoverable reserves are given below:

Bench Level (m)	Quantity of the mineral (Tonnes)	Production (Tonnes)	Balance (Tonnes)
468	40053.32	22000	18053.32
469.5	91145.04	44000	47145.04
471	50071.88	28500	21571.88
472.5	54570.87	40500	14070.87
474	138630.77	75000	63630.77
475.5	98054.46	25000	73054.46
477	49545.99	15000	34545.99
Total	**522072.33**	**250000**	**272072.33**

The position of benches in II year is shown in Plate No.5.

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III Year

As mentioned that the mined out area will be replenished during the monsoon season and the mineral will be filled back over the mined out pit.

The mining face will be advance from NW to SE. During this year mining is proposed from RL 467m to RL 478.5m to open the mining faces and transportation of mineral. Backfilling will be done upto RL 477m.

The sandy soil will be removed from river bank with the help of crowbar & spade and stacked separately. Each bench will be of 1.5m high. The net recovery of RBM has been considered 70% of total excavation. The net saleable production of RBM will be 250,000 Tonnes. The bench wise proposed quantity, production and balance reserves are given below:

Bench Level (m)	Quantity of the mineral (Tonnes)	Production (Tonnes)	Balance (Tonnes)
467	7864.07	500	7364.07
468	40053.32	20500	19553.32
469.5	91145.04	38000	53145.04
471	50071.88	22000	28071.88
472.5	54570.87	38000	16570.87
474	138630.77	63000	75630.77
475.5	98054.46	28000	70054.46
477	49545.99	20000	29545.99
478.5	70305.84	20000	50305.84
Total	**600242.24**	**250000**	**350242.24**

The position of benches in III year is shown in Plate No.6.

IV Year

As mentioned that the mined out area of III year will be replenished during the monsoon season and the mineral will be filled back over the mined out pit. The mining face will be advance towards SE. During this year mining is proposed from RL 468m to RL 477m to open the mining faces and transportation of mineral. Backfilling will be done upto RL 475.5m.

The sandy soil will be removed from river bank with the help of crowbar & spade and stacked separately. Each bench will be of 1.5m high. The net recovery of RBM has been considered 70% of total excavation. The net saleable production of RBM will be 250,000 Tonnes. The bench wise proposed quantity, production and closing recoverable reserves are given below:

Bench Level (m)	Quantity of the mineral (Tonnes)	Production (Tonnes)	Balance (Tonnes)
468	40053.32	19000	21053.32
469.5	91145.04	45000	46145.04
471	50071.88	28000	22071.88
472.5	54570.87	38000	16570.87
474	138630.77	72000	66630.77
475.5	98054.46	30000	68054.46
477	49545.99	18000	31545.99
Total	**522072.33**	**250000**	**272072.33**

The position of benches in IV year is shown in Plate No.7.

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V Year

As mentioned that the mined out area of IV year will be replenished during the monsoon season and the mineral will be filled back over the mined out pit. The mining face will be advance from NW to SE. During this year mining is proposed from RL 467m to RL 478.5m to open the mining faces and transportation of mineral. Backfilling will be done upto RL 477m.

The sandy soil will be removed from river bank with the help of crowbar & spade and stacked separately. Each bench will be of 1.5m high. The net recovery of RBM has been considered 70% of total excavation. The net saleable production of RBM will be 250,000 Tonnes. The bench wise proposed quantity, production and balance reserves are given below:

Bench Level (m)	Quantity of the mineral (Tonnes)	Production (Tonnes)	Balance (Tonnes)
467	7864.07	500	7364.07
468	40053.32	18000	22053.32
469.5	91145.04	42000	49145.04
471	50071.88	22500	27571.88
472.5	54570.87	36000	18570.87
474	138630.77	62000	76630.77
475.5	98054.46	26000	72054.46
477	49545.99	18000	31545.99
478.5	70305.84	25000	45305.84
Total	**600242.24**	**250000**	**350242.24**

The position of benches in V year is shown in Plate No.8.

Ultimate pit limit and life of the mine:

About 32.709 ha area will be available for the production of RBM up to the life of the mine. The proposed area is within river bed and mined out area will be replenished gradually during succeeding rainy season. Hence there will be no change in land use, land cover or topography of the area. Mining will be undertaken through manually. The height and width of the mining faces will be kept 1.5m each and ultimate pit slope will be 45^0. The existing track will be used for the opening of the faces and transportation of mineral. The waste material will stack separately and will be kept in the earmarked stack site. Mineable reserve of the area is calculated with the help of slices (Plate-11) are tabulated below:

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Mineable reserve

Bench Level (m)	Area of Bench $(m)^2$	Depth (m)	Volume $(m)^3$	Recoverable Reserves $(m)^3$	Recoverable Reserves (Tonnes)
1	*2*	*3*	*4*	*5*	*6*
467	5617.19	1.5	5617.19	3932.03	7864.07
468	19073.01	1.5	28609.52	20026.66	40053.32
469.5	43402.40	1.5	65103.60	45572.52	91145.04
471	23843.75	1.5	35765.63	25035.94	50071.88
472.5	25986.13	1.5	38979.20	27285.44	54570.87
474	66014.65	1.5	99021.98	69315.38	138630.77
475.5	46692.60	1.5	70038.90	49027.23	98054.46
477	23593.33	1.5	35390.00	24773.00	49545.99
478.5	33478.97	1.5	50218.46	35152.92	70305.84
Total	**287702.03**		**428744.45**	**300121.12**	**600242.23**

Conceptual Mine Plan and Life of Mine

The lease is moderate in size. A 7.5m wide strip has been left all along the lease boundary as a statutory condition. No sand, bajri and boulder will be collected from the proximity of any bridge/embankment. Collection of sand, bajri and boulder is restricted up to a maximum depth of 1.5m. River/stream will not be diverted in any case. No mining is proposed during rainy season. A quantity of material about 1111 tonnes per day ROM has been proposed to collect during the course of mining. This will be replenished during the next rainy season. Area has sufficient material for the next coming 5 years. The ultimate plan is shown in Plate No. 10.

Afforestation:

The entire mining lease area being a part of river bed, there is no vegetation in the leased out area. Hence there would be no clearance of existing land and vegetation. Plantation will be done on both side of river bank for stabilising the slope.

Infrastructure:

Track having width 3.0m and gradient varies 1:20 to 1:50 will be made for different working pits and up to sandy soil stack. The entire mining lease area being a part of river bed, there is no buildings in the leased out area. Hence there would be no clearance of existing land.

Backfilling:

The mining will be undertaken on the river bed. The mined out pit will be restored by backfilling of waste material (sandy soil). The final backfilling can be started once the ultimate benches are formed and mineral is completely excavated. However the mined out area will be replenished during the monsoon season and the mineral will be filled back over the mined out pit itself.

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CHAPTER – 5

USE OF MINERAL:

The RBM containing sand bajri & boulders of quartzite mineral is an important material for construction. The RBM will be used in road, bridge and building constructions.

CHAPTER – 6

MINE DRAINAGE:

The deposit is situated in the river bed in Doon valley and has a moderate to heavy rainfall. The maximum highest RL is about 480 m on the south east part of the area, while the lowest RL recorded on the northwest part of the area is about 467m and general slope is towards southwestern direction.

CHAPTER – 7

STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:

The top RBM containing sandy soil will be removed with the help of pickaxe, spade & crowbar and stacked separately. Part of these rejects will be utilized in construction and maintenance of retaining walls.

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CHAPTER - 8

OTHER

Site Services

The following site services will be provided:

(i) Office
(ii) Store
(iii) First Aid Centre
(iv) Drinking water shed
(v) Rest shelter

Employment Potential

The mine manager should be a graduate engineer holding at least second class manager's certificate.

The category-wise employments are given as below:

Manager/Foreman	:	1
Skilled		
Supervisor	:	2
Time Keeper	:	1
Office Assistant/Dispatch Supervisor	:	1
Un-skilled		
Daily wages/mining workers	:	136
Total	**:**	**141**

The services of following persons/agencies may be retained on part time basis.

(i) Environment consultancy agency
(ii) Consultant Mining Engineer (Part-time) degree in Mining
(iii) Mining Geologist
(iv) Mines Surveyor

CHAPTER - 9

BENEFICIATION:

No beneficiation of mineral processing will required for sand, bajri and boulders. There for no such investigations have been conducted.

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CHAPTER - 10

ENVIRONMENT:

Land use:

Land degradation and ecological disturbances generally occurs in open cast mining. In preparation of mining plan in River Asan, Lot No. 14/6 for sand, bajri & boulders mine of M/s Garhwal Mandal Vikash Nigam Ltd., emphasis on environmental protection has been given to minimize the adverse impact on the present environmental status. Opencast method of mining causes some land degradation and disturbs the ecology of the area. While preparing the Environment Management Plan (EMP) emphasis has been laid on restoring the ecology of the area as much as is possible. Applied area is almost barren but at places covered with thin grasses. This has been made possible by planning the mine workings in the most systematic, safe and scientific manner with due regard to conservation of mineral.

Water regime:

The ground water table in this valley region is at shallow depth below ground surface and hence ground water may interfere in opencast mining below1.5m depth.

Flora and fauna

Area supports moderately healthy vegetation, the main forest species are along the Shiwalik foothills. These Terai plains support the species of Sisam, Arjuna, Kanji, Khair, Sagaun, Neem, Eucalyptus, Babul etc. Ground vegetation mainly consists of grasses and small shrubs. Useful fodder grasses, *Cynodon dactylon, Eleusine indca, Trifolium alexandrinum* etc. can be seen growing in the area. The large weeds which infest uncultivated tracts are Aak (*Calotropis procera*), Castor (*Ricinus communis*), Dhatura (*Datura metel*) and thorn (*Opuntia stricta*). Other noxious weeds and those which appear in crops are Pohli or Thistle (*Carthamus oxyacantha*), Shial Kanta (*Argemone Mexicana*), Kandyari (*Solanum xanthocarpum*), Parthenium hysterophorus and Bhag (*Cannabis sativa*).

The core Zone of Tons River where mining operation is proposed consists of riparian vegetation in which aquatic and marshland plants are the main component. Most among them are weeds. No ecologically sensitive plant species has been reported from this area. Riparian vegetation is found along the river side. In stagnant water growth of hydrophytes like *Hydrolea zeylanica, Ipomoea carnea, Ludwigia adscendens, Sagittaria sagittifola, Spilanthes paniculata, Typha latifoli,* etc can be commonly observed. Buffer zone of the applied area is Doon Valley and foothills of Siwalik and tree species observed in the area are, Aam, Jamun, Bail, Bakain, Bargad, Neem, Peepal, Popular, Safeda and Sisam etc.

Shrubs: *Calotropis procera*, with a few *Datura innoxia* and *Ipomoea carnea* etc. occurs in the depressions.

Herbs: Ageratum conyzoides, Amaranthus spinosus, Cannabis savita and Hydrolea zeylanica.

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Quality of air, ambient noise level and water

Mining activities includes excavation and lifting of minerals. The proposed mining activity is manual in nature. No drilling and blasting is envisaged for the mining activity. Hence the only impact anticipated is due to movement of vehicles deployment for transportation of minerals.

Water quality:

The surface drainage system in the area is perennial. The flow in the natural drain is observed more after the rainfall. Drinking water quality will not deteriorate by mining and allied activities.

Climatic condition:

Rainfall: Dehradun valley is characterized by humid climate with moderate temperature, rainfall and luxuriant vegetation. The total annual rainfall in the area varies from 2073.3mm to 2876 mm. Maximum rainfall seems during July and August. On an average there are about 48 rainy days in a year.

Temperature: Mean Maximum temperature varies from 36.2° to 42^0 and the mean minimum temperatures 6.1° to 19.1°C. In association with the cold waves arising in the wake of the western disturbance which travels East wards, the minimum temperature goes down to about 3^0 and at times leads to frosts. Humidity recorded maximum during July (85%).

