DRAFT EIA

FOR

SAND MINING PROJECT

AT

Arwal Sone - 05 on Son River

Mauza- Makhdumpur, P.S- Arwal, Block- Arwal , District- Arwal, Bihar

AREA: 8.98 Hectare or 22.19 Acre,

CAPACITY: 161640 cum or 290952 TPA

APPLICANT
Radharaman Construction & Marketing Pvt. Ltd.
3rd Floor, Plot No.- 388/389, Biscuit Factory More,
Nasriganj, PO- Danapur, P.S-Danapur, Patna

PREPARED BY

ENVIRONMENT CONSULTANT

Rian Enviro Private Limited
QCI – NABET Certificate No: NABET/EIA/2124/IA 0079
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The study area is dominated by General caste and other backward community; Agriculture is the predominant occupation however currently there is a wave of change of occupation. There by other worker are increasing in the study area. The immediate surroundings of the projects lack the amenities. The villagers are very optimist by the proposed opening of proposed sand mining at

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1 INTRODUCTION

1.1 PREAMBLE

The term Environment Impact Assessment (EIA) refers to the anticipation of various impacts a project will have on the environment and the local community. It is a decision-making tool, which guides decision makers in taking appropriate decisions prior to sanctioning clearance. Environmental Impact Assessment (EIA) is a tool used to identify the environmental, social and economic impacts of a project prior to decision-making. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.

1.2 GENERAL INFORMATION

The proposed sand mining project at Arwal Sone Ghat-5 on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar). The District Mining Office, Arwal, through vide letter No 1150/Kh, dated 26.10.2022 has granted the LOI in favor **Radharaman Construction & Marketing Pvt. Ltd, Director. – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S-Danapur, Patna** for the period of 5 years from the date of execution. A copy of LOI is attached as **Annexure-I.**

Mine plan and Progressive Mine Closure Plan: Mining Plan and Progressive Mine Closure Plan of the proposed mine lease area is prepared by **United Exploration India Pvt. Ltd** having QCI NABET accreditation No. NABET/APA-MPPA/IA/006, with validity up to 11th March, 2024.

The mining plan for the Arwal Sone Ghat-5 has been approved from the Department of Mines & Geology, Govt. of Bihar through vide letter No. 6004/M Patna dated 07/12/2022 Copy of approval Letter of Mining Plan and Progressive Mine Closure Plan has attached as **Annexure II.**

Environment Consultant: The lessee has hired an Environment Consultant Rian Enviro Private Limited, H/O- 202 & 402, Mangal Market, Sheikhpura, Raja Bazar, Patna, Pincode- 800014 for

preparation of Environment Impact Assessment Report for obtaining Environment Clearance from SEIAA, Bihar.

ToR Letter: It is in this context, hard copy of Form-I and Pre-Feasibility Report has been submitted to SEIAA/SEAC, Bihar on 21.12.2022 requesting for issue of "Terms of Reference" (ToR). The technical presentation for ToR before SEAC, Bihar was held on 26.12.2022. Subsequently, the ToR Letter has been issued on date 11.01.2023 by SEIAA, (File no-SIA/1(a)/2087/2022).

1.3 IDENTIFICATION OF PROJECT AND PROJECT PROPONENT

1.4 Identification of Project

Mining of Minor mineral (Sand) from the river Sone by Rajeev Ranjan Singh having an area of 8.98ha with production capacity of 161640 Cum/Year or 290952 TPA. The mine is situated in the Mauza- Makhdumpur, Block– Arwal, District- Arwal (Bihar). The mine lease area falls in the survey of India Toposheet no G45M7, G45M8, G45M11, G45M12.

1.5 Identification of Project Proponent

The applicant details are given below: -

Sl No.	Name of the Mine lease area	Applicant
1	**Arwal Sone Ghat-5** on River Sone Area 8.98 hectare	Radharaman Construction & Marketing Pvt. Ltd Director. – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S-Danapur, Patna

ENVIRONMENTAL CLEARANCE

The Proposed Sand Mining Project at Khata no. – 104 Khasra No.- 617 of Arwal Sone Ghat-5 on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur, Block– Arwal, District- Arwal (Bihar) falls in Category "B1", 1(a), due to Mining lease area is more than 5.0 Ha as per honorable NGT order and as per OM dated 12.12.2018. Project will be assessed by SEIAA, Bihar. Lessee will have to take Environmental Clearance from SEIAA, Bihar as per EIA notification September,

2006 amended in December 2009 and April 2011and amendment thereof to start the mining operation.

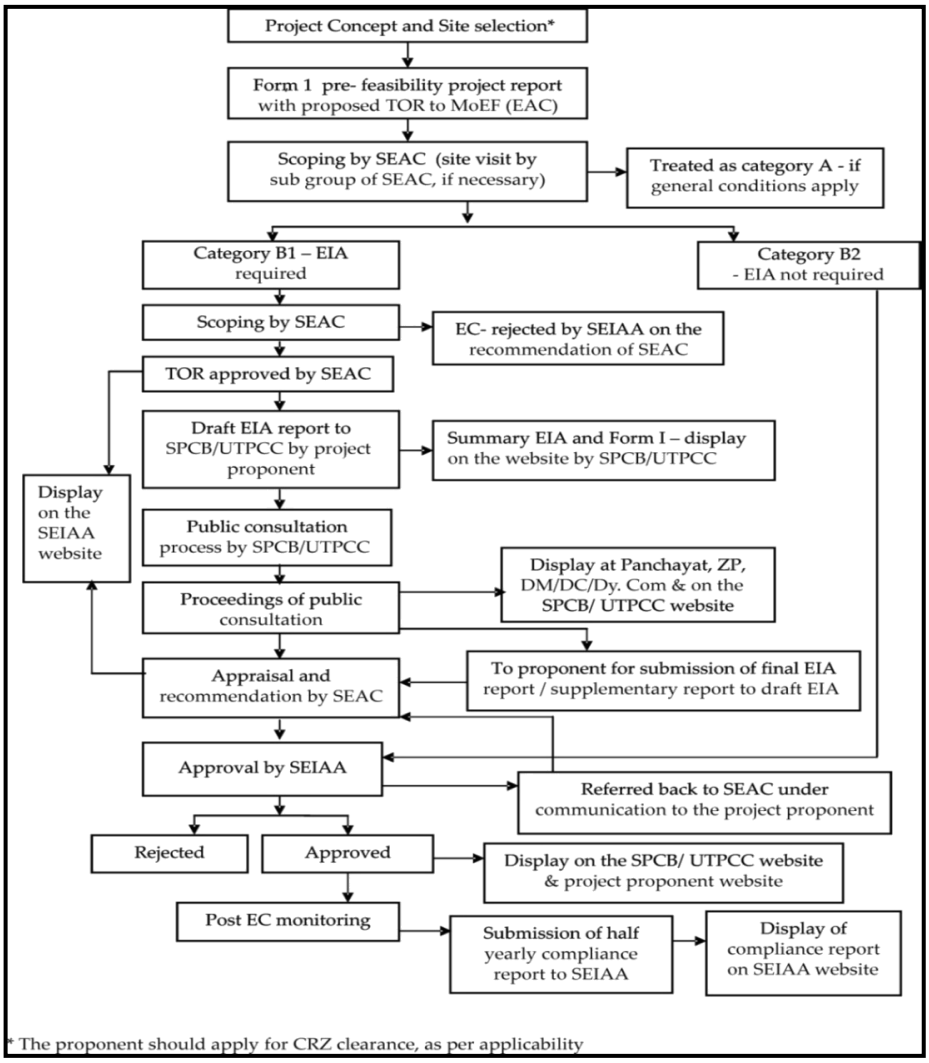


Figure 1-1 Environmental Clearance Process

1.6 BRIEF DESCRIPTION OF NATURE, SIZE, LOCATION OF THE PROJECT

S. No.	Particulars	Details
1.	**Nature and Size of the Project**	Mining of Sand Minor Minerals with Production Capacity of 161640 cum per annum or 290952 Tonnes/Year (M.L. Area- 8.98 ha).
2.	**Location**	
	Plot/Survey/Khasra No.	

River Name	Khata no	Khasra no	Name of the Ghat	Area (Ha.)
Sone	104	617	Arwal Sone Ghat-5	8.98

<table>
<tr><td></td><td>Village</td><td>Mauza- Makhdumpur,</td></tr>
<tr><td></td><td>Block</td><td>Block- Arwal</td></tr>
<tr><td></td><td>District</td><td>Arwal</td></tr>
<tr><td></td><td>State</td><td>Bihar</td></tr>
<tr><td>Geographical Coordinates</td><td>Latitude and Longitude of</td><td>Arwal Sone Ghat-5: -
<table>
<tr><th colspan="3">Coordinates of the Lease Boundary</th></tr>
<tr><th>Sl no.</th><th>Latitudes</th><th>Longitudes</th></tr>
<tr><td>1</td><td>25.248625</td><td>84.649784</td></tr>
<tr><td>2</td><td>25.24782</td><td>84.652276</td></tr>
<tr><td>3</td><td>25.247705</td><td>84.65339</td></tr>
<tr><td>4</td><td>25.248408</td><td>84.655128</td></tr>
<tr><td>5</td><td>25.250165</td><td>84.657477</td></tr>
<tr><td>6</td><td>25.25034</td><td>84.657795</td></tr>
<tr><td>7</td><td>25.250082</td><td>84.657799</td></tr>
<tr><td>8</td><td>25.24821</td><td>84.655628</td></tr>
<tr><td>9</td><td>25.247305</td><td>84.654468</td></tr>
<tr><td>10</td><td>25.245901</td><td>84.651838</td></tr>
<tr><td>11</td><td>25.248226</td><td>84.649405</td></tr>
<tr><td>12</td><td>25.248625</td><td>84.649784</td></tr>
</table></td></tr>
<tr><td></td><td>Toposheet (OSM) No.</td><td>G45M7, G45M8, G45M11, G45M12</td></tr>
<tr><td>3.</td><td colspan="2">Lease Area Details</td></tr>
<tr><td></td><td>Lease Area</td><td>8.98.0 Ha.</td></tr>
<tr><td></td><td>Type of Land</td><td>River bed of Sone</td></tr>
<tr><td></td><td>Topography</td><td>Undulated (Riverbed)</td></tr>
<tr><td></td><td>Site Elevation Range</td><td>71.85 m to 71.25 m</td></tr>
<tr><td>4.</td><td>Cost Details</td><td></td></tr>
<tr><td></td><td>Cost of the project</td><td>Rs. 325.19 Lakhs (Including Auction Cost)</td></tr>
<tr><td></td><td>Cost for EMP</td><td>3.9 Lakh (Capital Cost) & 7.94 Lakhs (Recurring Cost)</td></tr>
<tr><td>5.</td><td colspan="2">Environmental Settings of the area</td></tr>
</table>

	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no any Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius.
	Nearest Town/ Major City with population	Nearest Town & District Headquarter: Arwal, approx. 1.0 km towards SE
	Nearest Railway Station	Nagrigram Halt Railway Station, approx. 22.5 Km towards NW
	Nearest National/State Highway	NH 139-Approx. 0.84 Km towards East
	Nearest Airport	Patna Airport, approx. 58 Km towards NE.
	Nearest Post Office	Head Post office Arwal, approx. 1.2 Km towards ESE direction.
	Medical Facilities	PHC, Arwal, Approx. 1.0 Km towards East.
	Education Facilities	GA High School, Arwal, Approx. 1.0 Km towards East.
	Seismic Zone	Zone III (IS 1893: 2002)
	Water Body	Sone River (Riverbed)

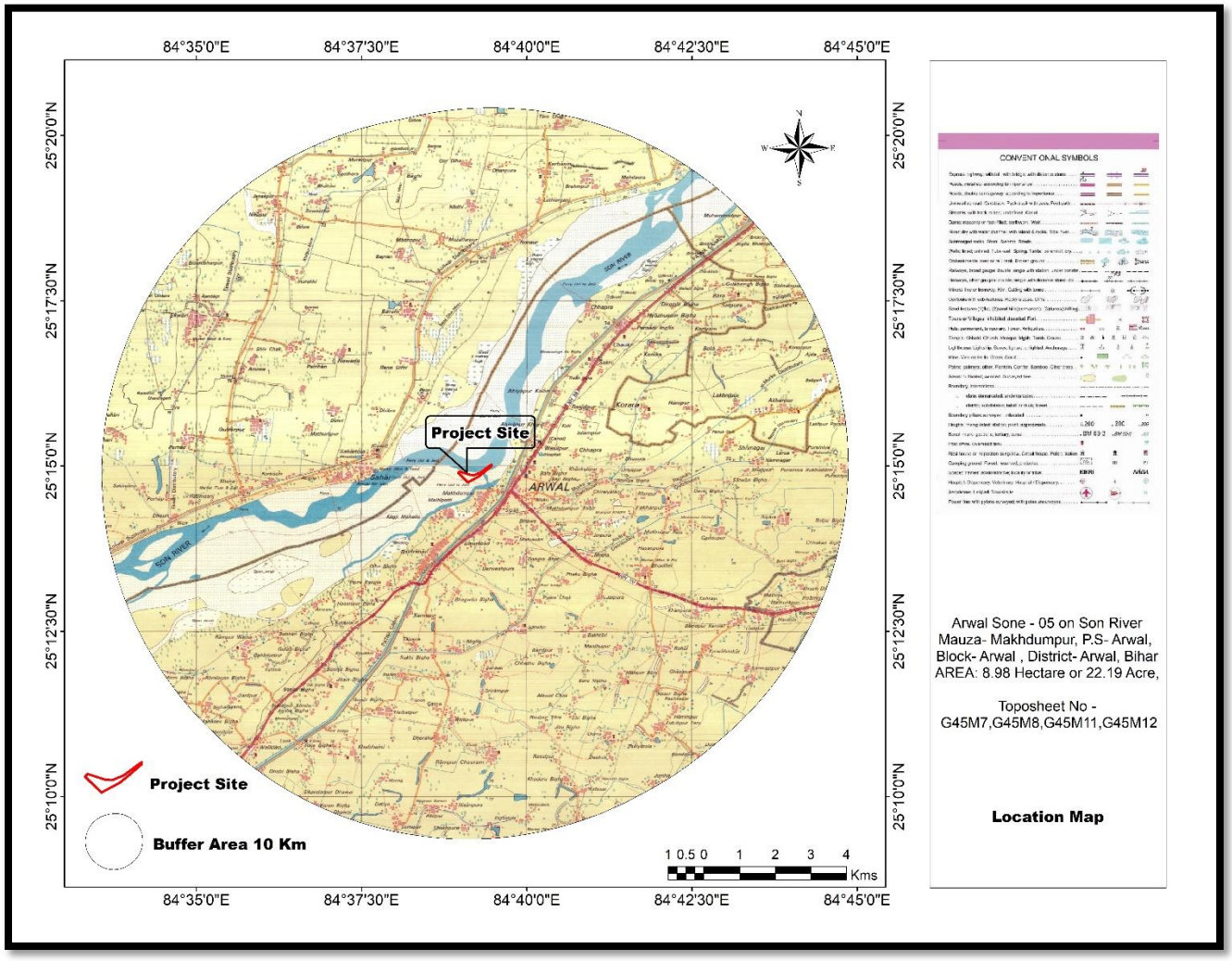


Figure 1-2 Toposheet map

1.7 SCOPE OF STUDY

The scope of the study includes a detailed characterization of the environment in an area of 10 Km radius of the Mine Lease Area for various environmental parameters like Ambient Air, Water, Noise, and Land, Biological and Socio-economic aspects.