Socio-Economics:

Social and demographic profile:

The scale of operation is medium to small. It is expected that 90% employment will be local. Therefore there will be positive impact on socio-economic status of people.

Historical monuments etc

There is no historical building in and around the lease area.

Programme of afforestation:

Plantation is proposed along the slope on both bank of the river. Rehabilitation of extracted land has to be designed skilfully in order to restore it to its formal use, or to an alternative use that is compatible with the surroundings. Plantation with grasses, herbs, shrubs and trees is an important means for restoring such areas.

Stabilizing and re-vegetate the de-vegetated areas viz. debris, dumps and slopes which get degraded due to vehicle movement, rolling stones, etc are important for conservation of soil, regulation of surface and underground water and for rehabilitation of wild life habitat. These generally are extracting operations and need planting in various phases by select species. Protective engineering measures, in conjunction, become necessary.

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Top layer of RBM having some sandy soil is considered as an overburden and will be stacked separately and nature of this dump will be temporary. Mining pits will be backfilled from first year onwards in the proposed pit. Soil will be spread over the benches.

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CHAPTER - 11

CLOSURE PLAN:

Mined Out land:

Plantation is proposed along the slope on both bank of the river. The mining will commence from the lower levels and will advance towards higher levels. Intermittent backfilling will commence from the lower levels and subsequently advance, towards the higher elevations. The year wise proposal for reclamation is shown in Plate No. - 4 to 8.

Water Quality Management:

The mineral as well as soil are non-toxic and mining is also proposed at medium to small scale. Hence no proposal has been provided for the surface and ground water bodies. The expected depth of water table in applied area likely to be more than the exploitation depth.

Air Quality Management:

The lease area is situated in the river bed. The manual mining without drilling and blasting has been proposed. Therefore the impact on air environment will be negligible. Mining and allied activities are going on a comparatively small scale; the existing air is absolutely clean.

Waste Management:

The RBM containing sandy soil will be stacked separately and these dumps are temporary in nature. The dumping will be undertaken manually. The toe wall having width 1.5m and height 1.0m will be made along the side and slope of the soil and width & height 1.5m each retaining wall for protecting RBM dump to avoid the wash off material during intermittent rains.

Infrastructure:

In river bed sand, bajri and boulders is manual open cast mining. No mechanization is required. The tracks having width of 3.0m and gradient 1:20 to 1:50 will be made for the advancement of mining faces and for the transportation of RBM and waste material. There will not be any changed in existing infrastructure.

Disposal of Mining Machinery:

The sand, bajri and boulders mine is manual open cast. Hence disposal of mining machineries are not required.

Safety and Security:

Each worker employed in the mine will be provided helmets and shoes. Safety belts will be used for working in the top of the benches.

Therefore protective works like parapet walls, garland drains shall be provided before the mine/pit is abandoned.

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Disaster management and risk assessment:

At present the mining is proposed in a mild sloping *nap* land in river bed. When the mining will reach up to the optimum economical depth then backfilling will commence to restore the topography of the area. The mining faces shall be dressed properly because any hanging boulders/loose material may create fatal accidents to the labourers while working in the pit. The mine shall be critically examined for its proneness to any natural hazard and assessment regarding danger of hazard and precautions to be taken and should be reviewed so that chances of slope failures will be minimized.

CHAPTER - 12

CONCLUSION:

This applied area is suitable for producing material for making road, bridge, buildings and other constructional work. This is a part of Govt. of India's policy to develop maximum infrastructure facility in India. This making of road or bridge will generate direct & indirect employment to the local people. GMVN Ltd. will undertake mining activity as per the plan indicated in the above chapters with proper taking care of environmental aspects i.e. without disturbing the ambient condition.

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भूतत्व एवं खनिकर्म इकाई,
उद्योग निदेशालय उत्तराखण्ड भोपालपानी, देहरादून
संख्याः 58 भू0खनि0ई0 / 2012–13, दिनांकः 23 जनवरी, 2013

कार्यालय ज्ञाप

उत्तराखण्ड खनिज नीति 2011 के बिन्दु–2 के प्रस्तर–1 के अनुसार राज्य के राजस्व नदी उपखनिज क्षेत्रों में उपखनिज के चुगान के खनन पट्टे गढ़वाल मण्डल क्षेत्र में गढ़वाल मण्डल विकास निगम को उत्तराखण्ड उपखनिज परिहार नियमावली 2001 के नियमानुसार निर्धारित प्रपत्र एम0एम–1 में आवेदन करने के उपरान्त 05 वर्ष हेतु स्वीकृत किये जाने का प्राविधान के दृष्टिगत गढ़वाल मण्डल क्षेत्र के राजस्व नदी उपखनिज क्षेत्रों में उपखनिजों के चुगान का खनन पट्टा चाहने हेतु आवेदक प्रबन्ध निदेशक, गढ़वाल मण्डल विकास निगम, देहरादून द्वारा प्रस्तुत आवेदन पत्रों के सम्बन्ध में इस आशय पत्र (Letter of Intent) के माध्यम से राज्य सरकार आवेदक प्रबन्ध निदेशक, गढ़वाल मण्डल विकास निगम लि0 के पक्ष में उनके द्वारा आवेदित क्षेत्रों यथा जनपद देहरादून के 88 उपखनिज लॉटों तथा जनपद हरिद्वार के 28 उपखनिज लाटों में पौड़ी के 8 एवं जनपद टिहरी गढवाल के 29 उपखनिज लॉटों जिनका विवरण तालिका–1,2,3, व 4 में निम्नवत् उल्लिखित है, को में 05 (पांच) वर्ष की अवधि हेतु उपखनिज चुगान का खनन पट्टा स्वीकृत करने की मंशा रखती है:–

जनपद देहरादून के खनन क्षेत्र–

क्र0सं0	नदी का नाम	लॉट न0	क्षेत्रफल (है0)
1.	टौंस नदी	3/1	1.960
2.		3/2	3.970
3.		3/3	2.910
4.		3/4	7.280
5.		3/5	1.700
6.		3/6	16.770
7.		3/8	15.363
8.		टौंस कैन्द	37.002
9.		3/9	3.963
10.		3/10	23.000
11.		3/11	11.100
12.		3/12	46.931
13.		3/13	6.000
14.		3/14	7.700
15.		4/2	4.720
16.		4/3	3.140
17.		4/4	1.100
18.		4/5	9.590

20.	रिस्पना नदी	4/7	3.290
21.		4/8	17.460
22.		4/9	11.740
23.		4/10	9.600
24.		4/11	5.810
25.	बांदल नदी	6/1	7.848
26.	सौंग नदी	7/1	3.123
27.		7/2	156.700
28.		सौंग कैन्ट	56.576
29.	नून नदी	8/1	23.030
30.		8/2	16.790
		8/3	50.069
		8/4	19.668
	बिन्दाल नदी	9/1	6.660
		9/2	40.480
		9/3	5.796
		9/4	20.631
	बिन्दाल कैन्ट		4.000
	नागलराव नदी	10/1	27.770
		10/2	5.983
	कालीगाढ़ नदी	11/1	3.437
	नलोटा नदी	11/2	6.269
	सुसवा नदी	12/1	8.316
43.		12/2	262.114
44.		12/3	42.435
45.	जाखन नदी (रानीपोखरी कैन्ट)	13/1	38.891
46.	जाखन नदी(माजरी कैन्ट)	13/2	82.340
		14/1	19.000
		14/2	21.094
		14/3	88.610
		14/4	35.405
		14/5	32.218
52.	आसन नदी	14/6	32.709
53.		14/7	4.000
54.		14/8	32.000
55.		14/9	45.000
56.		14/10	62.000
57.		14/11	31.000

दिनांक 26 जुलाई, 2012 में दिये गये निर्देशानुसार E.I.A Notification, 2006 के अन्तर्गत पर्यावरणीय स्वीकृति प्राप्त कर, पर्यावरणीय स्वीकृति की प्रति इस कार्यालय को प्रस्तुत करना सुनश्चित करें, ताकि नियमानुसार खनन पट्टा स्वीकृति हेतु अग्रेत्तर कार्यवाही की जा सकें।

भवदीय,

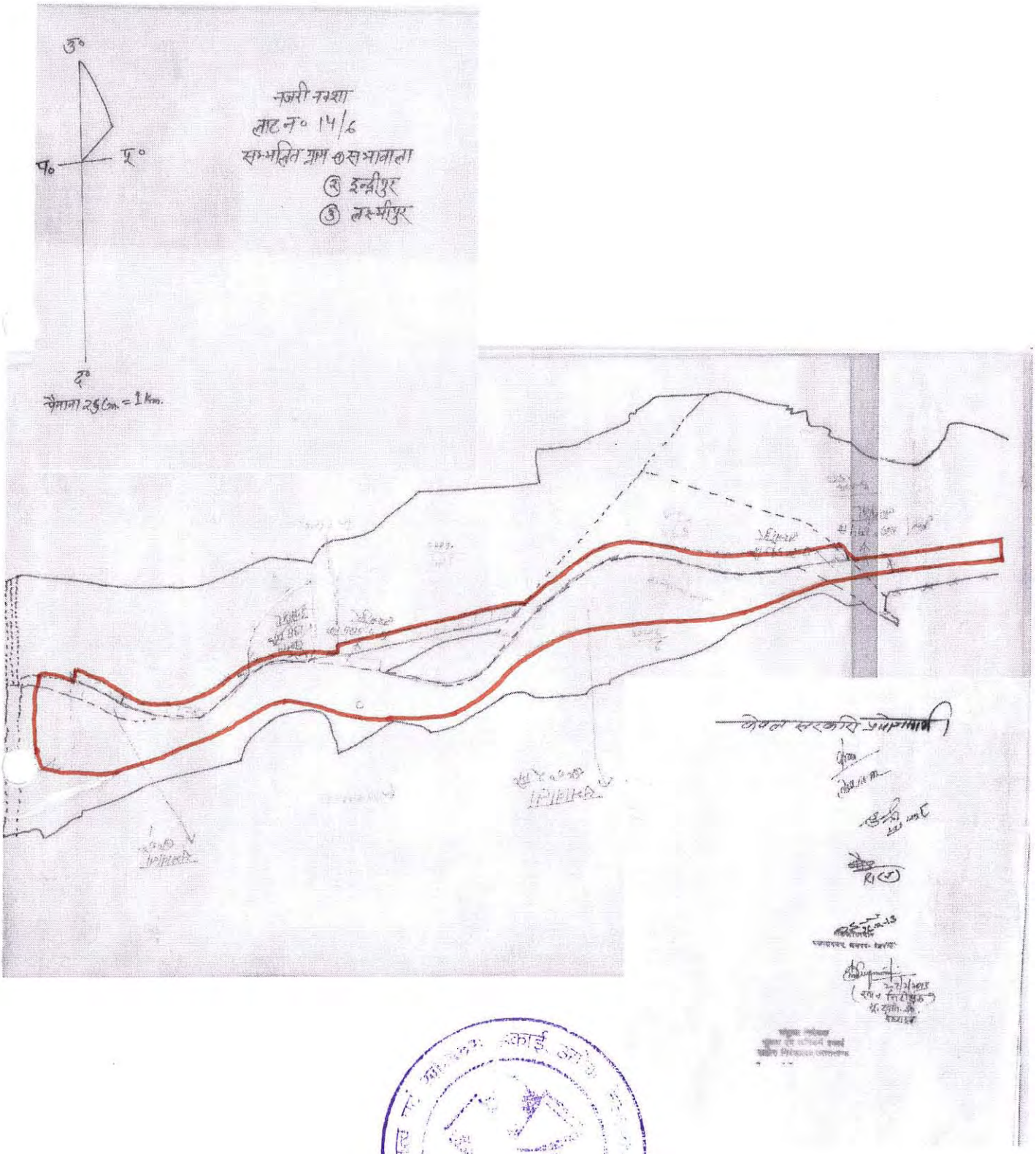
(शैलेश बगौली)
निदेशक,

पृष्ठांकन संख्याः (1)/तद्दिनांकित।
प्रतिलिपिः निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. प्रमुख सचिव, औद्योगिक विकास विभाग, उत्तराखण्ड शासन।
2. जिलाधिकारी, देहरादून/हरिद्वार/पौड़ी/टिहरी गढ़वाल।
3. प्रबन्ध निदेशक, गढ़वाल मण्डल विकास निगम लि0, देहरादून को इस आशय से प्रेषित कि E.I.A Notification, 2006 के अन्तर्गत पर्यावरणीय स्वीकृति प्राप्त कर इस कार्यालय को उपलब्ध कराना सुनिश्चित करें।
4. गार्ड फाईल।

(शैलेश बगौली)
निदेशक,

Annexure-2


उ०
प०
पू०
द०
नजरी नक्शा
लाट नं० 14/6
सम्भवित ग्राम पंचायत
① इन्द्रीपुर
② लक्ष्मीपुर
पैमाना 2.5 Cm. = 1 Km.

Annexure-3

26-संयुक्त निरीक्षण रिपोर्ट

जिलाधिकारी महोदय देहरादून के पत्र संख्या 351/खनिज-नदी तल-2012 दिनाँक 16 अगस्त, 2012 तथा आदेश संख्या 390/खनिज/2012 दिनांक 30 अगस्त, 2012 एवं प्रमुख सचिव उत्तराखण्ड शासन के पत्र संख्या 2541/VII-11/146-ख/2009 दिनाँक 27 अक्टूबर, 2009 के अनुपालन में गठित समिति द्वारा जनपद देहरादून तहसील विकासनगर के ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर, सहसपुर स्थित आसन नदी तल जिसकी सीमाऐं ग्राम सहसपुर-सभावाला स्थित पुल से ऊपर ग्राम सभावाला, इन्दीपुर, लक्ष्मीपुर एवं सहसपुर के अन्दर तक का भाग है, का संयुक्त निरीक्षण दिनाँक 22.09.2012 को किया गया। खनन पट्टे हेतु आवेदित स्थल को राज्य सरकार में प्रचलित खनिज नीति-2011 के अनुसार सार्वजनिक स्थल पुल, नहर, सडक इत्यादि से 100-100 मीटर की दूरी छोडते हुये तथा नदी किनारे से नदी की चौडाई का 15% (प्रतिशत) भाग छोडकर उपखनिज खनन योग्य क्षेत्रफल सम्मलित किया गया है। जो निम्न प्रकार से है:-

क्र.सं.	जनपद	तहसील	ग्राम का नाम	नदी का नाम	लाट संख्या	खसरा नम्बर	कुल क्षेत्रफल (है.में)	खनन योग्य क्षेत्रफल	उपलब्ध उपखनिज
1	2	3	4	5	6	7	8	9	10
1.	देहरादून	विकासनगर	सभावाला, इन्द्रीपुर, लक्ष्मीपुर, सहसपुर	आसन नदी	14/क	2मि	36.7750	30.0000	रेत, बजरी,. बोल्डर (मिश्रित)
						1मि	2.2100	1.0000	
						585मि	1.3400	0.6000	
						593	0.8110	0.6090	
						594	1.0640	0.5000	
						कुल	42.2000	32.7090	

उपरोक्त प्रस्तावित उपखनिज सिविल नदी तल क्षेत्र में प्रचुर मात्रा में उपखनिज निक्षेपित है, जिसे राजस्व हित में खनन/चुगान किया जाना अति आवश्यक है। मौके पर उपस्थित वन विभाग, सिंचाई विभाग, खनन विभाग तथा राजस्व विभाग (गठित समिति के सदस्य/प्रतिनिधि) की आख्या निम्नवत् है:-

1.- <u>वन विभाग:-</u> वन विभाग के प्रतिनिधि श्री हीरा लाल वर्मा (आर.ओ.मल्हान) द्वारा अवगत कराया गया कि उप खनिज खनन/चुगान हेतु प्रस्तावित क्षेत्र सिविल भूमि है तथा वृक्षविहीन है, उक्त प्रस्तावित स्थल से स्थित वन की सीमा 03 किलोमीटर दूरी पर स्थित है। अतः उक्त प्रस्तावित राजस्व भूमि पर उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

2.- <u>सिचाँई विभाग:-</u> सिचाँई विभाग के प्रतिनिधि श्री डी.के.सिंह, सहायक अभियन्ता यान्त्रिक उपकरण एवं भण्डारण खण्ड प्रथम, सिंचाई विभाग द्वारा अवगत कराया गया कि प्रस्तावित स्थल पर वर्तमान में कोई निर्माण कार्य नही किया गया है। सहसपुर-सभावाला स्थित पुल से निर्धारित 100मीटर की दूरी छोडते हुये प्रस्तावित स्थल पर उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

3.- <u>भूतत्व एवं खनिकर्म विभाग:-</u> भूतत्व एवं खनिकर्म विभाग के प्रतिनिधि वीरेन्द्र कुमार सिंह, खान निरीक्षक देहरादून द्वारा उक्त प्रस्तावित स्थल पर प्रचुर मात्रा में उपखनिज रेत, बजरी, बोल्डर मिश्रित रूप में निक्षेपित है, जो प्रतिवर्ष वर्षाकाल में पानी के बहाव से एकत्रित होता रहता हैं। प्रस्तावित स्थल

एक तहत खण्ड में हैं तथा पहुँच मार्ग ग्राम लक्ष्मीपुर, सभावाला, रामपुर/सेन्ट्रल होट टाऊन से उपलब्ध है। अतः राजस्व हित में उपखनिज खनन/चुगान की अनुमति दिये जाने पर विभाग को कोई आपत्ति नही है।

4.- <u>राजस्व विभागः-</u> राजस्व विभाग के प्रतिनिधि श्री ऋषिपाल सिंह नेगी, श्री हीरा सिंह बिष्ट लेखपाल तहसील विकासनगर द्वारा अवगत कराया गया कि प्रस्तावित स्थल ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर एवं सहसपुर अन्तर्गत ख.न. 2मि, 1मि, 585मि, 593, 594 मध्य रकबा 42.2000है0 उत्तराखण्ड राज्य सरकार की भूमि है, जिसमें से खनन योग्य 32.7090है0 भूमि है। उक्त स्थल पर प्रचुर मात्रा में उपखनिज निक्षेपित है। अतः राजस्व हित में उक्त स्थल पर उपखनिज के खनन/चुगान की अनुमति दिये जाने पर कोई आपत्ति नही है।

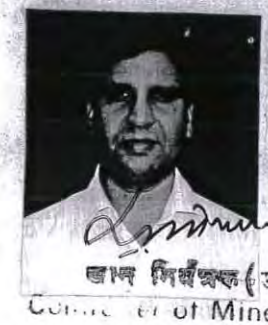
उल्लेखनीय है शासनादेश संख्या 922/VII-I/11-रिट/2012 दिनाँक 26 जुलाई, 2012 द्वारा राज्य के समस्त खनिज/उपखनिज क्षेत्रो के लिये खनन पट्टा स्वीकृत किये जाने से पूर्व पर्यावरण एवं वन मंत्रालय से पर्यावरणीय अनुमति प्राप्त करना आवश्यक है।

अतः उक्त के दृष्टिगत पर्यावरणीय स्वीकृति उपरान्त उक्त प्रस्तावित क्षेत्र को उपखनिज के खनन/चुगान के पट्टे पर दिये जाने हेतु संस्तुति की जाती है।

(हीरा लाल वर्मा)	(डी.के. सिंह)	(वीरेन्द्र कुमार सिंह)	(हर गिरी)
रेंज अधिकारी, मल्हान	सहायक अभियन्ता	खान निरीक्षक	तहसीलदार
वन विभाग	यान्त्रिक उपकरण एवं भण्डारण	भूतत्व एवं खनिकर्म विभाग देहरादून	विकासनगर

(अशोक कुमार पाण्डेय)
उपजिलाधिकारी
विकासनगर

Annexure-4



10/05/12

खान नियंत्रक (उत्तर)
Controller of Mines (North)
भारतीय खान ब्यूरो
Indian Bureau of Mines

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22 (c) of Mineral Concession Rules 1960)

Shri HARISH KAINTHOLA *resident of* 54, ANARWALA, DEHRADUN, UA, *son of* SHRI MADAN MOHAN SHARMA, *having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22 (c) of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.*

His registration number is RQP/DDN/141/2002 - A

This recognition is valid for a period of ten years ending 16.1.2012

Place: Dehradun

Date : 17.1.2002

Signature of RQP. (HK) 14/10/2011

Regional Controller of Mines
Indian Bureau of Mines

.....

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines

Annexure -5

AUTHORISATION LETTER

M/s Garhwal Mandal Vikas Nigam (GMVN) Ltd., has made an agreement (Letter no. 566/खनन dated 27 Oct.) regarding the preparation of mining plan of 67 lots at different locations in Uttarakhand. with Shri Harish Kainthola, RQP and here by authorize Shri Harish Kainthola (RQP No. RQP/DDN/141/2002-A) to prepare the Mining Plan in respect of Sabhawala, Indripur, Lakshmipur & Sahaspur, area in Asan river, Lot No. 14/6 (*khasra* No. 2मि, 1मि, 585मि, 593मि, 594मि), over an area of 32.709 ha for minor mineral, falls under Nap land in Village – Sabhawala, Indripur, Lakshmipur & Sahaspur, Tehsil- Vikasnagar, Distt. - Dehradun (Uttarakhand).

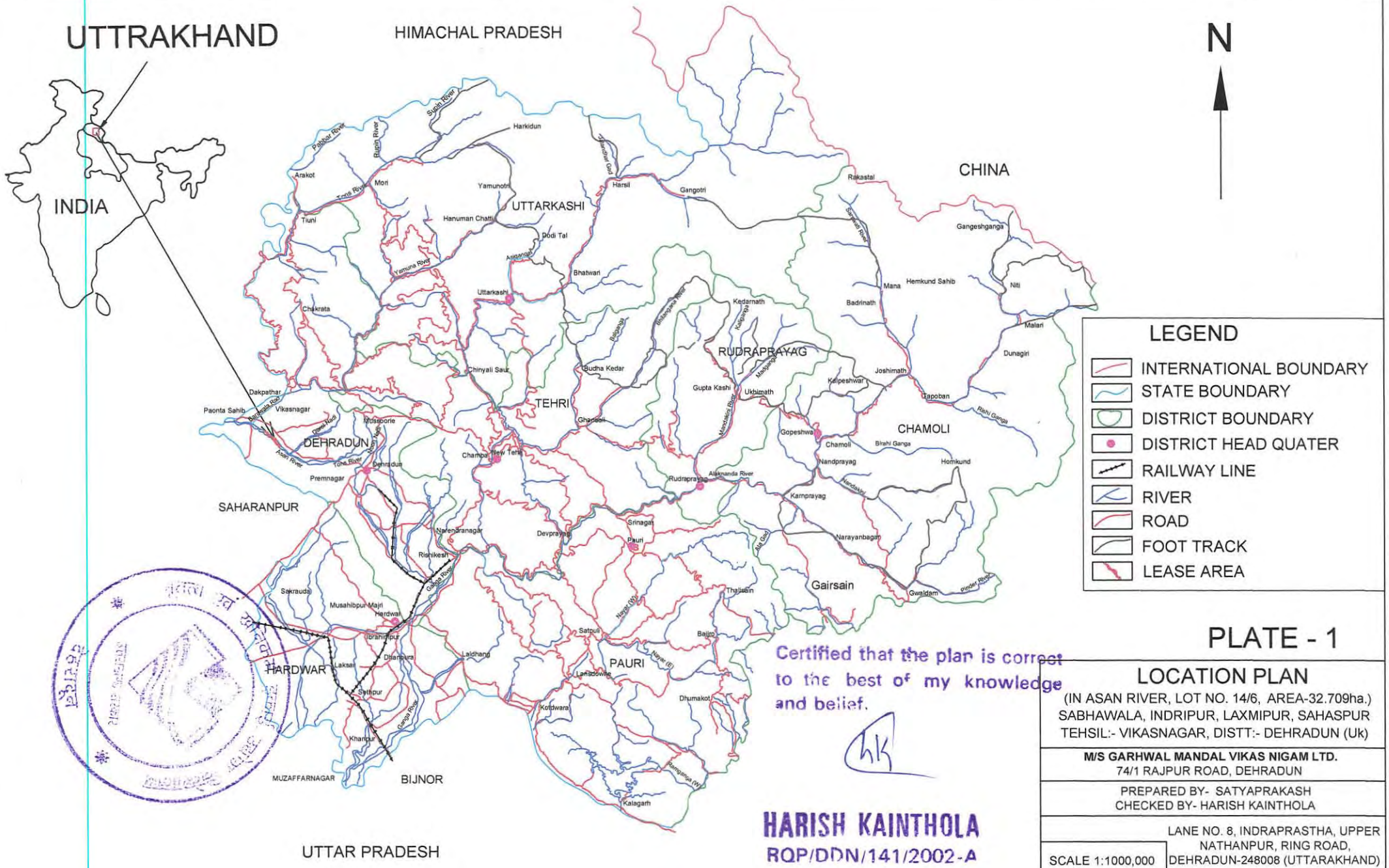
GMVN request the Director, Geology and Mining Unit, Directorate of Industry, Govt. of Uttarakhand, Dehradun to make further correspondence regarding modification of the aforesaid Mining Plan with the said recognized person on his following address:

Name of RQP : Shri Harish Kainthola
Registration No. : RQP/DDN/141/2002-A
Validity : (Valid upto 16th Jan, 2017)

प्रभारी अधिकारी (खनन)
ग०मं०वि०नि०लि०, देहरादून

Address of RQP

Lane No. 8,
Indraprastha, Mussoorie Bye pass road,
Upper Nathanpur, P.O. Nehrugram- 248008,
Dehra Dun (Uttarakhand)
Telephone: 09412028745(Office),
8410411206 (Cell)
E- mail: hkainthola@gmail.com



LEGEND

- INTERNATIONAL BOUNDARY
- STATE BOUNDARY
- DISTRICT BOUNDARY
- DISTRICT HEAD QUATER
- RAILWAY LINE
- RIVER
- ROAD
- FOOT TRACK
- LEASE AREA

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

PLATE - 1

LOCATION PLAN

(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

M/S GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- SATYAPRAKASH
CHECKED BY- HARISH KAINTHOLA

SCALE 1:1000,000

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

N

Asan River

Rampur Chhata

Sabhawala

Kalyanpur

270

INDEX

- RBM (DOON GRAVEL) *QUATERNARY*
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- RIVER
- GEOLOGICAL SECTION LINE (1 1')
- SETTLEMENT
- BOULDER

Scale 20 20 60 100m (0 40 80)

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

PLATE - 2

SURFACE GEOLOGICAL MAP

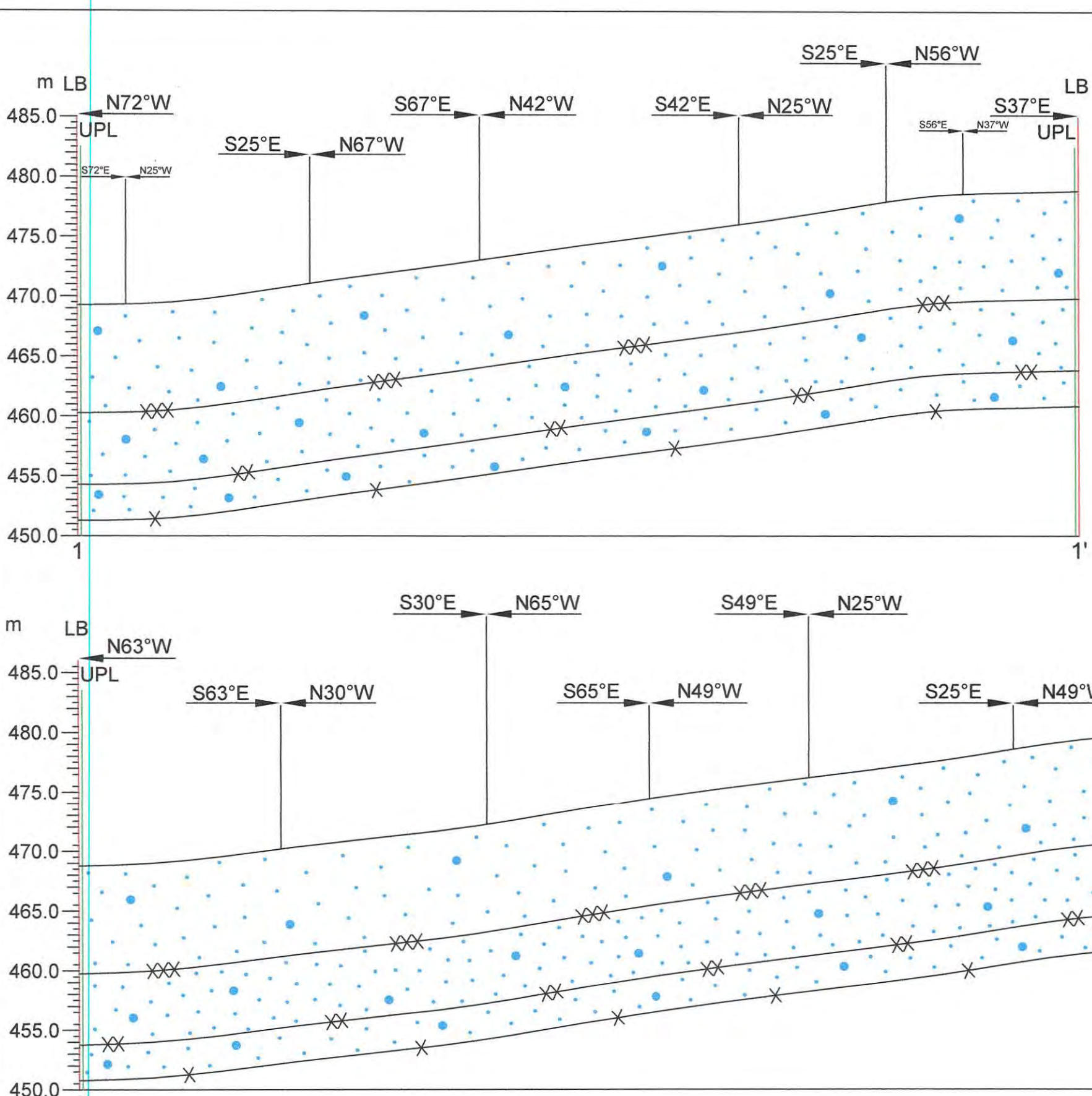
(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

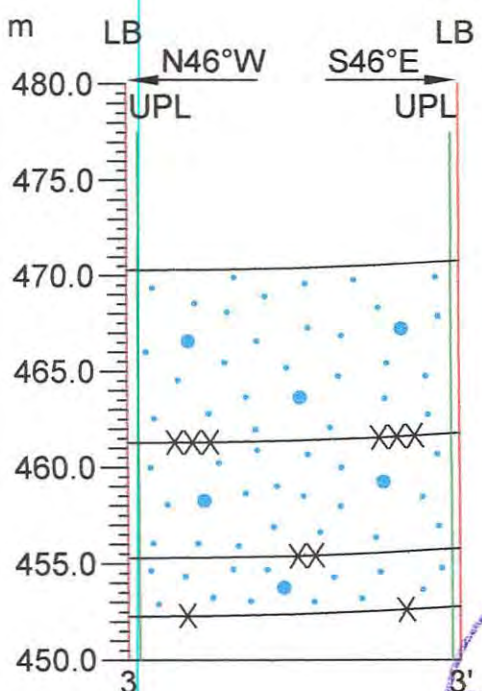
GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

SCALE 1:2000





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	RBM (DOON GRAVEL) *QUATERNARY*
LB	LEASE BOUNDARY
UPL	ULTIMATE PIT LIMIT
XXX	MEASURED MINERAL CONTACT
XX	INDICATED MINERAL CONTACT
X	INFERRED MINERAL CONTACT

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

PLATE - 3

GEOLOGICAL SECTIONS

(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

M/S GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

HORIZONTAL SCALE
1:2000

LANE NO. 8, INDRAPRASTHA, UPPER
NATHANPUR, RING ROAD,
DEHRADUN-248008 (UTTARAKHAND)