1.8 Preparation of EIA

The EIA includes the following details:

1) Study of the reports like Geological report, Pre-Feasibility Report (PFR) or mining plan made available by the client.
2) Present Environmental Setting
3) Identification, prediction and evaluation of Anticipated Environmental Impact due to the proposed mine and related facilities.

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

- Topography and drainage,
- Climate,
- Water quality (Surface/Ground),
- Hydro-geological Regime,
- Air quality,
- Noise Levels,
- Soil Quality,
- Flora and Fauna,
- Traffic density survey,
- Land-Use,
- Socio-Economic Conditions,
- Habitat,
- Health, culture, human environment including public health, occupational health and safety
- Sensitive Places/Historical Monuments.

This EIA Report is prepared in accordance with has been divided into twelve chapters (in addition to Executive Summary) as briefed hereunder:

Chapter 1 – Introduction

The chapter provides description of project background, site and surroundings, objectives, scope and organization of the study and format of this report as well as Point wise Term of Reference reply (TOR) Replies.

Chapter 2 – Project Description

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

Chapter 3– Description of the Environment

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

Chapter 4 – Anticipated Environmental Impacts and Mitigation Measures

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

Chapter 5 – Analysis of Alternatives (Technology and Site)

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

Chapter 6 – Environmental Monitoring Program

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

Chapter 7 – Additional Studies

This chapter will include outcomes of public consultation, risk assessment, social impact assessment, R&R action plan, biodiversity conservation plan, watershed management etc which will be studied in surrounding of the project area.

Chapter 8 – Project Benefits

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

Chapter 9: Environmental Cost Benefit Analysis - This chapter includes Project Cost, cost of pollution control facilities and project implementation schedule.

Chapter 10 – Environmental Management Plan

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

Chapter 11 – Summary

This will constitute the summary of EIA Report.

Chapter 12 – Disclosure of Consultant

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

1.9 LAWS APPLICABLE TO THIS PROJECT

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

- EIA Notification, 2006 under EPA Act, 1986.
- Bihar Sand Mining Policy-2019 as amended and Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019 (as amended in 2021
- The Mines and Mineral (Development and Regulation) Act, 1957.
- The Mines Act, 1952.
- Mines Rules, 1955.
- Mineral Concession Rules, 1960.
- Mineral Conservation and Development Rules, 1968
- The Water (Prevention & Control of Pollution) Acts1974/ Rules1975
- The Air (Prevention & Control of Pollution) Acts 1981/ Rules1982
- The Environment (Protection) Acts1986/Rules 1986
- The Factory Act 1948 (as amended till 1987) & Bihar Factory Rules, 1950
- Contract Labor (Regulation & Abolition) Act 1970 & Its Central Rule 1971
- The Central Motor Vehicle Rules 1989(Under Motor Vehicle Act 1988)
- The Workmen's Compensation Act 1923 as amended up to 2000/ Rule 1924, 1935, 1991 & 1996.
- Enforcement & Monitoring Guidelines for Sand Mining, 2020
- Sustainable Sand Mining Management Guideline, 2016

1.10 TERM OF REFERENCE (TOR)

The project proposal was submitted to State Level Environment Impact Assessment Authority-Bihar for its appraisal. Based on which, presentation was held on 22.12.2022 for Terms of Reference (TOR). Based on the data provided and presentation made, ToR of proposed Sand mining project has been issued by SEIAA, Bihar vide File no-SIA/1(a)/2087/2022 dated 11-01-2023.The compliance of ToR is described below.

Table 1-1 Point Wise Compliance for ToR

Sr. No.	TOR	Compliance
1	Year-vise 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.	This is the new auctioned sand mining ghat project. LoI is attached as annexure I. The operation will be started after obtaining environmental clearance.
2	A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given"	State Govt. has given its consent to grant mining lease to the proponents. Copy of LOI is enclosed as **Annexure No. I**
3	All documents including approved mine plan, EIA and public hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.	The documents including mine plan and Draft EIA being submitted are compatible with one another. No mines waste will be generated as whole mined material is saleable. Small amount of domestic waste such as Gutkha pouch, some eatable items will be generated, will be managed by laborers itself as per existing laws. Separate bins will be provided near mine site. Mining Method-Opencast semi-mechanized. **Refer Chapter-2** for all above information's.
4	All corner coordinates of the mine lease area, superimposed on a High-	All Corner Coordinates of mining lease area superimposed on Map has been incorporated in

	Resolution Imagery toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).	EIA/EMP Report **Refer Chapter-1, Figure no-2-3** The land-use of the study area with proper demarcated features is enclosed with the report, **Refer Chapter-3, section-3.2**
5	Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.	Land Use pattern & land use map is given in chapter 3, **Refer Chapter-3, section-3.2**
6	Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.	The proposed land is a dry bed of river. The mining process will be done land use policy of the State & there is no land diversion has been proposed.
7	It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating processes /procedures to bring into focus any infringement / deviation /	Yes, the proponent Company has a well laid down Environment Policy. The hierarchical system or administrative order of the company has been given in the EIA report., **Refer, Chapter-10, Fig: -10.2**

	violation of the environmental or forest norms / conditions? The hierarchical system or administrative order of the company to deal with the environmental issues and for insuring compliances with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the EIA Report.	
8	Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.	Please refer to chapter 7 of EIA report
9	The study area will comprise of l0 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of mine/lease period.	The 10 km zone from periphery of the lease has been considered as the study area. The Buffer map of the study area is attached with report. No waste will be generated except small amount of municipal solid waste, which will be managed as per law. All the details in the EIA report are for the life of the mine period. **Refer Chapter-2.**
10	Land use of the study area delineating forest area, agricultural land, grazing	Land use pattern of 10 km from the periphery of the lease area has been prepared and incorporated

	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.	with the report. The study area lies in Son River. No National parks or WLS is found within 10 km study area, Refer Chapter-3.
11	Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use R&R issues, if any, should be given.	There is no overburden generated from this mining activity.
12	A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.	There is no forest land within the lease area. The NOC regarding this will be enclosed with Final EIA Report.

13	Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and Compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.	No forest land is involved in the lease area; therefore, deposition of net present value (NPV) and compensated Afforestation is not indicated.
14	Implementation status of reorganization of forest rights under the schedule tribes and other traditional forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.	There is no forest land involved in the leased-out area. Hence, this act is not applicable for this project.
15	The vegetation in the RF / PF areas in the study area, with necessary details, should be given.	The vegetation details of the study area is incorporated with the report, Refer Chapter-3, section 3.10
16	A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.	The details Impacts & their mitigation measures are given in chapter 4 of EIA/EMP Report.
17	Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger / Elephant Reserves / (existing as well as proposed), if any, within l0 km of the mine lease should be clearly indicated, supported by a	There is no any National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsarsite Tiger / Elephant Reserves are present within 10 km study area. Topomap on Survey of India toposheet has been

	location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.	incorporated in EIA/EMP report. **Refer Chapter-1, Fig- 1.2**
18	A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any Scheduled-I fauna found in the study area, the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.	Detailed biological study of core zone and buffer zone within 10 km radius of the periphery of the mine lease for flora fauna, endangered & endemic species has been incorporated in the EIA/EMP report. Refer Chapter-3, Section-3.10
19	Proximity to areas declared as 'Critically Polluted' or the Project areas attracting court restrictions for mining operations,	This project is not coming in critically polluted area.

	should also be indicated and where to required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. should be secured and furnished to the effect that the proposed mining activities could be considered.	
20	Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).	Not applicable
21	R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation &Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, 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	This is a River Bed Mining Project. There are no inhabited areas in the allotted mine area which lies on the Sone River, therefore no R&R Plan is proposed.

	out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.	
22	One season primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report" Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.	Baseline study was carried out for one Season from 7th Dec 2022 to 5th March 2023. Details are provided in Chapter-3 of EIA 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 wind rose has been given in chapter III of EIA/EMP Report. One location has been selected in downwind direction within 500 m from the lease boundary. The location of the monitoring sites has been shown in map. **Refer Chapter-3 & 4**
23	Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of	Air quality modeling has been carried out for prediction of impact of the project on the air quality of the area. Air Modeling has been carried out for tracking impact of air pollutant due to mining activity as well as Transportation activity. Details of Air modeling is given in chapter 4

	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.	section 4.4.1
24	The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.	The water requirement for the project is 5.4 KLD out of which 5.0 KLD for dust suppression and 0.1 KLD for use for domestic purpose and 0.3 KLD for plantation A detailed water balance is being provided in the report. **Refer Chapter-2, Table-2.5**
25	Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.	Water requirement will be fulfilled by private water tanker. So, no clearance is required.
26	Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the project, if any, should be provided.	The project does 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 in lease area.
27	Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required,	Mining activity will be done on Dry Bed of River so there is no impact on surface water. Mining will be up to 3 m below ground level or above the ground water table whichever comes

	should be provided.	first. This will not intersect the ground water table.
28	Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.	No groundwater will be intersected during mining activity. Please refer to section 10.5 of Chapter 10 of EIA
29	Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.	The project site lies on Sone River. No diversion is proposed.
30	Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.	The Elevation of the applied area is 71.85 m to 71.25 m in the stretch. Mining will be up to 3 m below ground level or above the ground water table whichever comes first.
31	A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and Quantities coverage, plant species and	Plantation/afforestation will be done as per program i.e along the road sides and near civic amenities, as per mine plan. Post plantation, the area will be regularly monitored in every season

	time frame) and Submitted keeping in mind the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.	for evaluation of success rate. List of plants selected for green belt development if incorporated in **Chapter-4. Section-4.6 under table-4.5**
32	Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.	Trucks/ Tractor will be used for carrying the minerals per day from all the sand ghats. The projection has been done based on the mineral transportation. The details of traffic analysis are discussed in the report. **Refer Chapter-4 under section 4.7.**

33	Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report	A temporary rest shelter will be provided for the workers near to the site with provisions of water, first aid facility, protective equipment's, etc. Details are given in the EIA/EMP Report. **Refer Chapter-2.**
34	Conceptual post mining land use and Reclamation and Restoration of mined out area (with plans and with adequate number of sections) should be given in the EIA report.	Refer to Chapter 2
35	Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.	Occupational health impact mainly is expected due air pollution due to fugitive dust emission because of movement of vehicles. However appropriate mitigation measures for air pollution control have been given in the report, discussed in Chapter-9. Each labour will undergo pre-placement medical examination. Thereafter periodical heath checkup will be arranged as stated in the report. Refer Chapter-10, Table-10.2 for budgetary allocation.
36	Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.	The proposed project being a small scale semi-mechanized mining project, there will be hardly any process related health implication on the population of the nearby villages except fugitive dust emissions due to transportation. Budgetary allocation is given in Chapter-10. However protective equipments will be provided & health camps & awareness programs will be arranged for them. Details are given in report.

		Refer Chapter-10.
37	Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time to time for implementation.	Socio-economic significance provided to the local community i.e., to the nearby villagers is given in the EIA/EMP Report, **Refer. Chapter-10, Section- 10.8**
38	Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project	The detailed environmental management plan to mitigate the environmental impacts has been mentioned in of the EIA/EMP Report. **Refer Chapter-10.**
39	Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.	This is draft EIA report, public hearing yet to be conduct. The PH Proceeding along with details will be submitted with Final EIA Report.
40	Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.	No litigation is pending against the project.
41	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	The capital cost of 3.9 Lakhs for capital and 7.94 Lakhs recurring cost has been earmarked for EMP. **Refer, Chapter-10. Table-10.3**

42	A Disaster management Plan shall be prepared and included in the EIA/EMP Report.	A Disaster management Plan has been given in EIA report. **Refer Chapter-7, Section 7.6**
43	Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.	Benefits of the project is discussed in detail under **Chapter -8** As per MoEFCC OM dated 30th Sept., 2020 adequate funds shall be earmarked as per the commitments made by project proponent and requirements to address the issues raised during the public hearing in lieu of corporate Environment Responsibility (CER) and this will be covered under EMP. Detailed action plan for the activities along with the budgetary allocation will be incorporated in this EIA/EMP Report upon completion of public hearing.
44	Besides the above, the below mentioned general points are also to be followed: -	
a)	All documents to be properly referenced with index and continuous page numbering.	All documents are 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.	Complied
c)	Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC / NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.	Details of testing reports of air, water, soil & noise have been enclosed in EIA report. **Refer Chapter-3.** Monitoring reports will be submitted along with Final EIA report.

d)	Where the document provided are in language other than English , an English translation should be provided	Executive summary of EIA/EMP Report is being submitted with Draft EIA report in Hindi & English Language.
e)	The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.	The Questionnaire will be submitted along with Final EIA Report.
f)	While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J/11013/41/2006/- IA.II(I) dated 4th August, 2009, which are available on the website of this ministry should be followed.	All the instructions for the Proponents and instructions for the Consultants issued by MoEF&CC vide O.M. No. J/11013/41/2006/-IA.II(I) dated 4th August, 2009 are being followed.
g)	Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with then revised documentation.	Agreed & Complied.
h)	As per the circular no. J-l 1011/618/20l0-IA.II(I) dated 30.5.2012, certified report of the status of	The EC points will be complied after grant of EC.

	compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.	
i)	The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.	Surface plan cum geological section, geological has been attached as annexure 3.
	Additional Specific Conditions	
1	Submit a report based on cumulative assessment of increase in air pollutants due to increase in traffic load in view of proposed mining activities on all the roads located within aerial distance of 10 km using suitable air model.	Cumulative assessment of increase in air pollutants due to increase in traffic load in view of proposed mining activities on all the roads located within aerial distance of 10 km using suitable air model has been done. Please refer to chapter 4.
2	To If the proposed mining lease is overlapping with the previously allotted mining lease or already working or worked out mining lease, the same must be clearly shown (on the map). The details about quantity of sand extracted from overlapped area should also be furnished duly certified from the concerned District Mining Officer.	The Mining Ghat is proposed as per the approved DSR.