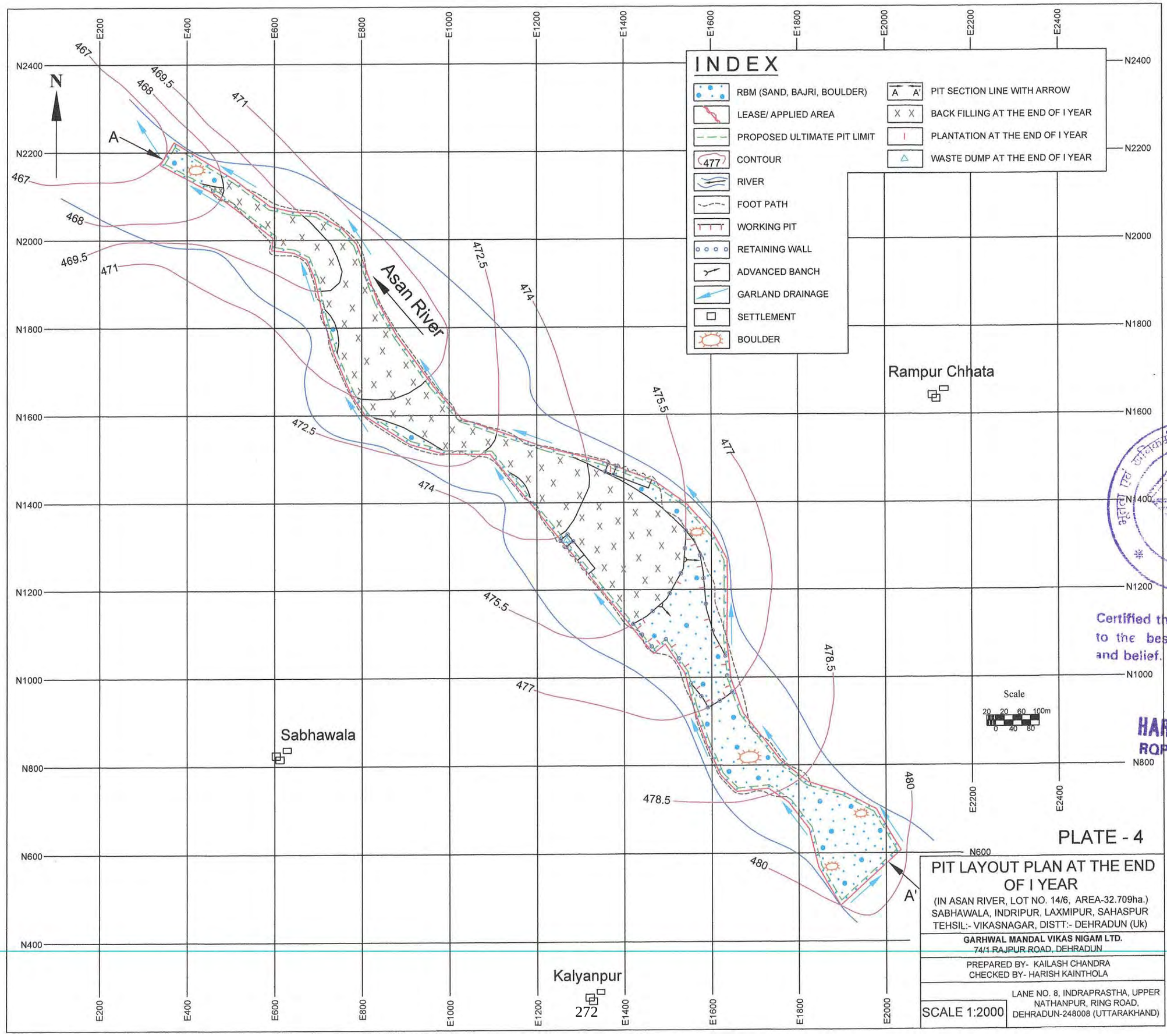


PLATE - 4

PIT LAYOUT PLAN AT THE END OF I YEAR

(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

SCALE 1:2000

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

भारतीय खनि ब्यूरो, इकाई, उत्तरांचल देहरादून

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

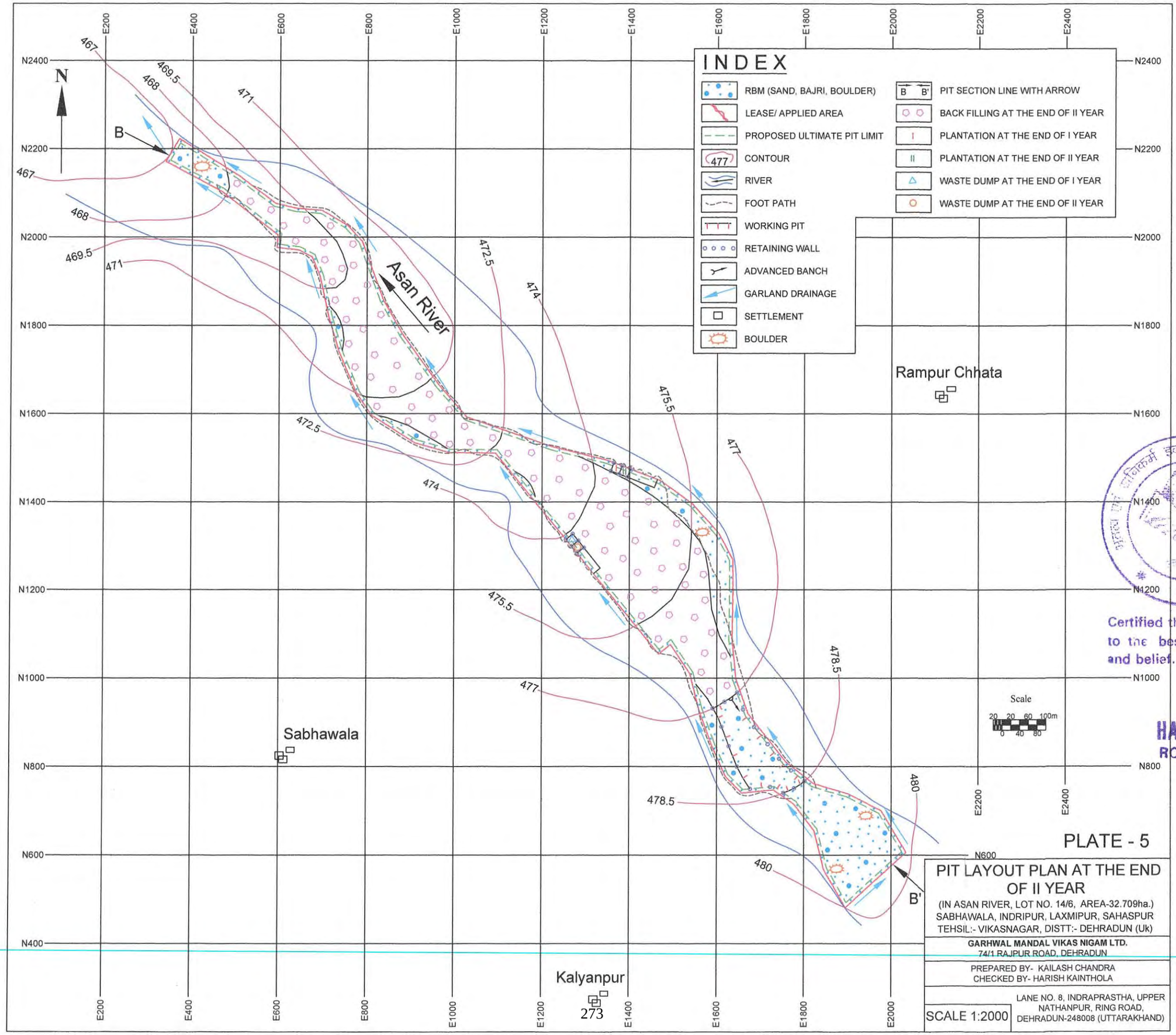


PLATE - 5

PIT LAYOUT PLAN AT THE END OF II YEAR

(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

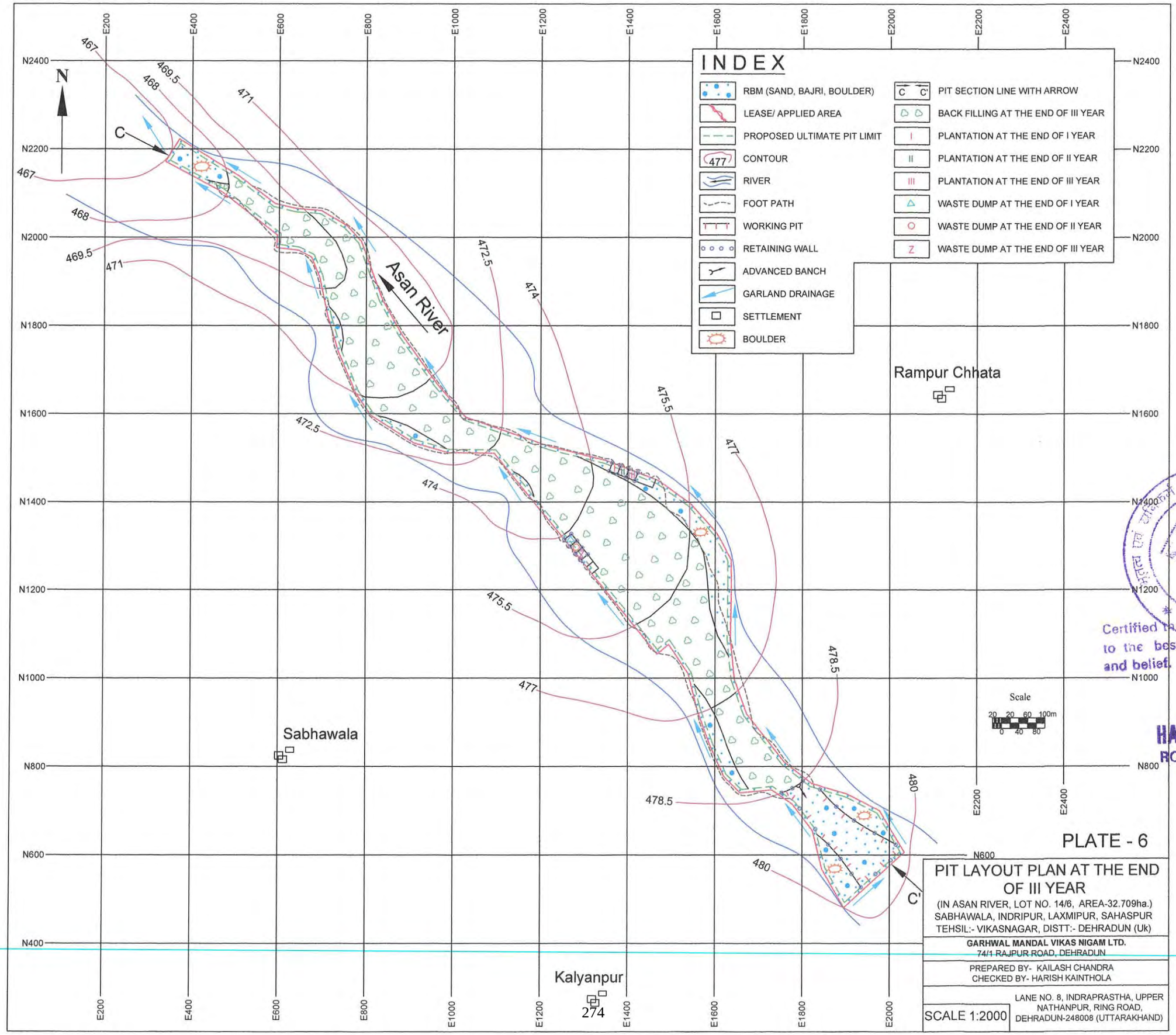
PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

SCALE 1:2000

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
ROP/DDN/141/2002-A



Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

PLATE - 6

PIT LAYOUT PLAN AT THE END OF III YEAR

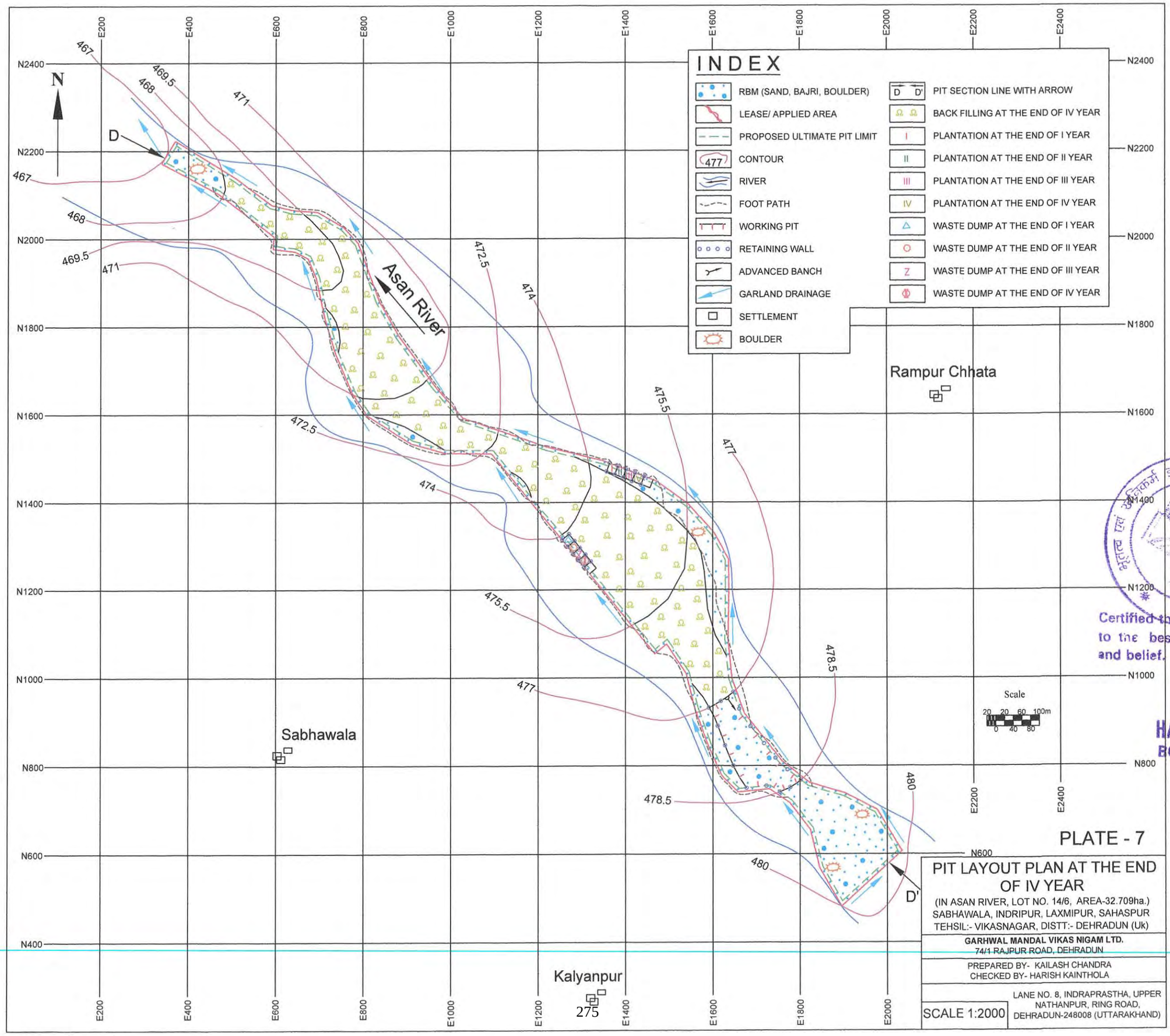
(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