3	The Satellite imageries (high resolution) of last three years in succession for summer, rainy and winter seasons of each proposed mining lease shall be submitted. A map on appropriate scale be submitted to show extraction paths to be used outside the mining lease boundary to approach major public roads (Rural/District road or State/National Highway).	Google image is attached in Annexure V.
4	Alternative route shall be explored if extraction path is passing through dense population / human settlements.	Map showing extraction path to be used outside the mining lease area to approach major public roads is attached as Fig 4.3-chapter 4
5	A Cumulative traffic management plan for cluster sand mining proposal must be submitted.	Please refer to chapter 4 sector 4.7
6	A map of the area falling within 2.5 km radius from boundary of each mining lease showing all man-made public utility features such as bridge/public civil structure (including water intake points), culverts etc. and highways, and a table showing distance of the above mentioned man-made features from the mining lease boundary to facilitate decision making pertaining to relevant rules / Guidelines be submitted.	Please refer to chapter 2 section 1.6
7	A report of the cumulative EIA / EMP study for the cluster sand mining blocks of the proposed mining site.	This is not the cluster mine lease.

2 PROJECT DESCRIPTION

2.1 GENERAL

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

2.2 TYPE OF THE PROJECT

The project is proposed for mining of "Sand" from the allotted mine lease area on River Sone It is an opencast Semi mechanized mining project**. Radharaman Construction & Marketing Pvt. Ltd, Add- Dir. – Lalti Devi, 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S-Danapur, Patna** is the project proponent who is seeking prior environmental clearance for the proposed project.

2.3 NEED FOR THE PROJECT

Sand is used in almost any type of construction activity. It is also the most important input in domestic activity. Further, the material can also be used for nonindustrial purposes. Thus, in current times, where the focus of the governments is on improvement of basic infrastructure like roads, railways, dams and other social infrastructure – both in rural and urban areas, there is a constant need for ensuring regular supply of these minor minerals.

2.4 DESCRIPTION OF THE PROJECT

The proposed sand mining project at Khata No. –104, Khasra No.- 617 Arwal Sone Ghat-5 on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur Block – Arwal, District-Arwal (Bihar) for production capacity of 161640 cum per annum or 290952 Tonnes/Year over an area of 8.98 Ha.

Table 2-1 Location Details

River Name	Khata no	Khasra no	Name of the Ghat	Area (Ha.)
Sone	104	617	Arwal Sone Ghat-5	8.98

2.4.1 Location Details

Table 2-2 Location of the Project

<table>
<tr><td>Location</td><td>Arwal Sone Ghat-5 -

<table><tr><th colspan="3">Coordinates of the Lease Boundary</th></tr><tr><td>Sl no.</td><td>Latitudes</td><td>Longitudes</td></tr><tr><td>1</td><td>25.248625</td><td>84.649784</td></tr><tr><td>2</td><td>25.24782</td><td>84.652276</td></tr><tr><td>3</td><td>25.247705</td><td>84.65339</td></tr><tr><td>4</td><td>25.248408</td><td>84.655128</td></tr><tr><td>5</td><td>25.250165</td><td>84.657477</td></tr><tr><td>6</td><td>25.25034</td><td>84.657795</td></tr><tr><td>7</td><td>25.250082</td><td>84.657799</td></tr><tr><td>8</td><td>25.24821</td><td>84.655628</td></tr><tr><td>9</td><td>25.247305</td><td>84.654468</td></tr><tr><td>10</td><td>25.245901</td><td>84.651838</td></tr><tr><td>11</td><td>25.248226</td><td>84.649405</td></tr><tr><td>12</td><td>25.248625</td><td>84.649784</td></tr></table>
At-Arwal Sone Ghat-5 on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar)</td></tr>
<tr><td>Toposheet Number</td><td>G45M7, G45M8, G45M11, G45M12</td></tr>
<tr><td>Nearest Settlements</td><td>Village- Makhdumpur, approx 0.5 KM towards South</td></tr>
<tr><td>Nearest Highway</td><td>NH 139-Approx. 0.84 Km towards East</td></tr>
<tr><td>Nearest Railway Station</td><td>Nagrigram Halt Railway Station, approx. 22.5 Km towards NW</td></tr>
<tr><td>Nearest Airport</td><td>Patna Airport, approx. 58 Km towards NE.</td></tr>
<tr><td>Nearest River</td><td>Sone River</td></tr>
</table>

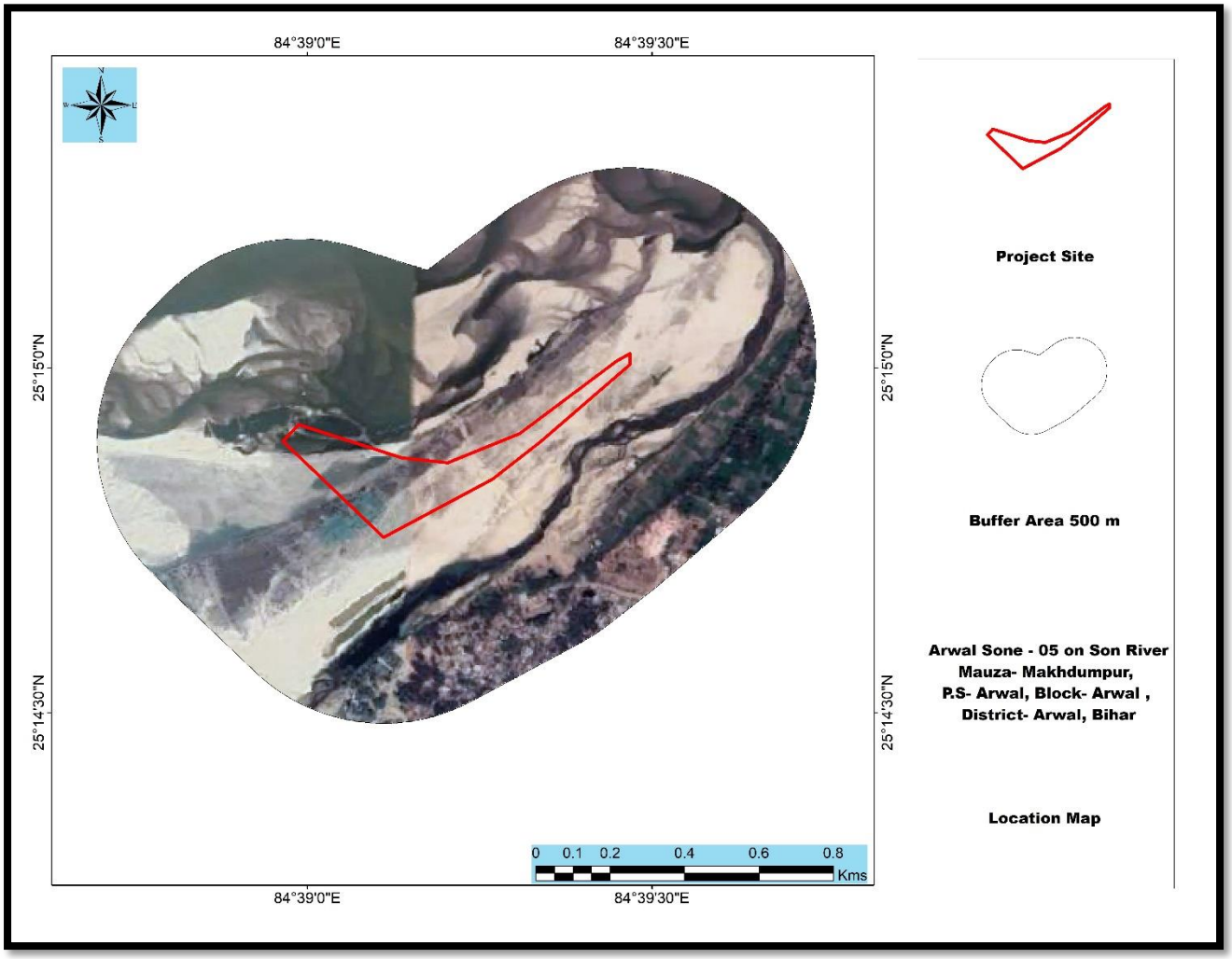


Figure 2-1 500 m Buffer Google Map

The location map and pillar co-ordinate maps of the project site is given below:

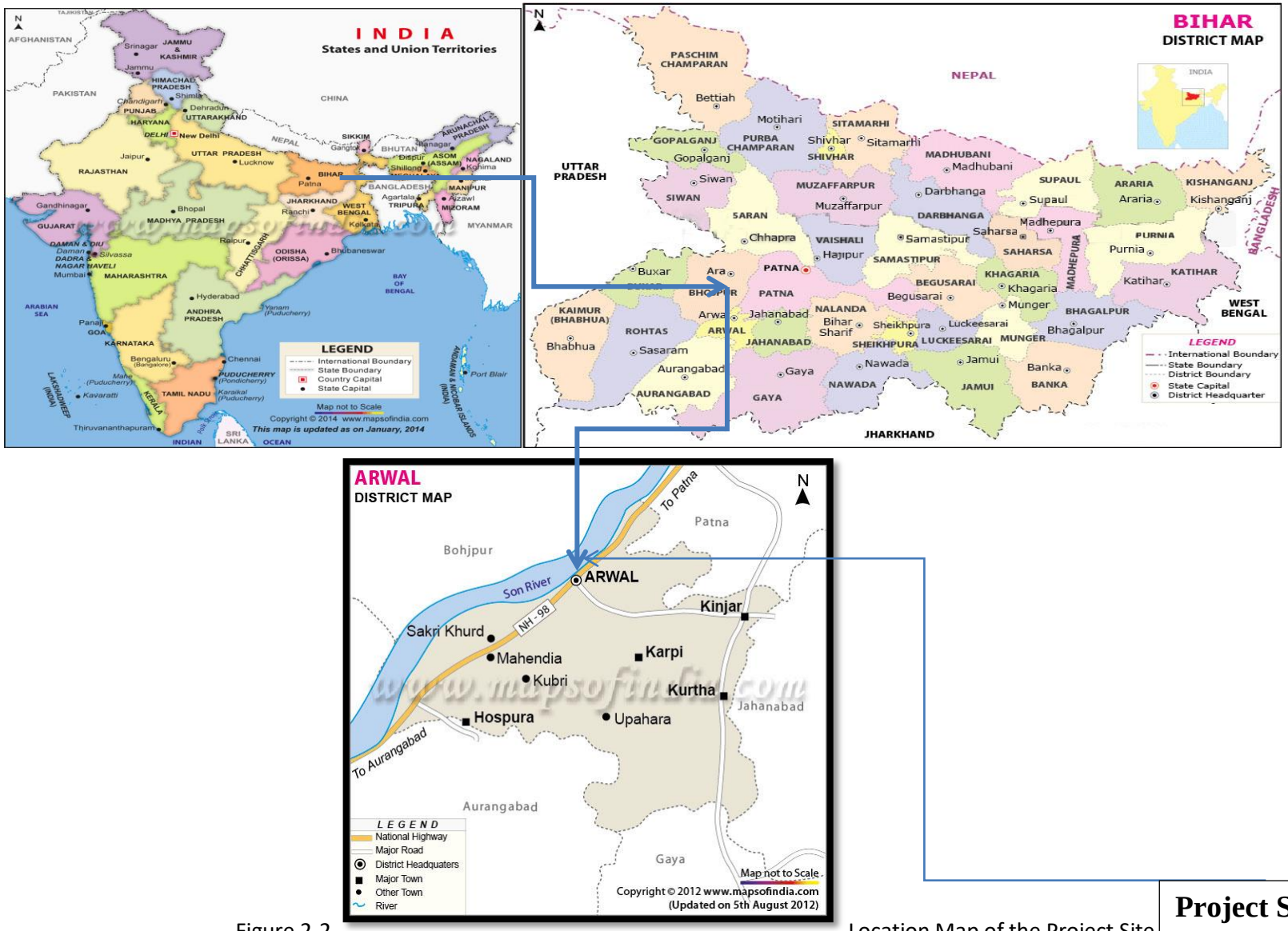


Figure 2-2 Location Map of the Project Site

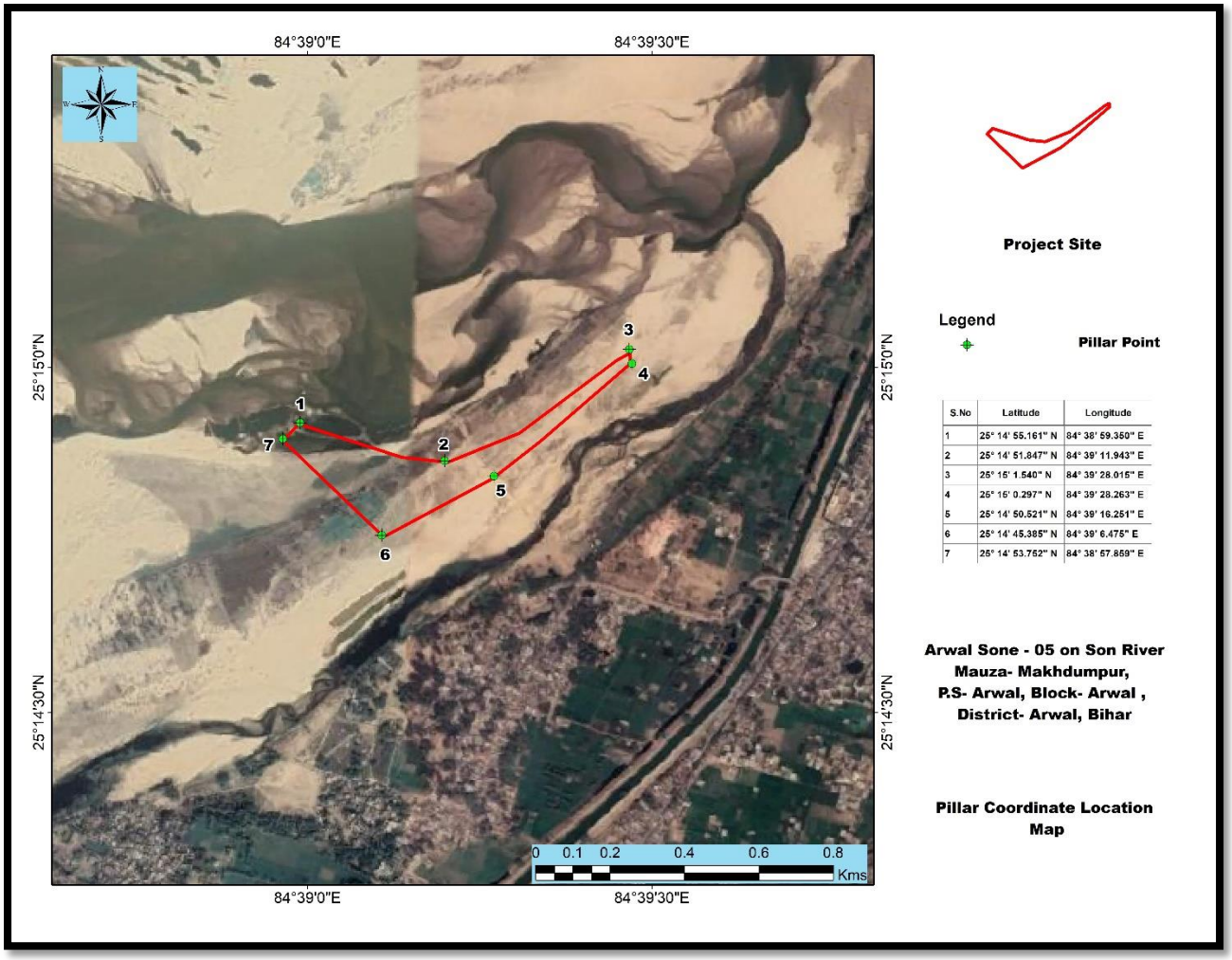


Figure 2-3 Pillar co-ordinate map of the Project Site

2.5 GEOLOGICAL PROFILE OF THE AREA

2.5.1 Topography of the Area

Arwal district is characterized by flat quaternary alluvial plain. With average surface elevation of 100 meter about mean sea level.

2.5.2 Geology

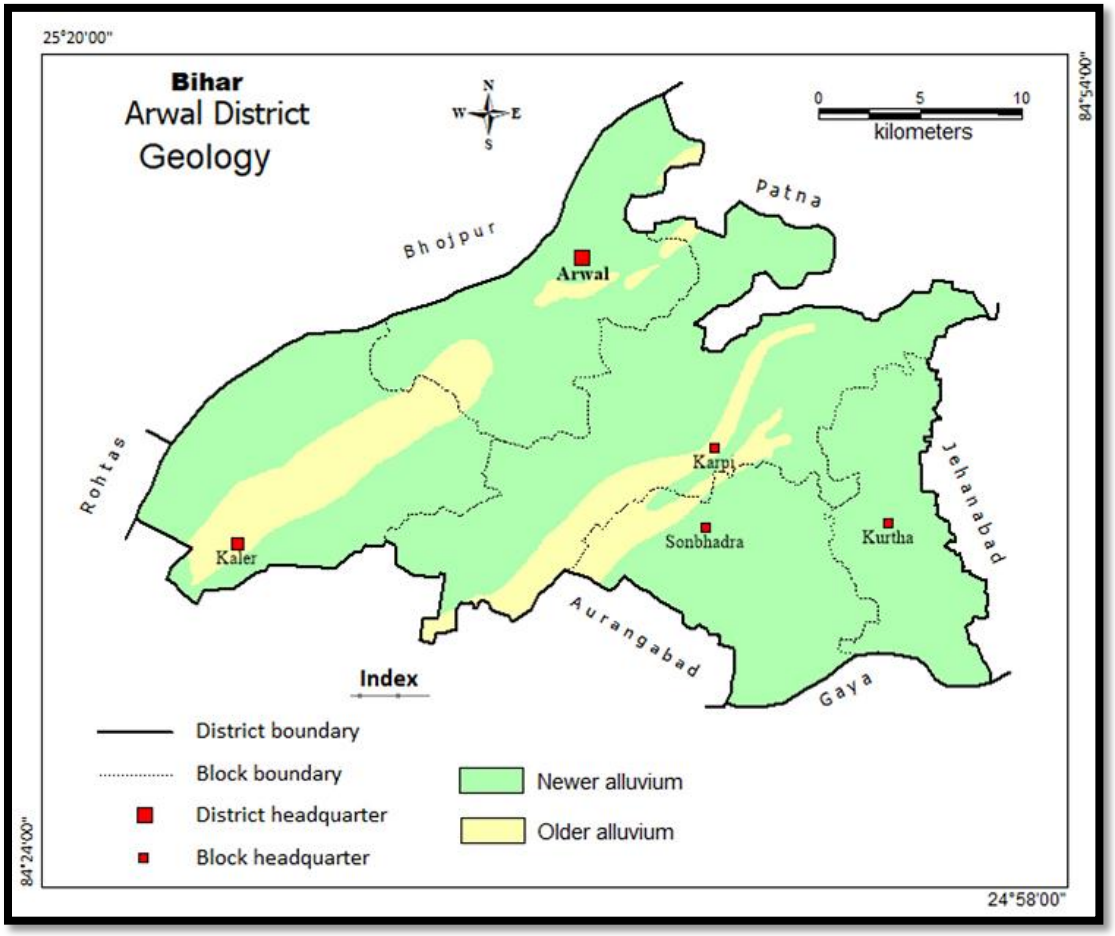
The present area of western part of earlier Jehanabd District is Arwal district. The southern part of Gaya district constitutes mainly Precambrian rocks while the northern part together with the whole Arwal & Jehanabad district is covered mainly by quaternary sediments. The hilly tract as well as the inselberg in the south are composed of Chhotanagpur Gneiss which is medium grained and associated with small isolated patches of older rocks, viz. mica-schist,

quartz-mica schist and phyllite. In the northern part of the Jehanabad district most of the area is covered by the older flood plain which having a slightly higher surface than the younger flood plain, is responsible for the splaying of the channels of rivers.

Table No. 6.1: Geological Unit of Arwal (including Jehanabad & Gaya) District

(Source: District Resource Map, Geological Survey of India, 2009)

Lithology	Formation	Age
Sand & Silt	Diara	Late Holocene
Silt & Clay with caliche nodule	Navada	Late Pleistocene to Early Holocene
Clay with weathered fragmented quartz and feldspar	Bolgarh	Early Pleistocene
Sandstone, grit, shale	Barakar	Permian
Pigmatite		Upper Proterozoic
Intrusive granite	Hazaribagh Granite	
Schist & Phyllite	Munger Group	Middle Proterozoic
Quartzite		
Dolerite		Lower to Middle Proterozoic
Porphyritic Granite		
Gabbro		
Migmatite	Chhotanagpur Gneissic Complex	Archaean (?) Proterozoic
Biotite gneiss		
Granite gneiss		
Epidiorite, Hornblende schist, Amphibolite	Unclassified Metamorphics	Archaean to Lower Proterozoic
Talc-chlorite schist		
Quartzite		
Mica schist, Phyllite		



Geological Map of Arwal District

(Source:http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Arwal%20Bihar.pdf)

2.5.3 Ganga & Sone Valley Plains:

The river Sone originates at an elevation of 600 m above msl near Amarkantak plateau in Madhya Pradesh (MP), and debouches in the river Ganga near Patna, Bihar. The total length of the river is 784 km, out of which about 500 km lies in MP, 82 km in Uttar Pradesh and the remaining 202 km in Bihar. The important tributaries of river Ganga are Sone, Mahatwain, Dharda, Dhowa, Mohani, Punpun, Morhar the total catchment area of the river is spread over 71,259 sq. km. The river has a steep gradient with quick run-off and ephemeral regimes, becoming a roaring river with the rainwater in the catchment area, but turning quickly into aformidable stream. The river being wide and shallow leaves disconnected pools of water during summer (lean period

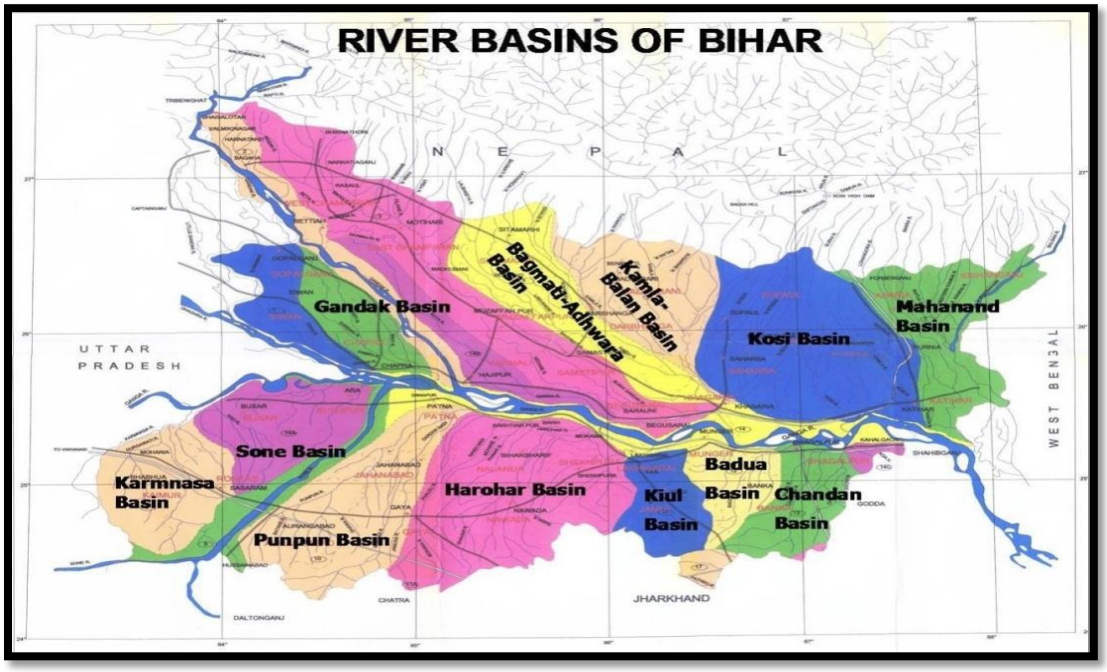
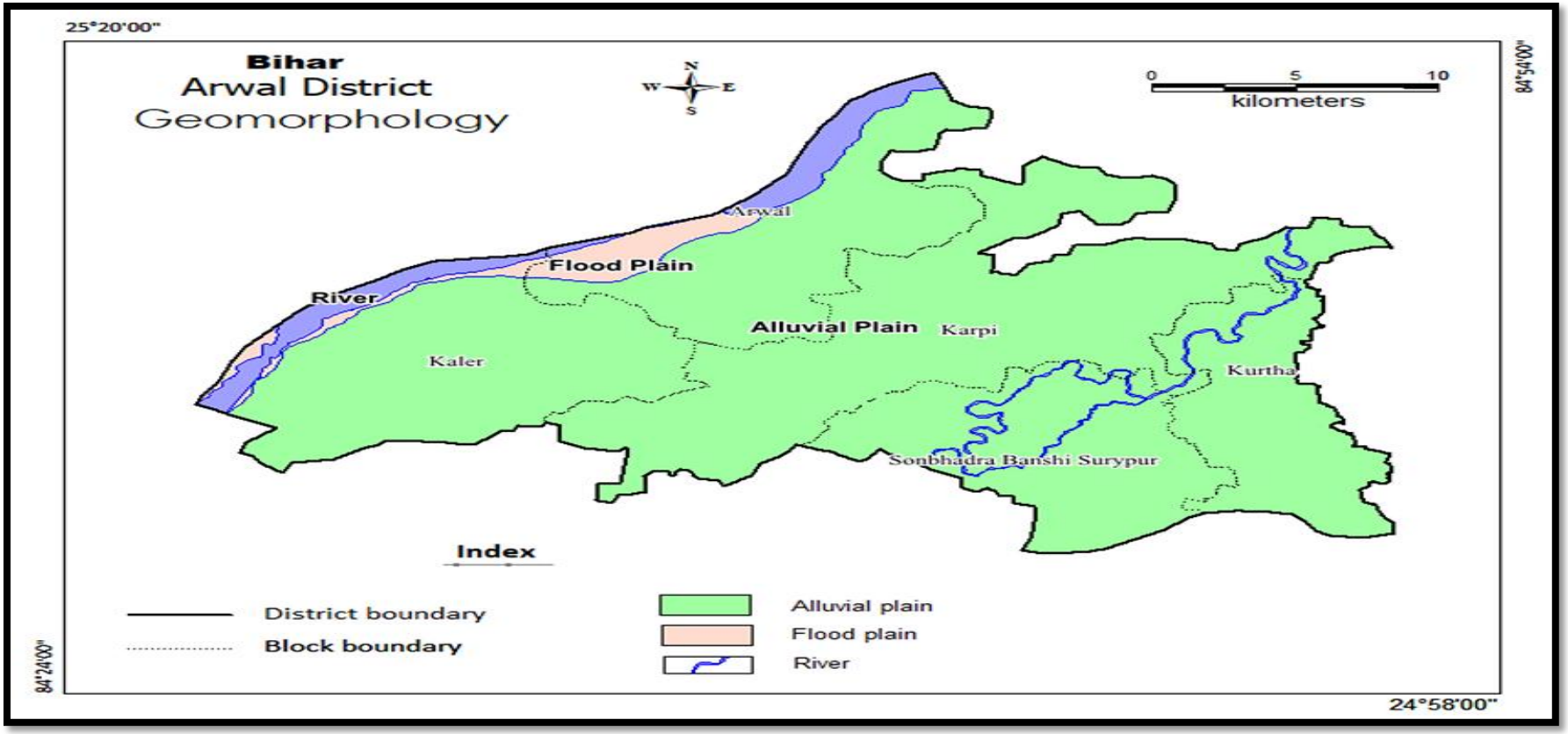


Figure 2-4 River Basins of Bihar

2.5.4 Geomorphology

Arwal district is characterized by flat quaternary alluvial plain. With average surface elevation of 100 meter about mean sea level.