SCALE 1:2000

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)



Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
BQP/DDN/141/2002-A

PLATE - 7

PIT LAYOUT PLAN AT THE END OF IV YEAR

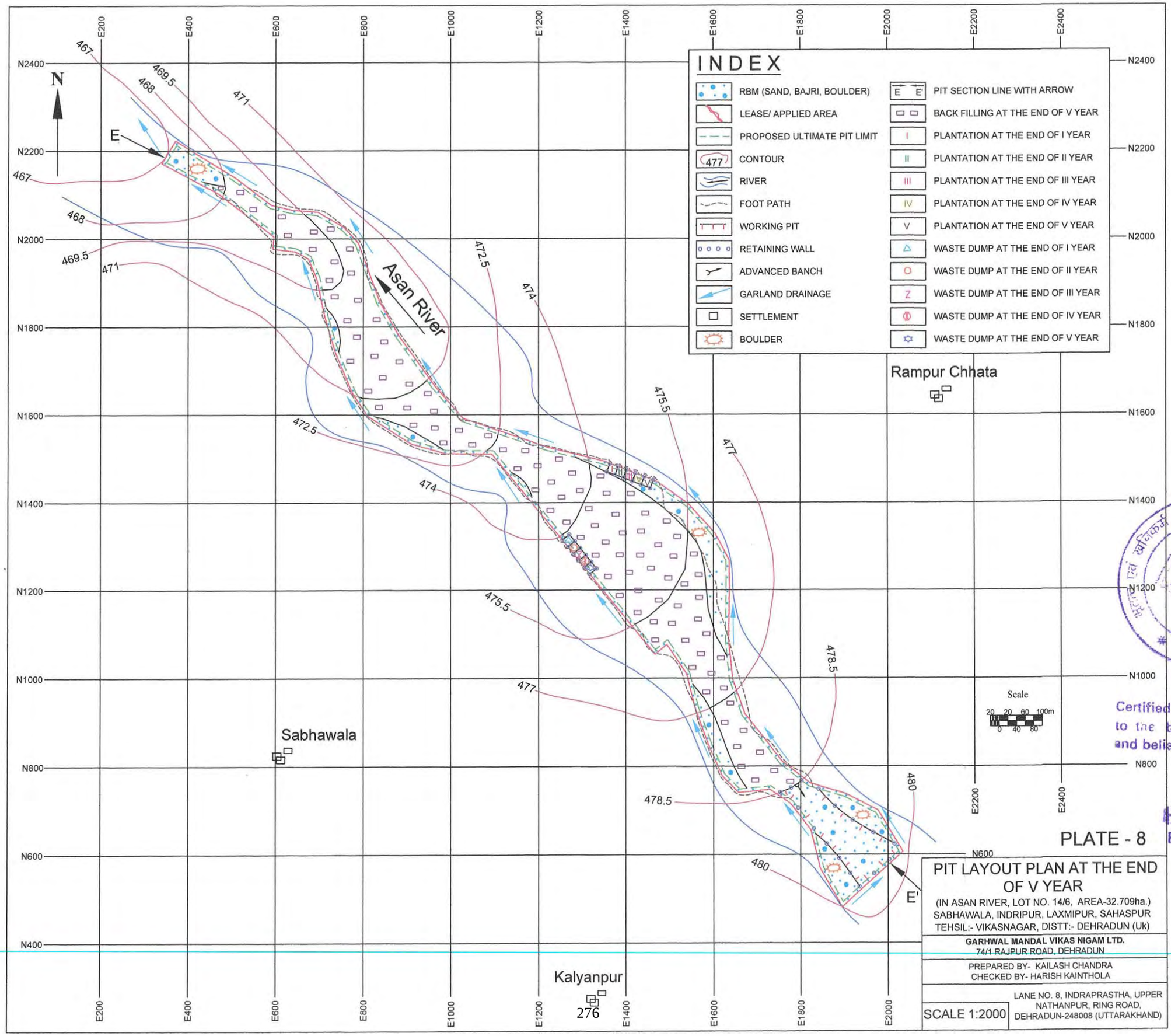
(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

SCALE 1:2000

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)



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- PIT SECTION LINE WITH ARROW
- BACK FILLING AT THE END OF V YEAR
- PLANTATION AT THE END OF I YEAR
- PLANTATION AT THE END OF II YEAR
- PLANTATION AT THE END OF III YEAR
- PLANTATION AT THE END OF IV YEAR
- PLANTATION AT THE END OF V YEAR
- WASTE DUMP AT THE END OF I YEAR
- WASTE DUMP AT THE END OF II YEAR
- WASTE DUMP AT THE END OF III YEAR
- WASTE DUMP AT THE END OF IV YEAR
- WASTE DUMP AT THE END OF V YEAR

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A

PLATE - 8

PIT LAYOUT PLAN AT THE END OF V YEAR

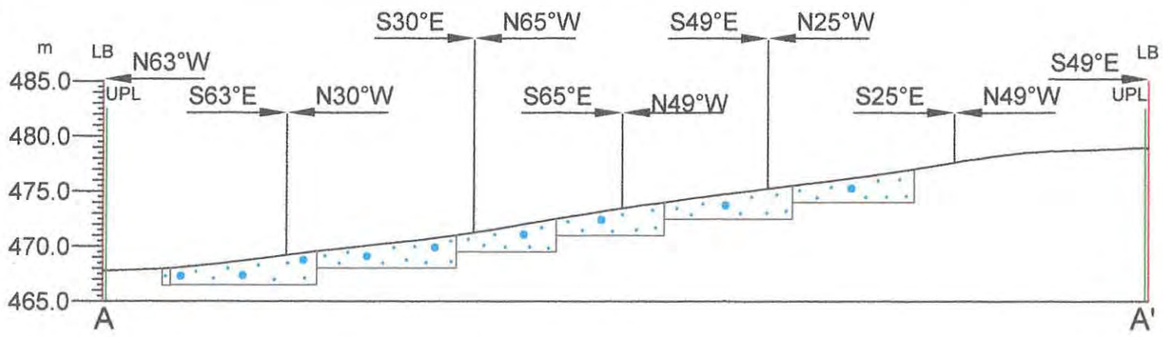
(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

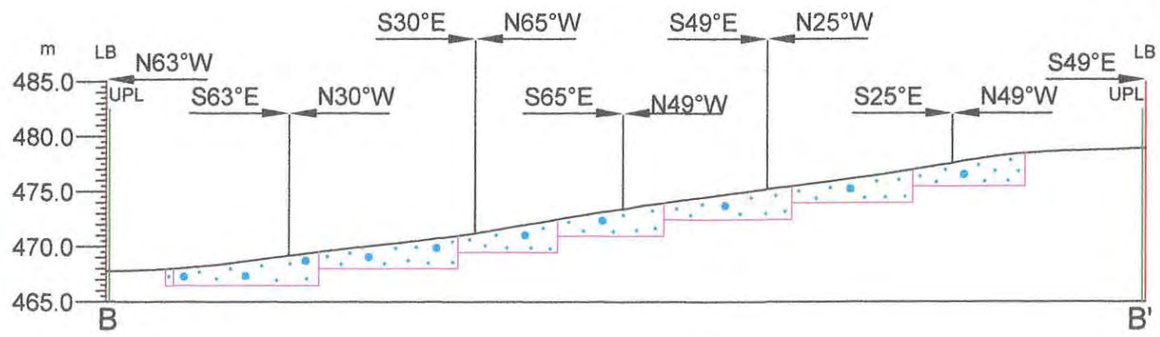
GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

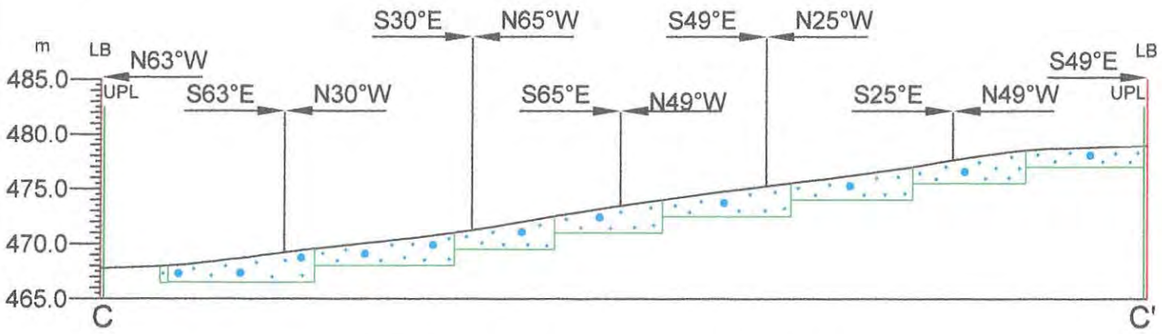
PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

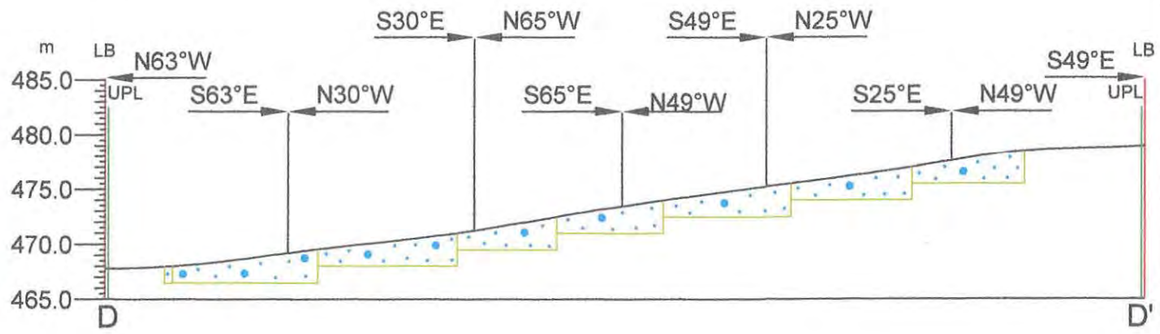
SCALE 1:2000

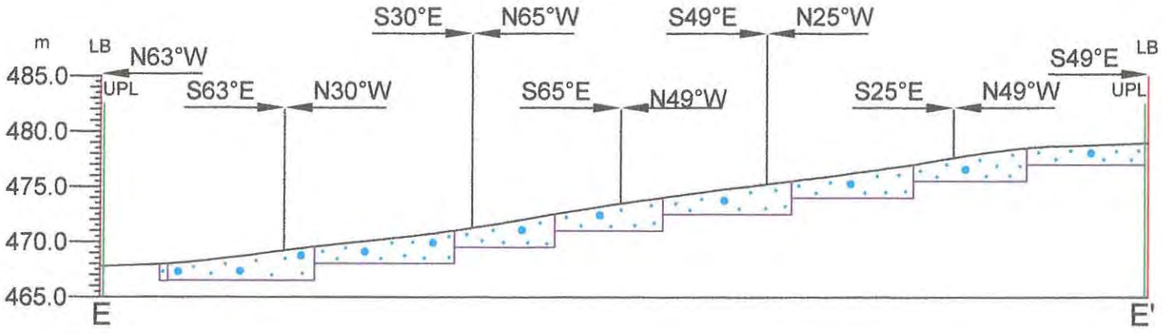
LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)