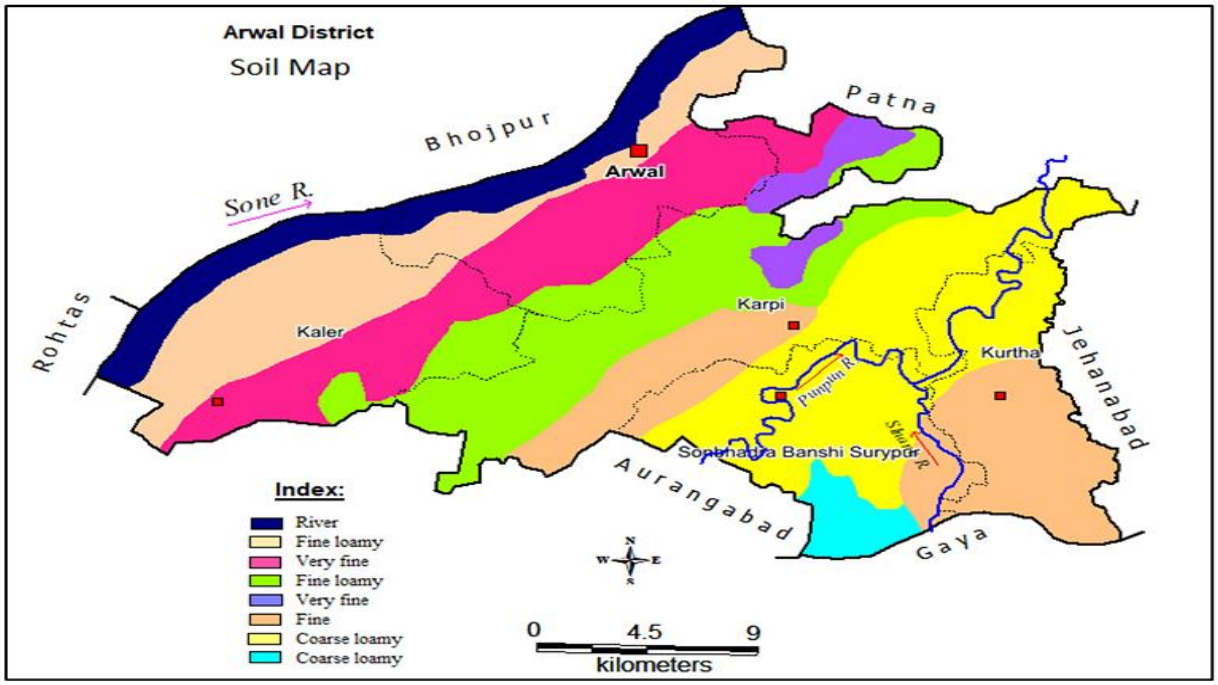
(Source: http://cgwb.gov.in/district_profile/Bihar/Arwal.pdf


25°20'00"
Bihar
Arwal District
Geomorphology
N
W
E
S
0
5
10
kilometers
84°54'00"
Arwal
Flood Plain
River
Alluvial Plain
Karpi
Kaler
Kurtha
Sonbhadra Banshi Surypur
Index
District boundary
Block boundary
Alluvial plain
Flood plain
River
84°24'00"
24°58'00"

2.5.5 Soil

The soils of the study area belong to two classes- Entisols (Younger alluvial soils) and Inseptisols (Calcareous alluvial soils). The soils of the district is rich in nitrogen and calcium and thus are fertile.

(Source: http://cgwb.gov.in/district_profile/Bihar/Arwal.pdf



Soil Map of Arwal District

(Source:http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Arwal%20Bihar.pdf)

2.5.6 Drainage

Sone & Punpun are major sand producing rivers in Arwal district. Besides the river there are many ephemeral streams. Apart from these sources there are many Tals. During the process of shifting of course these rivers leave behind cut off, meanders, abandoned channels and a number of marshes locally known as chaurs. The chaurs are also responsible for water logging in the area with the onset of monsoon and contract to become localised during summer. Apart from this drainage system there is a very good network of canal system also in this district

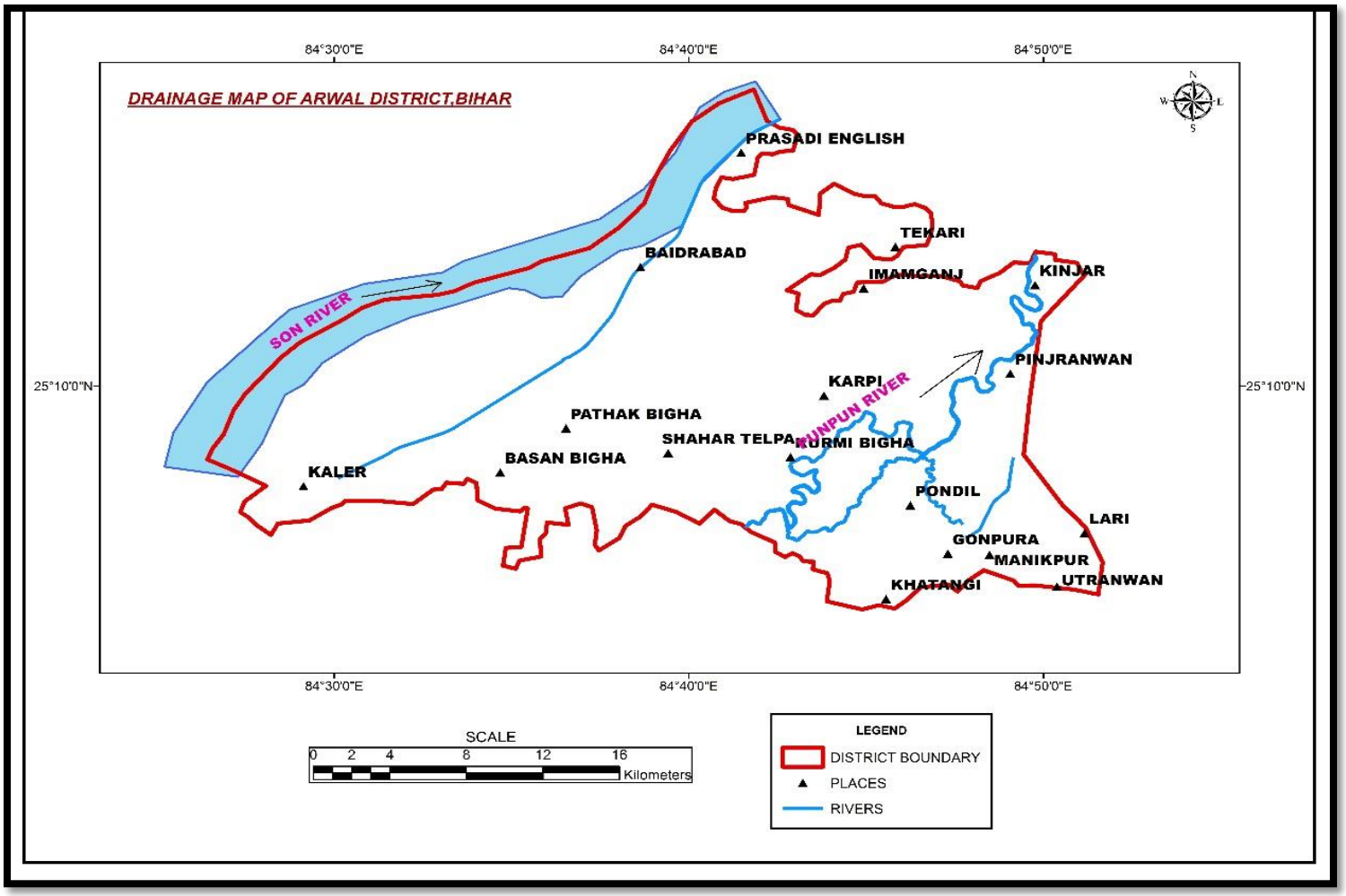

DRAINAGE MAP OF ARWAL DISTRICT,BIHAR
84°30'0"E
84°40'0"E
84°50'0"E
25°10'0"N
PRASADI ENGLISH
TEKARI
BAIDRABAD
IMAMGANJ
KINJAR
SON RIVER
PINJRANWAN
KARPI
KUNPUN RIVER
PATHAK BIGHA
SHAHAR TELPA
KURMI BIGHA
BASAN BIGHA
KALER
PONDIL
LARI
GONPURA
MANIKPUR
KHATANGI
UTRANWAN
SCALE
0 2 4 8 12 16
Kilometers
LEGEND
DISTRICT BOUNDARY
PLACES
RIVERS

Figure No. Drainage map of district area

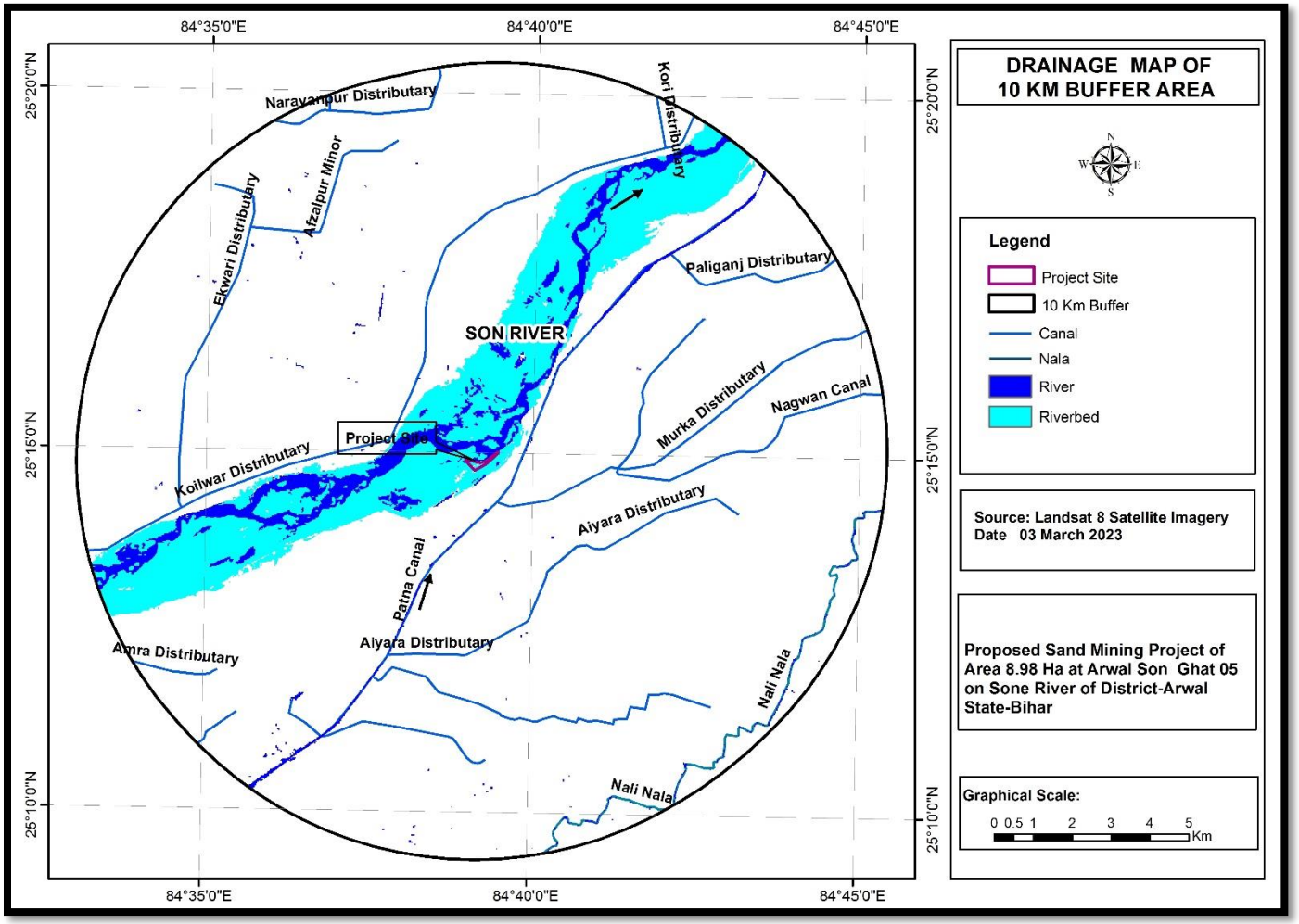


Figure 2-5 Drainage map of Study area

2.5.7 Climate and Rainfall

The area experiences a continental monsoon type of climate owing to its great distance from the sea. The climate is extreme and comprises three broad seasons-the summer, the monsoon and the winter. The summer months from the middle of March to May are characterized by hot blasts of westerly winds commonly known as 'loo'. The cold spell starts from December and continues till end of February. The monsoon sets in the end of June.

The actual average rainfall of July is 147.6 mm and of August is 168.2 mm respectively. The months of July and August receive the maximum rainfall when average monthly normal rainfall of 293.1 mm and 310.2 mm is recorded. The annual normal rainfall of the district (1901-1970) is 1027.3 mm.

(Source: http://cgwb.gov.in/district_profile/Bihar/Arwal.pdf)

2.6 HYDROGEOLOGY

Arwal is the unique district of Bihar in the sense of quality of water and its greater availability. As per survey done by the experts' underground water of Arwal is completely free from the impurities. Water is available at most of the place at much shallower depths this is the reason why most of the households of Arwal used to install handpumps instead of motors and storage. Excellent transportation, Sone River and huge availability of water in Arwal may provide suitable conditions to establishment of industries. It is the part of plain of Ganga. There are most agricultural field. Arwal District shows fairly thick regionally extensive confined/unconfined aquifers down to 300m. Ground Water potential shows large yield prospects above 150cum/hr.