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UPL — ULTIMATE PIT LIMIT	

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- END OF II YEAR
- END OF III YEAR
- END OF IV YEAR
- END OF V YEAR

PIT SECTIONS

(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

M/S GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

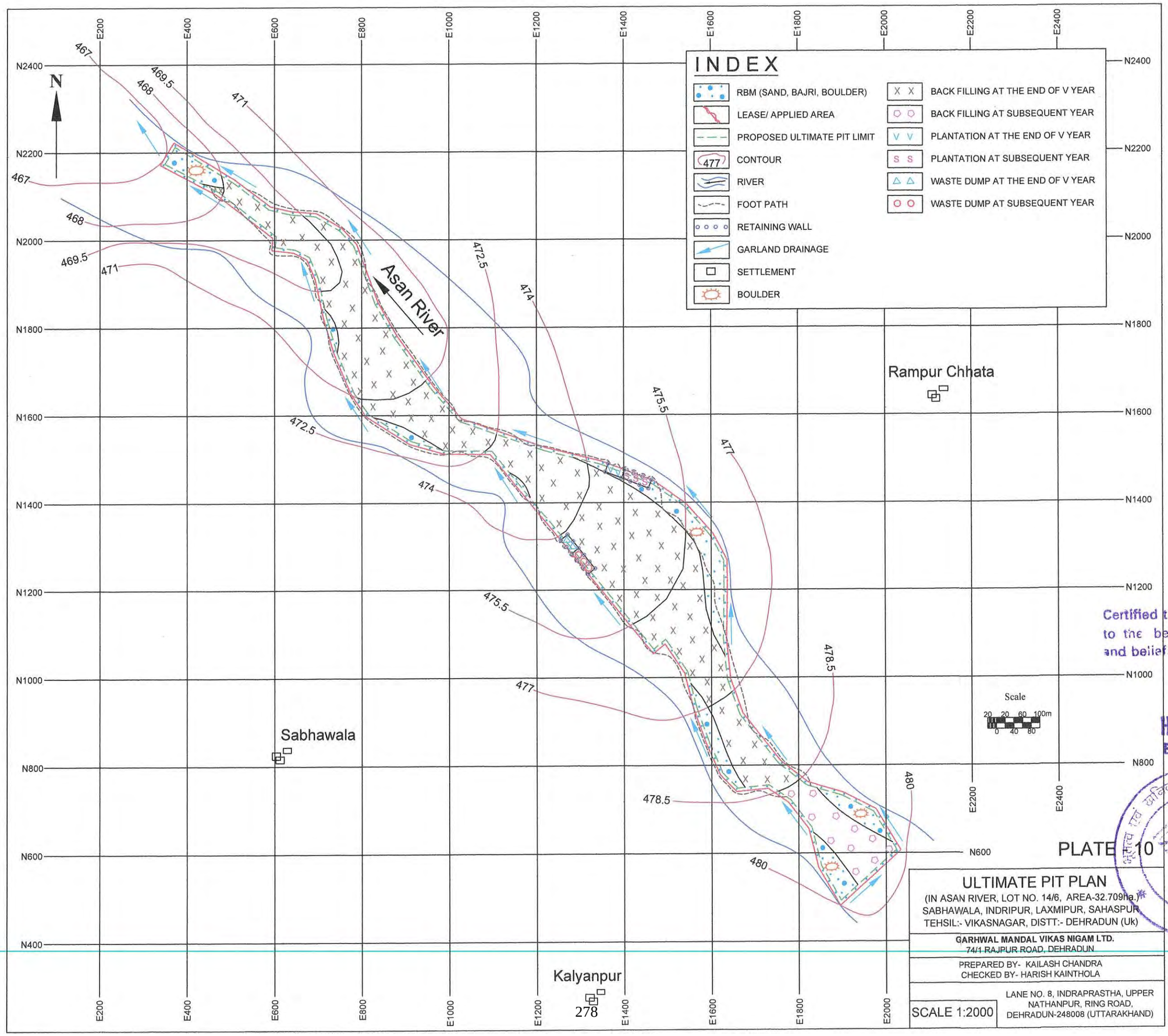
PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

LANE NO. 8 INDRAPRASTHA UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

HORIZONTAL SCALE 1:2000

Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
RQP/DDN/141/2002-A



Certified that the plan is correct to the best of my knowledge and belief.

HARISH KAINTHOLA
BQP/DDN/141/2002-A

PLATE - 10

ULTIMATE PIT PLAN

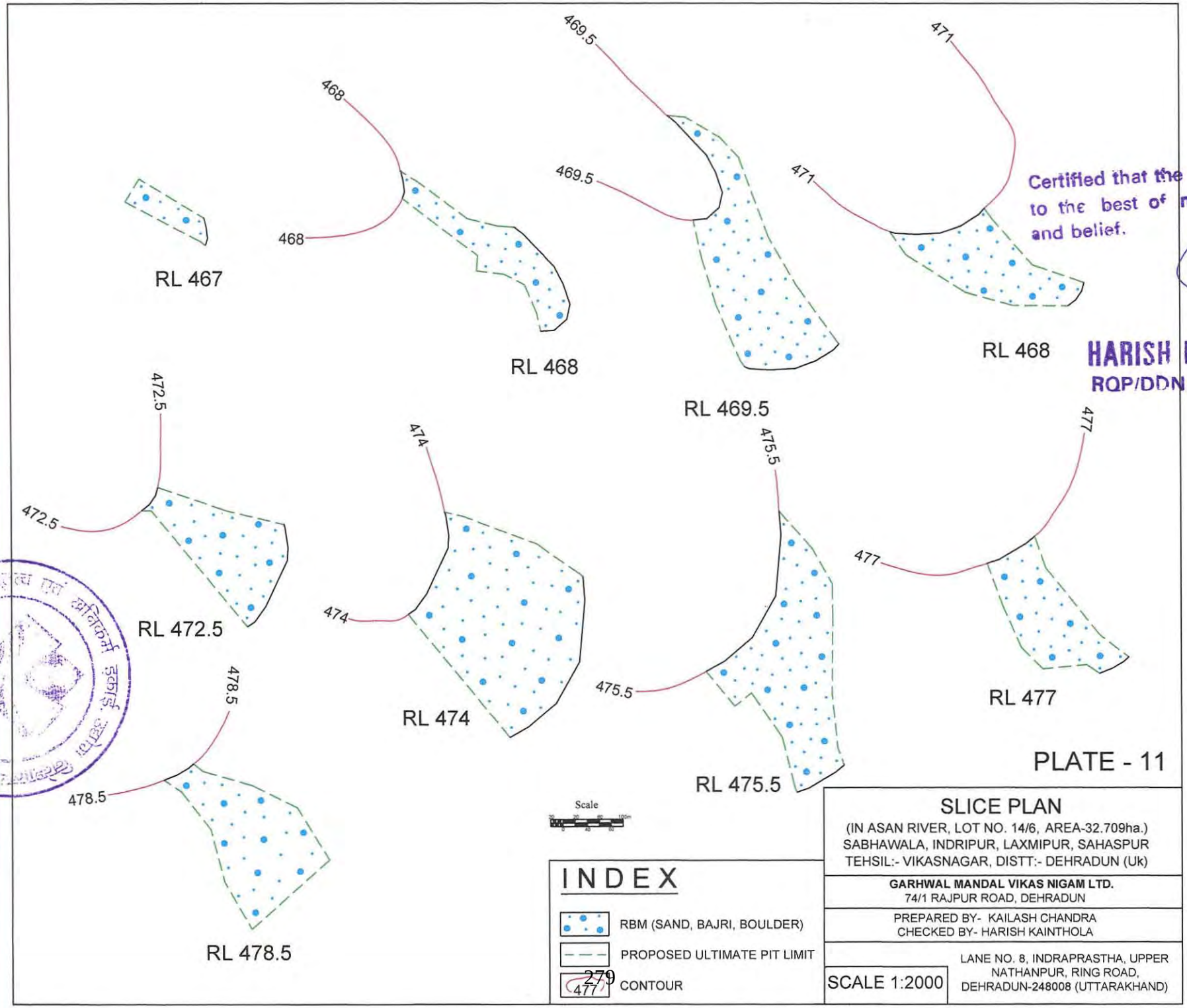
(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)

GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA

LANE NO. 8, INDRAPRASTHA, UPPER NATHANPUR, RING ROAD, DEHRADUN-248008 (UTTARAKHAND)

SCALE 1:2000


469.5
468
471
469.5
471
Certified that the plan is correct to the best of my knowledge and belief.
RL 467
468
RL 468
RL 469.5
RL 468
HARISH KAINTHOLA
RQP/DDN/141/2002-A
472.5
474
475.5
477
472.5
RL 472.5
474
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RL 475.5
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(IN ASAN RIVER, LOT NO. 14/6, AREA-32.709ha.)
SABHAWALA, INDRIPUR, LAXMIPUR, SAHASPUR
TEHSIL:- VIKASNAGAR, DISTT:- DEHRADUN (Uk)
GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN
PREPARED BY- KAILASH CHANDRA
CHECKED BY- HARISH KAINTHOLA
SCALE 1:2000
LANE NO. 8, INDRAPRASTHA, UPPER
NATHANPUR, RING ROAD,
DEHRADUN-248008 (UTTARAKHAND)

Geology and Mining unit, Directorate of Industries
Govt of Uttarakhand, Bhopalpani, Dehradun

Letter No. 13/Bhu. Khani/2015-16
Date 27-04-2015

To,

The Managing Director
Garhwal Mandal Vikas Nigam Ltd
74/1 Rajpur Road Dehradun.

Ref:- Letter No 36 /Khanan dated 18/04/2015 and Letter No 40/ Khanan dated 18/4/2015.

Sir,

In reference to the above mentioned letters and on the basis of the letter of RQP Shri Harish Kanthola dated 15/04/2015, it is stated that mining project and the mining characteristics in the 34 aproved mining plans of GMVN (list attached) is compatible with and similar in all aspects in the EIA Report both in draft and final EIA.

Your Faithfully

27/4/15
(S.L patrick)
Joint Director

Enclosure: As mentioned above.

1.	आसन नदी लॉट संख्या 14/5 ग्राम सहसपर	अन्तर्गत ख0नं0 240क, 410क	32.2180	संख्याः 2196/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
2.	टौंस नदी लॉट संख्या 14/9 ग्राम जस्सोवाला, लाखनवाला, मेदनीपुर बद्रीपुर	721/3, 722/1, 651/3, 483, 484	45.0	संख्याः 2208/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
3.	आसन नदी लॉट संख्या 14/1ए 14/1बी ग्राम सिंहनीवाला शीशमबाड़ा	खसरा संख्या 77मि0 खसरा संख्या 462मि0 खसरा संख्या 77मि	18.400	संख्याः 1344/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
4.	आसन नदी लॉट संख्या 14/2 कुल रकवा ग्राम सेरपुर सेन्ट्रल होप टाउन	खसरा संख्या 197मि0 खसरा संख्या 1353मि	21.094	संख्याः 1351/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
5.	आसन नदी लॉट संख्या 14/3 रकवा ग्राम हसनपुर, जमनपुर	ख0नं0 1122मि, 1मि मध्य	88.61	संख्याः 2219/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
6.	आसन नदी लॉट संख्या 14/4 रकवा ग्राम रामपुर, कल्याणपुर	ख0नं0 1175ग, 139, 140	35.405	संख्याः 2215/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
7.	आसन नदी लॉट संख्या 14/6 ग्राम सभावाला, इन्द्रीपुर, लक्ष्मीपुर एवं सहसपुर	खसरा नम्बर 2मि, 1मि, 585मि, 593, 594	32.709	संख्याः 2217/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
8.	टौंस नदी लॉट संख्या 14/8 रकवा ग्राम खुशालपुर अन्तर्गत	खसरा नम्बर 819ज	32.0	संख्याः 2216/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
9.	आसन नदी लॉट संख्या 14/10 ग्राम फतेहपुर, धर्मावाला, प्रतीतपुर	ख0नं0 1409, 2मि, 1मि, 2मि, 583	62.00	संख्याः 2212/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
10.	बांण गंगा, बालावाली, जनपद हरिद्वार	591क	31.570	संख्याः 2209/मा0प्लान/उ0खनि0/हरिद्वार/2013–14 दिनांक 03 मार्च, 2015
11.	जाखन नदी रानीपोखरी ग्रांट लॉट संख्या 13/1	खसरा संख्या 923क	18.00	संख्याः 1349/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
12.	जाखन नदी माजरी ग्रांट लॉट संख्या 13/2 (अब 13/2ए एवं 13/2बी) है0		92.652	संख्याः 1348/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
13.	ग्राम गुजराड़ा करनपुर, गुजराड़ा, फुलसडी, विलासपुर कांडली लॉट नं0 8/4 नून नदी	खसरा नं0–476 खसरा नं0–278 खसरा नं0–418 खसरा नं0–400 खसरा नं0–1	21.6680	संख्याः 1345/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
14.	ग्राम हरनोल व धंधोरा के मध्य स्थित नून नदी केलॉट नं0 8/3	खसरा सं0 136	10.360	संख्याः 1346/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
15.	ग्राम गल्जवाड़ी व	ख0नं0 78 (आंशिक)	7.500	संख्याः 2198/मा0प्लान/