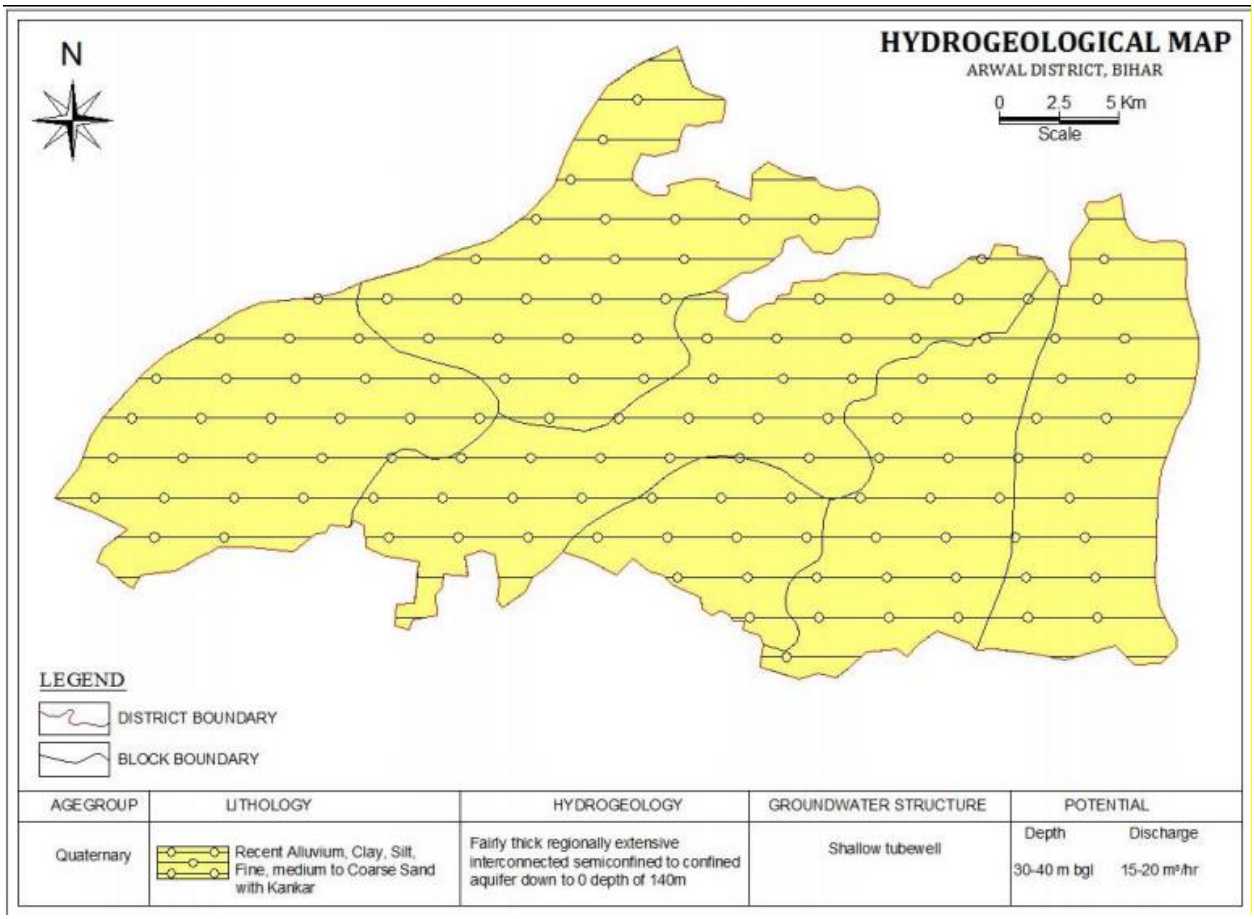


Figure 2-6 Hydrogeology map of Arwal district

Depth to water level: During pre-monsoon period observed water level ranged from 3.46 to 7.29 m bgl. The average water level calculated to be 5.37 m bgl. Majority of the area is categorized under 5-10 m bgl water level. Major part of the Sonbhadra, central part of Kurtha, bordering area of Arwal and Kaler and some other parts have shown water level between 2 and 5 m bgl.

During post-monsoon period, the calculated average water level is 4.01m bgl where water level ranged from 1.42 to 6.7 m bgl. The water level category of 2 to 5 m bgl has covered almost entire district. In southeast and northeast part of the district, water level observed > 5 m bgl. The shallowest category of <2 m bgl observed as pocket in northern part of Arwal district.

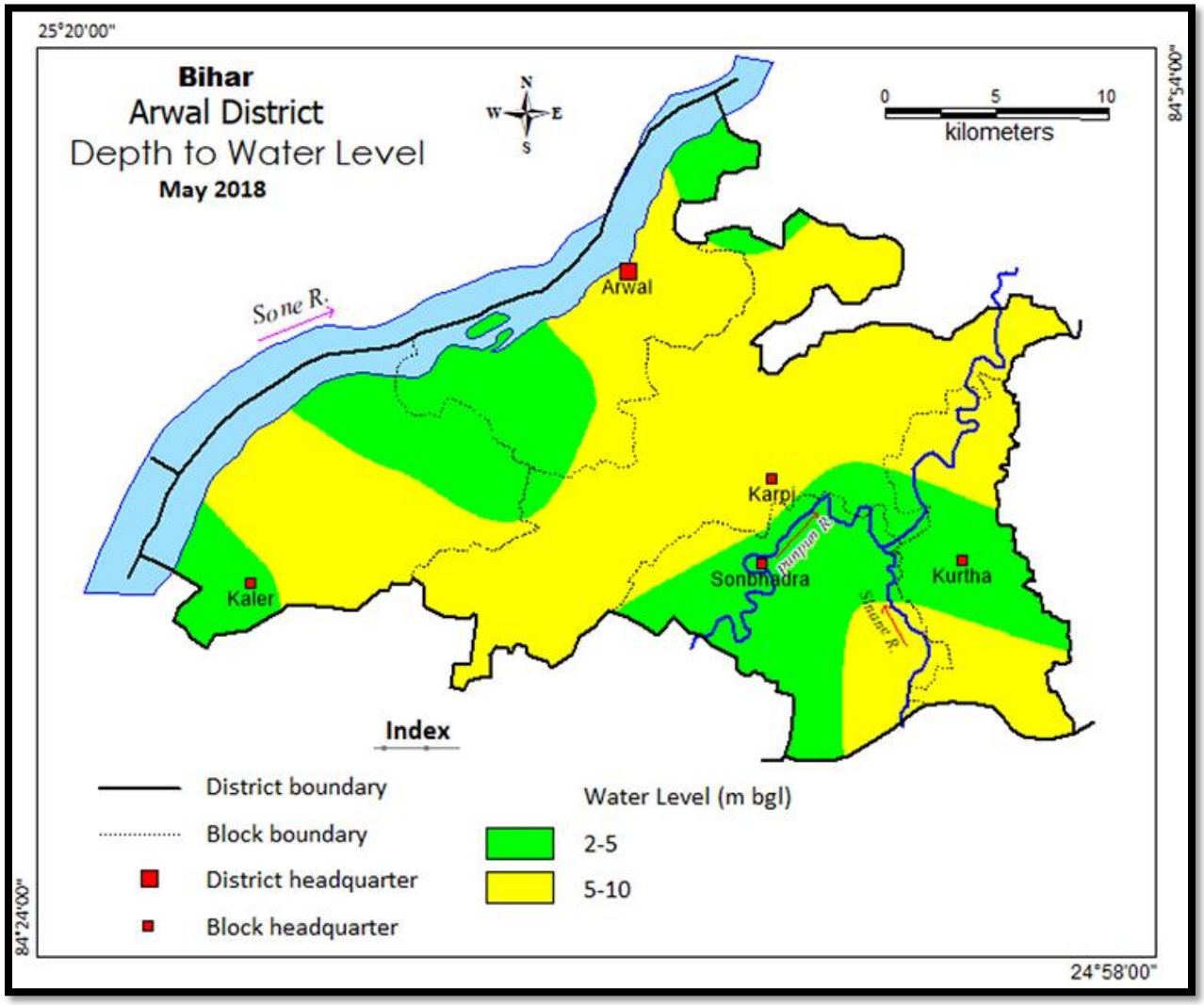


Figure 2-7 Pre- monsoon depth to water level map of Arwal district

(Source:http://cgwb.gov.in/AQM/NAQUIM_REPORT/Bihar/Arwal%20Bihar.pdf)

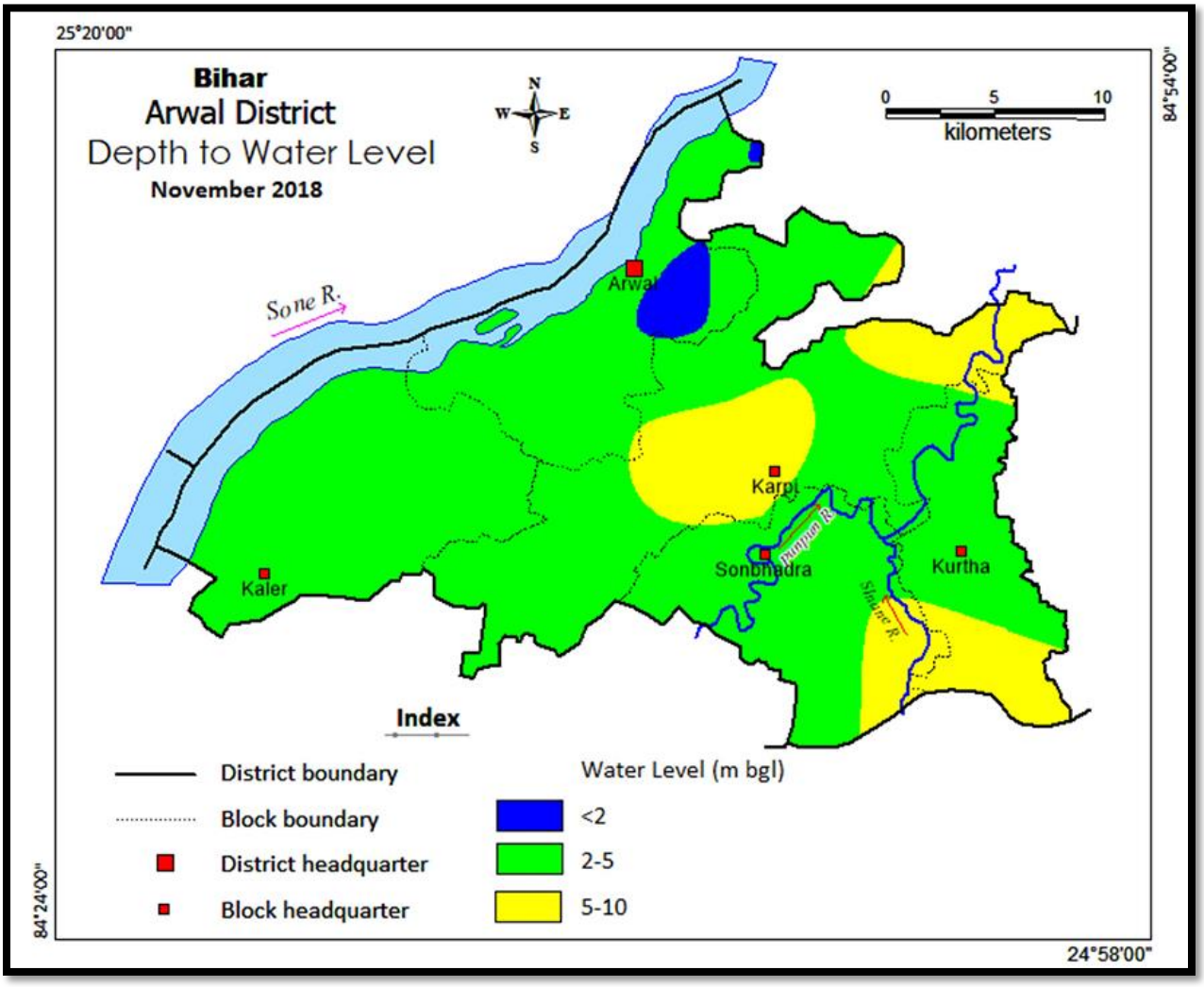


Figure 2-8 Post- monsoon depth to water level map of Arwal district, Bihar.

2.7 SEISMICITY OF THE AREA

The state of Bihar lies in a region with moderate too low to high seismic hazard. As per the 2002 Bureau of Indian Standards (BIS) map, this state also falls in Zones III, IV and V. Historically, this region has experienced earthquake in the M5.0-7.0 range. The mine lease area is located in seismic **Zone III**. This region is liable to **MSK IX-VIII** and is classified as the **High Damage Risk Zone.**

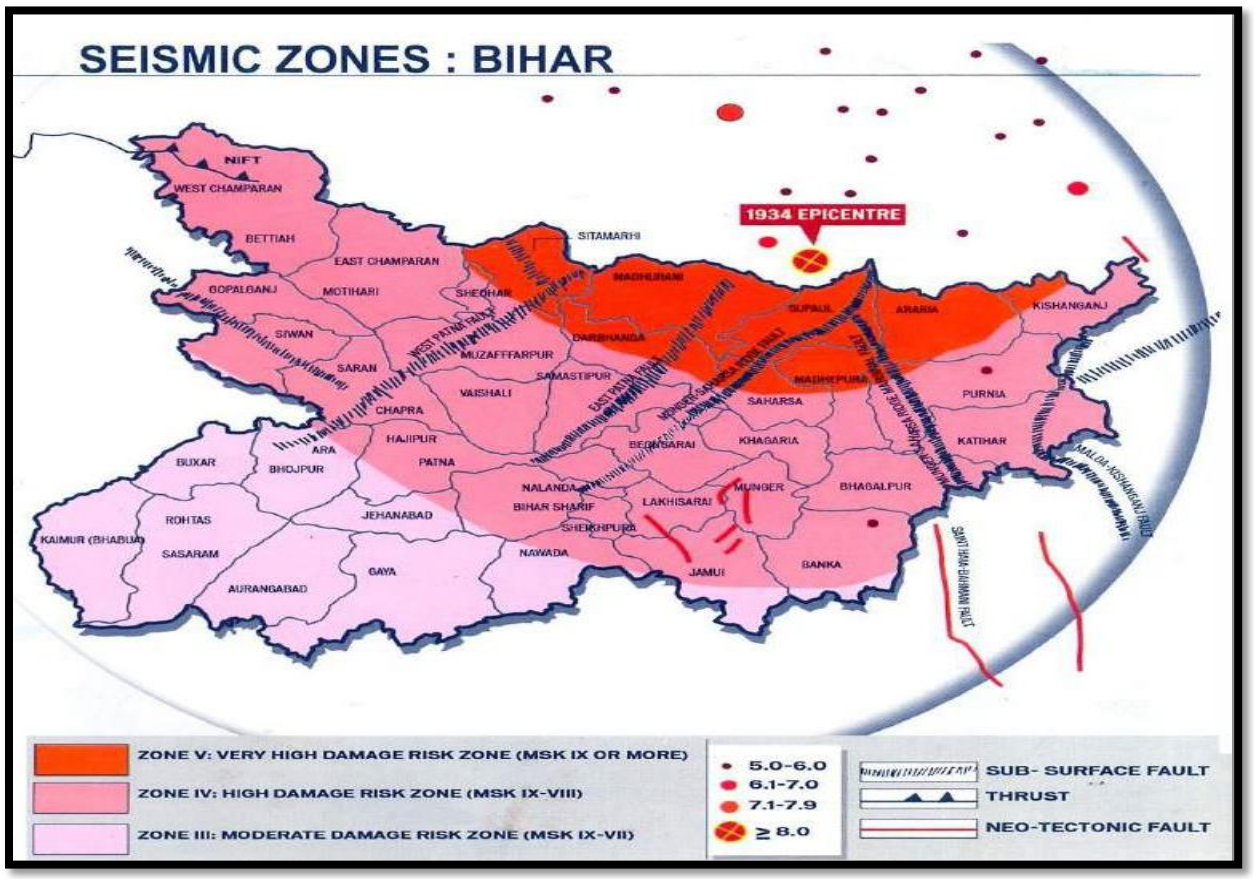


Figure 2-9 Earthquake Hazard Map of Bihar

2.8 AVAILABLE RESERVES AND PRODUCTION

2.8.1 Geological Reserves

The geological reserve of the sand has been estimated keeping the river water level as ultimate Pit Level where the mining for sand shall cease. Considering 7.5 meter of safety zone all along the lease boundary, effective area for resource calculations has been done. Resources are falling in measured (331) category while, pit slope resources are considered as 221 categories and are termed as blocked resources. After deductions of the blocked resources, remaining resources are considered as mineable and is categorized as 211 as per UNFC because the feasibility and economic axis are already analyzed prior to auction.

2.8.2 Local Geology

The sand deposits of river Son are fluviatile in nature and are result of deposition of sediments in the flood plains of its flowing course. River Son is an important tributary of river Ganga and is

perennial in nature. Being fluviatile /alluvial in nature, the topography of the area is plain and gently sloping causing the gradient for the river Son.

River bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from river banks but up to 10% of the width of the river. Mandatory distance to be left from both banks of river channel is kept in mind while deriving the mineable reserves from the geological reserves.

Table 2-3 Geological and Minable Reserve Estimation

S. No.	Particulars	Details
1.	Name of Sand Ghat	Arwal Sone 05 Balu Ghat
2.	Total Mining Lease Area in Hectare	8.98
3.	Average Depth (m)	3
4.	Sp. gr. of sand	1.8
5.	Geological reserves of sand cu. m	269400
6.	Geological reserves (tonnes)	4,84,920
7.	Mineable reserves c.u.m.	1,61,640
8.	Mineable Reserves (tonnes)	2,90,952

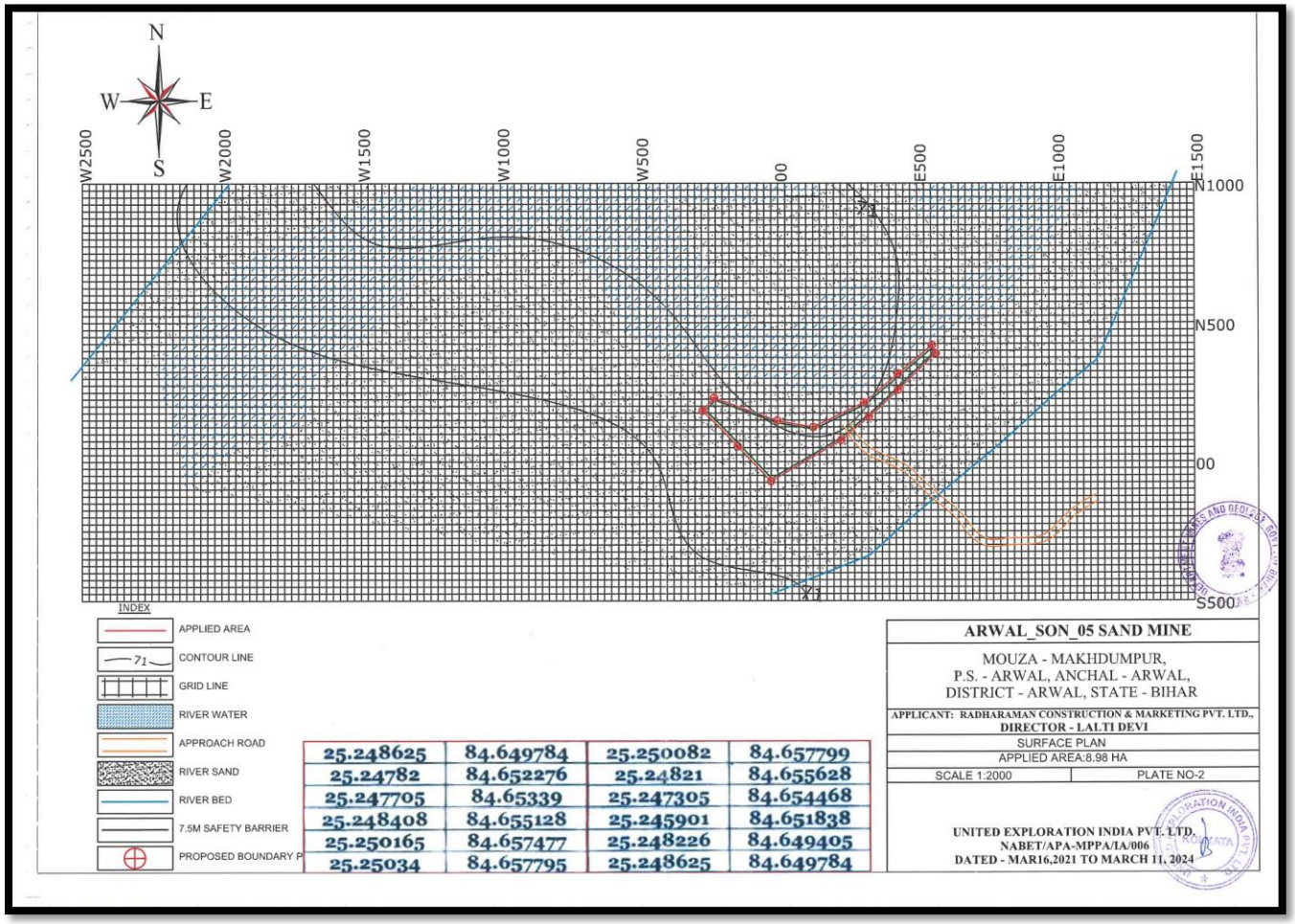
2.8.3 Targeted Production

The targeted production is 2,90,952 tonnes (1,61,640m3) up to the lease period as geological mineral reserves is 4,84,920 tonnes (269400 m^3)

2.8.4 Life of Mine

It is presumed that the mineral will be replenished every year during the rainy season. New mineral will be added every year in the river bed. The present reserves are sufficient for the proposed rate of production.

Source: *Approved Mine Plan.*


N
W
E
S
W2500
W2000
W1500
W1000
W500
E500
E1000
E1500
N1000
N500
S500
INDEX
APPLIED AREA
CONTOUR LINE
GRID LINE
RIVER WATER
APPROACH ROAD
RIVER SAND
RIVER BED
7.5M SAFETY BARRIER
PROPOSED BOUNDARY P
25.248625 84.649784 25.250082 84.657799
25.24782 84.652276 25.24821 84.655628
25.247705 84.65339 25.247305 84.654468
25.248408 84.655128 25.245901 84.651838
25.250165 84.657477 25.248226 84.649405
25.25034 84.657795 25.248625 84.649784
ARWAL_SON_05 SAND MINE
MOUZA - MAKHDUMPUR,
P.S. - ARWAL, ANCHAL - ARWAL,
DISTRICT - ARWAL, STATE - BIHAR
APPLICANT: RADHARAMAN CONSTRUCTION & MARKETING PVT. LTD.,
DIRECTOR - LALTI DEVI
SURFACE PLAN
APPLIED AREA:8.98 HA
SCALE 1:2000
PLATE NO-2
UNITED EXPLORATION INDIA PVT. LTD.
NABET/APA-MPPA/IA/006
DATED - MAR16,2021 TO MARCH 11, 2024

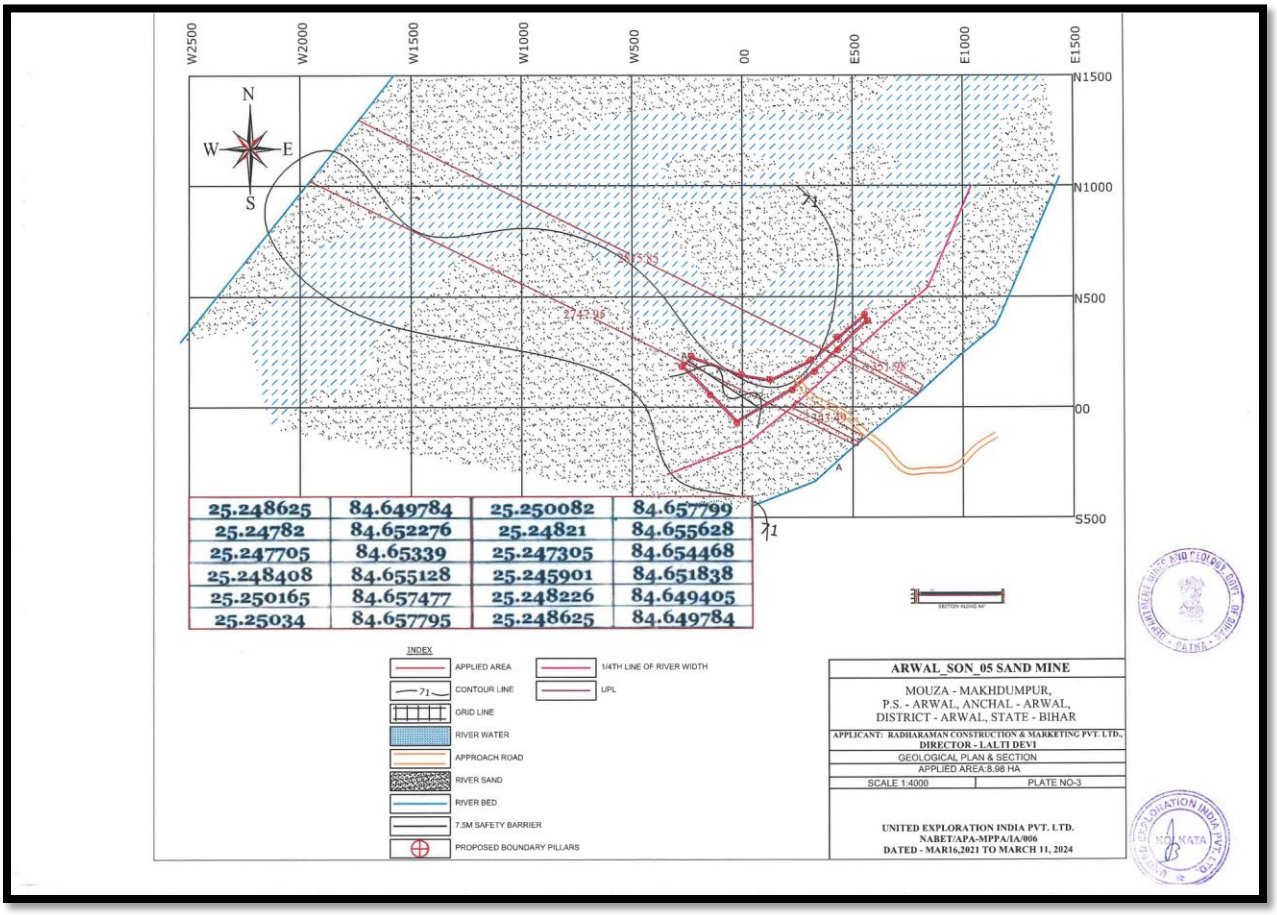


Figure 2-10 Surface plan and Geological plan & Section of Arwal Son 05 Balu Ghat

2.9 METHOD MINING

2.9.1 Proposed Mining Method –Semi Mechanized Mining.

1. The mining for the entire stretch of proposed sand ghats of river Sone, using Semi-Mechanized Method comprising use of crawler mounted JCB / Poclain back hoe (bucket capacity varying between 0.42m^3 to 1.2m^3 depending upon the quantity of sand reserves) for primary excavation/winning and loading of sand, and JCB loader for secondary loading of sand on the river banks. Trucks or tippers of 12 metric tonne capacity and requisite manpower shall be put to use to support the operating machinery.
2. The mining lease area shall be demarcated and pillars of appropriate material shall be erected at reasonable distance to identify the same. The distance of 7.5 m shall be further marked from the lease boundary and this zone constituting the 'safety zone' shall be identified.

3. The excavated sand shall be sieved at pit head to remove the silt load washed in. It shall be used in making river bank embankment to raise the bank height. This shall prevent flooding of adjoining areas.
4. The sand only fraction shall be loaded primarily at the pit head and unloaded at the secondary loading point/location on the river bank.
5. At the secondary loading point requisite, no of JCB loaders shall be deployed as given in Table to follow. The secondary loading operations shall be day and night in order to meet the demands.
6. No mining activities shall be undertaken within this 'safety zone'. This shall be in accordance of Metalliferous Mines Regulations 1961 (MMR-1961) vide Chapter-XI sr.no. 111 and section 3[(2)].
7. The sand shall be mined out in successive vertical benches/slices from top of ground surface or sand surface downwards, and shall be 1.0 meter thick.
8. At no point of time the vertical mine face shall be more than 1.0 m high. Further, the width of the bench shall be minimum 1.5 m in width in horizontal plane in accordance with the MMR-1961 sub rules. This shall prevent development of mine face more than 1.0 m high which may be cause of concern from the safety aspects. This is important to prevent machine operators/ workers from falling into the pit while working near the machinery.
9. The mining operations shall be performed between sunrise to sun set hours.
10. The use of semi mechanized mining shall require use of electricity to illuminate the working area and accordingly electricity shall be tapped after grant of due approval/ permission from competent authorities concerned.