	सलियावाला तहसील देहरादून एवं विकासनगर नून नदी लॉट संख्या 8/1			उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
16.	ग्राम धोलास तहसील देहरादून एवं विकासनगर जनपद देहरादून क्षेत्रान्तर्गत नून नदी लॉट संख्या 8/2	ख0नं0 1084 (आंशिक), ख0नं0 1(आंशिक)	7.60	संख्याः 2203/मा0प्लान/ उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
17.	ग्राम सलेमपुर मेहदूद तहसील एवं जनपद हरिद्वार के राऊ नदी	खसरा नं0 431	7.702	संख्याः 2197/मा0प्लान/ उ0खनि0/हरिद्वार/2013–14 दिनांक 03 मार्च, 2015
18.	ग्राम सुमननगर तहसील एवं जनपद हरिद्वार राऊ नदी	खसरा संख्या 2, 639	10.350	संख्याः 2204/मा0प्लान/ उ0खनि0/हरिद्वार/2013–14 दिनांक 03 मार्च, 2015
19.	ग्राम गढ रोसनाबाद तहसील एवं जनपद हरिद्वार के राऊ नदी	खसरा नं0 684	11.883	संख्याः 2213/मा0प्लान/ उ0खनि0/हरिद्वार/2013–14 दिनांक 03 मार्च, 2015
20.	गंगा नदी मिस्सरपुर	खसरा नं0 1,2,3,7 से 9, 11 से 19, 23 से 36, हादीपुर 1, 2, व 3	74.208	संख्याः 1342/मा0प्लान/ उ0खनि0/हरिद्वार/2013–14 दिनांक 02 जनवरी, 2015
21.	ग्राम डोईवाला, मिसरवाला खुर्द, घिरपढी, डेसवाला, फतेहपुर टाण्डा, मारखमग्रान्ट तहसील ऋषिकेश एवं देहरादून जनपद देहरादून सौंग नदी लॉट संख्या 7/2	ख0नं0 264, 242, 243, 455, 226, 228, 229, 215/1, 226/1, 227/1, 242, 243/2, 245, 247, 248/2, 368, 1794, 1795, 1796, 1797, 1798	135.856	संख्याः 2211/मा0प्लान/ उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
22.	ग्राम रांगड़वाल, शाहपुर सन्तौर, कोटड़ा सन्तौर तहसील विकास नगर जनपद देहरादून टॉस नदी लॉट संख्या 3/8	ख0नं0 2, 1, 388, 389	15.363	संख्याः 2207/मा0प्लान/ उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
23.	राजस्व ग्राम कौलागढ, प्रेमपुर माफी, बिलासपुर कांडली तथा बाजावाल तहसील एवं जनपद देहरादून क्षेत्रान्तर्गत टौंस नदी लॉट संख्या 3/6	खसरा नं0–1 (कौलागढ) खसरा नं0–1 (प्रेमपुर माफी) खसरा नं0 361 (विलासपुर कांडली) खसरा नं0–1 (बाजावाला)	10.523	संख्याः 2205/मा0प्लान/ उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
24.	ग्राम आरकेडिया ग्रान्ट अन्तर्गत टौंस नदी लॉट संख्या 3/11	ख0नं0 1, 30, 31मि	11.100	संख्याः 1342/मा0प्लान/ उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
25.	ग्राम झाझरा, ईस्ट होप टाऊन तहसील	ख0नं0 1166मि, ख0नं0 1166मि0,	46.931	संख्याः 2210/मा0प्लान/ उ0खनि0/देहरादून/2013–14

	विकासनगर, जनपद देहरादून क्षेत्रान्तर्गत टौंस नदी लॉट संख्या 3/12	1156मि, 1156मि, 1161मि, 1162मि, 1163मि, 1164मि		दिनांक 03 मार्च, 2015
26.	ग्राम बंशीवाला, तहसील विकासनगर, जनपद देहरादून क्षेत्रान्तर्गत टौंस नदी लॉट संख्या 3/13	239मि	6.0	संख्याः 2206/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
27.	ग्राम मेहरका गांव व शीशमबाड़ तहसील विकास नगर जनपद देहरादून क्षेत्रान्तर्गत टौंस नदी लॉट संख्या 3/14	ख0नं0 688, 466 मध्ये	6.700	संख्याः 2202/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
28.	ग्राम सुद्धोवाला ईस्ट होप टाऊन अन्तर्गत टौंस नदी लॉट संख्या 3/10	ख0नं0 716, 1	23.00	संख्याः 1350/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
29.	ग्राम डाकपत्थर, नवाबगढ, मण्डीगंगभेवा व भीमावाला, तहसील विकासनगर जनपद देहरादून क्षेत्रान्तर्गत यमुना नदी लॉट संख्या 21/1	खसरां नम्बर 396मि, 386मि, 389मि, 1मि, 3मि मध्य	123.1900	संख्याः 2200/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
30.	ग्राम ढकरानी, तहसील विकासनगर, जनपद देहरादून क्षेत्रान्तर्गत यमुना नदी लॉट संख्या 21/2	खसरा नम्बर 971, 969, 970, 936मि मध्य	34.940	संख्याः 2201/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
31.	ग्राम कुल्हाल क्षेत्रान्तर्गत यमुना नदी लॉट संख्या 23/3	खसरा नम्बर 1क मध्ये	14.970	संख्याः 1347/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 02 जनवरी, 2015
32.	ग्राम ढकरानी, मण्डी गंगभेवा, तहसील विकासनगर जनपद देहरादून क्षेत्रान्तर्गत यमुना नदी लॉट संख्या 21/3	खसरा नम्बर 1(आंशिक), 2क, 618,1 मध्य	68.364	संख्याः 2218/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
33.	ग्राम डूमेट, तहसील विकासनगर जनपद देहरादून क्षेत्रान्तर्गत यमुना नदी लॉट संख्या 23/1	खसरा नम्बर 649क मध्य	30.035	संख्याः 2214/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015
34.	ग्राम डुमेट, तहसील विकास नगर जनपद देहरादून क्षेत्रान्तर्गत अन्तर्गत यमुना नदी लॉट संख्या 23/2	ख0नं0 1घ, 2क मध्य	31.203	संख्याः 2199/मा0प्लान/उ0खनि0/देहरादून/2013–14 दिनांक 03 मार्च, 2015

GMVN
GARHWAL MANDAL VIKAS NIGAM LTD.
74/1 RAJPUR ROAD, DEHRADUN

E-Mail: gmvnl@gmvnl.com
gmvn@sancharnet.in
Ph :- 0135-2746817,2749308
Fax :- 2746847

Ref.....420/1977 **Date:** 11.9.2014

To,

DIVISIONAL **Forest Officer,** (KALSI)
District Dehradun,
Uttarakhand

Sub.: Issue of Non Objection Certificate for the proposed sites- River Aasan Lot no. 14/5, 14/6, 14/8, 14/9 and 14/10 at District: Dehradun, State: Uttarakhand by Garhwal Mandal Vikas Nigam for river bed mining in the allotted area.

Dear Sir,

This is for your kind information that the above mentioned projects for mining of Boulder, Bajri and Sand lies in district Dehradun, Uttarakhand comprising of Aasan Conservation Reserve within 10km of the study area.

Kindly provide a NOC mentioning that there is no objection to carry out mining operations in the proposed sites.

Thanking you.

प्राप्त किया
19/11/14

Yours truly,

Managing Director

Plant Species for Greenbelt Development/ Plantation

Mine lease area of the proposed project is located in the dry river bed near the shore of the Asan River. Hence, the plantation will be done along the road/ any Govt. School/ College campus and Panchayat area of any nearest village.Plant species for plantation/ Greenbelt developmentwill be selected from following list:

Sl. No.	Botanical name	Common Name	Uses
1	*Aegle Marmelos*	Bael	Fruit edible, Medicinal
2	*Altingia excelsa*	Singri	Medicinal, Timber
3	*Anthocephalus cadamba*	Kadam	Fruit edible, Medicinal
4	*Azadirachta indica*	Neem	Timber; Medicinal
5	*Castanopsis indica*	Hingori	Nuts edible; Timber, Medicinal
6	*Dalbergia sissoo*	Sisham	Timber, fuel
7	*Emblica officinalis*	Amla	Flower bud edible
8	*Eugenia jambolana*	Jamun	Medicinal
9	*Ficus racemosa*	Pakari	Flower bud edible,
10	*Ficus religiosa*	Pipal	Flower bud edible, Medicinal
11	*Mangifera indica*	Mango	Timber, Fruit edible
12	*Michelia champaca*	Champaka	Timber, Medicinal
13	*Shorea robusta*	Sal	Timber, Medicinal,
14	*Tamarindus indica*	Emli	Timber, Fruit edible
15	*Terminalia chebula*	Myrobalan	Fruit edible, Medicinal
16	*Ziziphus mauritiana*	Ber	Timber, Fruit edible

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Ref.....744/ २९७७

Date 9/12/14

To,

PCCF & Chief Wildlife Warden,
Govt. of Uttrakhand,
Wildlife Insitute 5,
Chandrabhani Mohadewla,
Dehradun-248001

Sub: Authentication of Conservation Plan for Mining Projects of Garhwal Mandal Vikas Nigam Ltd.

Dear Sir,

As per the Terms of Reference (ToR) awarded by the MoEF, EIA/EMP reports has been prepared as per the EIA Notification, 2006.

I am here by submitting the conservation plan for Schedule-I & II species as desired by ministry for granting Environmental Clearance of GMVN Ltd. Mining projects.

Hope you will be find this in order. I kindly request you to process expeditiously our application.

Thanking you.

Yours truly,

Managing Director

प्रेषण विवरण
मुख्य वन्य जीव प्रतिपालक (व०जी०)/
मुख्य वन्य जीव प्रतिपालक उत्तराखण्ड
18/12/14

Encl: *As Above*

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Ph :- 0135-2746817,2749308
Fax :- 2746847

Ref...../

Date:

STRUCTURE OF THE COMMITTEE FOR TRAFFIC

AND REPLENISHMENT STUDIES.

1. **Chairman**:

Managing Director, GMVN

2. **Members**:

a) Inhouse Members:

- General Manager (Tourism, GMVN)
- General Manager (Mining, GMVN)
    - District Coordinator (GMVN) for micro level management

b) Member Invitees:

- Member invitee from Forest Department
- Member invitee from Mining Department
    - Any other specialist can be invited according to the need.

3. **Expert Agency**:

Expert Agency for sedimentation & traffic study will be selected as per the State Procurement Rule, Uttarakhand.

The committee will facilitate GMVN Ltd. to monitor the traffic and replenishment studies.

Managing Director
GMVN Ltd.