2.9.2 Conceptual Plan of Mining

The lease period is for five years from the date of execution. Considering individual sand deposits and restricting the mining to top 3 m from the present ground surface, the sand deposit shall be worked upon up to a depth of 3 m. The mining shall cease at a depth of 3 m. A pole (wooden or metal) shall be fixed in the sand deposit at a suitable location, with datum levels - 0m to 3m painted on it to work as a guide in depth restriction. The river channel is free of water and

the ground water table lies about 6-8 m below the dry channel of the river exposed. In general, this condition prevails in almost all of the sand deposits on this river stretch.

The mineralized zone or the sand zone in particular of the river does not follow any specific trend. It occurs as lensoid body. The relative occurrence of ground surface with the sand zone thickness varies from place to place and depends upon factors such as stream/river flow characteristics, geometry of the river banks, sediment load, rate of water flow, rainfall and surface run off characteristics etc. The sand deposit extends to depth of at least 200 m. However, due to UNFC guidelines on reserve estimation, sand reserves have been considered to few meters below the minable depth of 3m.

In view of this, it is not possible to prepare a conceptual plan due to lack of specific spatial trend of the sand zone.

The longitudinal section of the river channel is explained in the Figure 2.11 given below. The longitudinal section exhibits the generic upstream to downstream flow of river along with the sand deposits contained with it. AS seen in the illustration, the top surface of the sand deposit is undulating and gently dipping and the contours of sand deposit vary with the factors a enumerated in above paragraph.

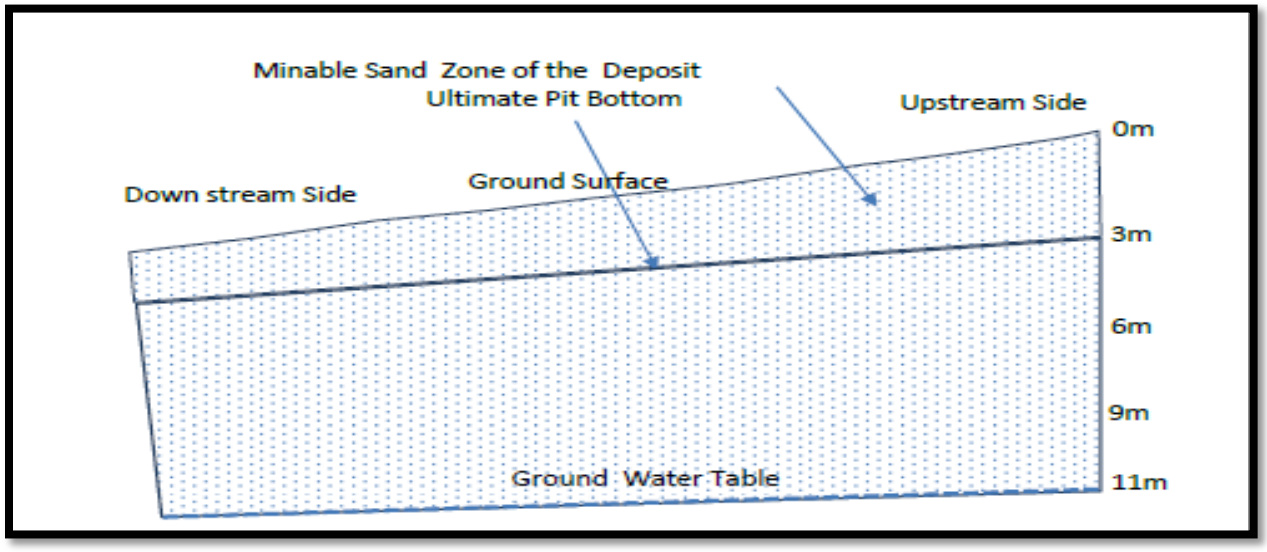


Figure 2-11 Conceptual Longitudinal Section of River Channel

2.9.3 Machinery Requirement

This is a new mining contract. Following equipment's is proposed to be deployed for the desired production.

Table 2-4 List of Machinery

S. L. No.	Name of Machinery	Capacity (Cum) / Ton	Max. Nos.	Fuel Consumptions (Lit Per Hour)	Fuel Consumption in day (Liters)
1	JCB/ Shovel	1.20	1	12	120
2	Trucks Tippers	12	3	7.0	210
3	Water Sprinklers	4	1	4	40
4	Light vehicles	-	1	3	30
5	Tractor	4	2	2.5	50
			TOTAL		**450**

2.10 TRANSPORTATION OF MINERALS

Mineral Sand will be transported by trucks. Loaded trucks will travel on Kaccha road made for plying of trucks. The temporary road will provide access to the river bed and the movement of loaded trucks. The village has its outlet meeting the tar road on the nearby villages and from where the mineral is sent to various destinations. Similarly, mineral will be transported on the other side through approach roads which finally merge with tar roads for final destinations.

2.11 MINE DRAINAGE

The water table in the river occurs at a depth of 6-8 meters during post monsoon period while it remains at a depth between 3-4 meters below the ultimate pit bottom depth of 3m as measured from the highest elevation on the ground surface.

During the course of mining, the water table in the river shall not be intercepted. The mining shall be restricted to the top 3 m from the general ground level.

Ground water shall not be intercepted during the mining of sand. In view of it, dewatering of sand pits shall not be required or discharged elsewhere.

2.12 STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE

The present sand mining locations do not have significant top soil/clay layer to be preserved elsewhere during the mining operations.

The sand deposits inherit gravels, pebbles with them being a part and parcel of river system.

During the field visit and information gathered during discussions with concerned people, 5%of the geological reserves occurring in the sand ghats are provided for these inclusions and accordingly these have been considered during the minable sand reserves.

2.12.1 Disposal of Waste (Reject) materials Silt

The proposed project is the mining of sand from dry part of riverbed, all the excavated material will be saleable, therefore no mines reject will be generated. Some amount of silt may generate will be used in haul road development.

2.12.2 Land chosen for disposal of waste with proposed justification

There shall be no waste materials generated during the course of sand mining. Therefore, disposal of solid wastes resulting from the sand mine shall not be required.

2.13 USE OF MINERAL

Deposit is moderate to good quality Sand. It is widely used in construction, buildings, bridges and other infrastructure. It is free from clay and non-sticky in nature.

Source: *Approved Mine Plan.*

2.14 UTILITIES AND PROPOSED SITE FACILITIES

2.14.1 Water Requirement

The total water requirement will be 5.4 KLD. This water will be supplied by private tankers.

Drinking water will be made available at site by the private tankers.

The details of Water uses are given below:

Table 2-5 Water Requirement

Activity	Water Requirement (in KLD)
Dust Suppression	5.0
Domestic	0.1
Green Belt Development	0.3
Total	**5.4**

2.14.2 Power

The material will be excavated by open cast semi method and loaded directly into tractors by the workers themselves. The operation will be done only from sun rise to sun set. So there is no power requirement for the mining activity.

2.14.3 Manpower

Total manpower required for the project will be **10** Workers. Break up of manpower requirement is given below.

Table 2-6 Manpower Details

Category	No. of Shift	Absenteeism	Total Manpower
Transport Manager	1	10%	1
Supervisor	1	10%	1
Time Office	1	10%	1
Others	1	-	6
Operators	1	10%	1
	TOTAL		**10**

2.14.4 Infrastructure and Site Facilities

Infrastructure facilities like site office, first aid station, rest shelter, potable drinking water facility etc. will be established within the mine area. The following infrastructure facilities will be made available for the workers:

a. First Aid Facility

A first aid facility will be made available at site with proper equipment will be maintained as per Mines Act and Mine Rules at the mine site office. First aid -box with all necessary facilities will be maintained and provided.

b. Temporary rest shelter

The Temporary rest shelter for the workers working in the mine and also to provide tea etc as the laborers will come from nearby villages at day time only.

c. Washroom

Washroom facility will be provided to the laborers nearby the site.

2.15 PROJECT COST

The project proponent will incur a total cost of **Rs. 325.19 Lakh s**and may vary from place to place and with magnitude of the sand mining. This will include cost of labour, cost of transportation, fuel charges etc.

Table 2-7 Breakup of Proposed Project Cost

S. No.	Description	Cost in Rs.
1	Auction cost	31519800/-
2	Cost of Labour & Equipment	900000/-
3	Miscellaneous	1,00,000/-
TOTAL		**32519800/-**

3 DESCRIPTION OF ENVIRONMENT

3.1 GENERAL

Sand is site specific mineral, which occurs mostly along the river beds and flood plain. Mining activities invariably affect the existing environmental status of the site. It has its own pros and cons and in order to maintain the environmental commensuration with the mining operation, it is essential to undertake studies on the existing environmental scenario and assess the impact on different environmental components.

3.1.1 Study area

The study area is divided into core and buffer zone in view of scientific study. The core zone is the lease area of the mining site and from the boundary of the lease area upto 10 km radius is called buffer zone. The study of the proposed project was undertaken for assessing the base line status of Environmental Parameters like Land, Air, Water (both ground and surface), Soil, Noise and Biological (both flora and fauna) and socio-economic status.

Baseline data has been collected out during the 7th December 2022 to 5th March 2023 by ENVIRO-TECH SERVICES. NABL & MOEF accredited Lab. Correspondence address & Lab: -Plot No. 1/32, South Side G.T. Road Industrial Area Ghaziabad (UP)-201001. Head Office: - G-232, M.G. Road Industrial Area, Harpur -Ghaziabad (UP)-201015 in accordance with the Guidelines for EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Team of Experts visited the study area for Social & Biological Environment study. The following data, through field survey and other sources, has been collected by ENVIRO-TECH SERVICES, for preparing the EIA/EMP for the proposed mining area with related facilities.

- Physical environment (Air, Water, Soil and Noise) baseline data.
- Relevant meteorological data, for previous decades from Indian Meteorological Department (IMD) and primary data.
- Identification of water bodies, hills, roads etc. within 10 Km radius.
- Eco-sensitive places, sanctuaries, biosphere reserves within 10 Km radius.
- Religious places / historical monuments and tourist places within 10 Km radius.
- Study of present environmental protection and mitigation measures in nearby operating similar projects, if any.

3.2 LAND ENVIRONMENT

Landcover data highlights the area covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types. Water types include wetlands or open water. Landuse shows how people use the landscape for development, conservation or for other purposes. Therefore, its highlights the current scenario as well as predict the impact.

1. **Objectives:** Main objectives are:

   - To prepare the landuse landcover map of study area based on recent satellite imageries.
   - To assess the impact of proposed project on existing landuse and landcover
   - To suggest mitigations measures

2. **Hardware:** The equipment used during the present investigation includes ground truth by hand held GARMIN 12 GPS receiver for ground truth collection, besides the visual observation and analysis.
3. **Software:** The following software were applied to extract indicators and maps:
   - **ERDAS Imagine:** The Erdas imagine version 2016 is used to process Landsat-8 satellite data and to extract the required indicators through spatial & spectral analysis.
   - **ArcGIS:** The ArcGIS version 10.3 has been used to prepare the final Maps for indicators through the outcomes of ERDAS software.

4. **Methodology:** The methodology applied for the study involved obtaining satellite images from open source, and then using a range of software to process the images and also by GPS coordinates (ground truthing) for drawing observations. The detailed methodology is explained as below:

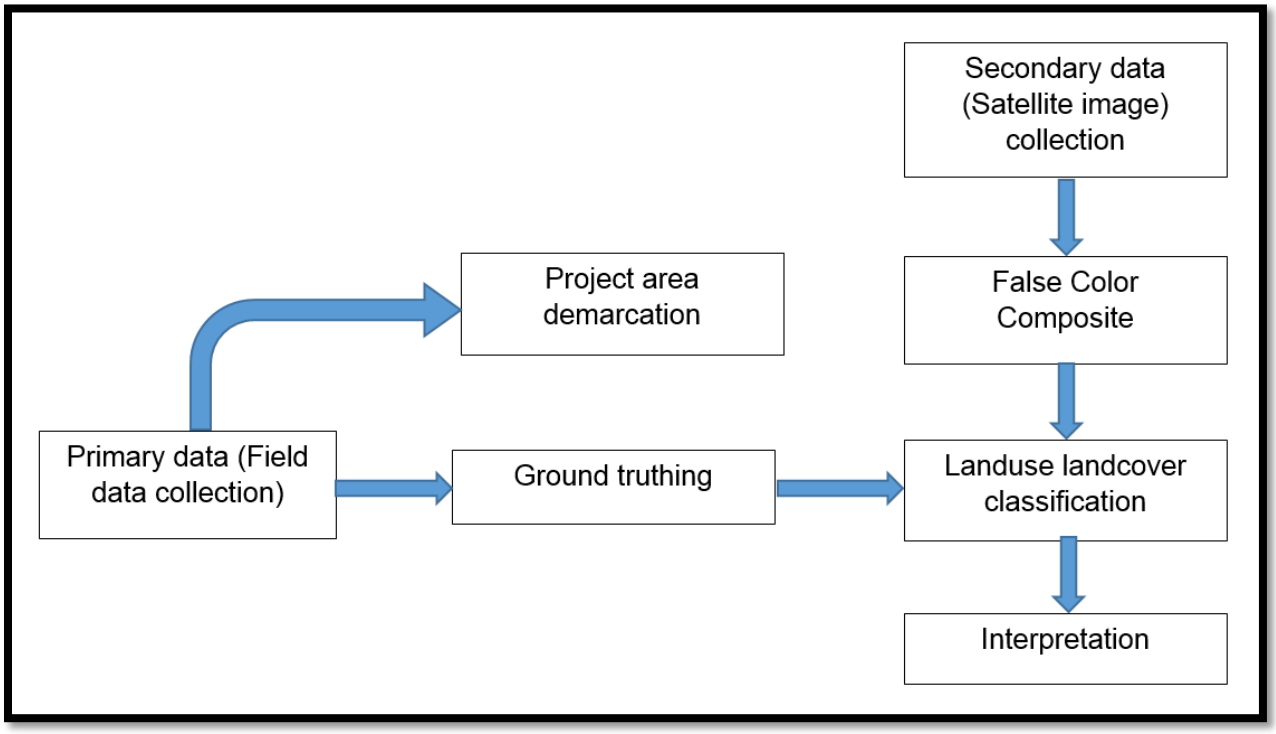


Figure 3-1 Flow Chart: Methodology

- **Primary Data:** The coordinates along land features of project area is collected with the help of GPS device for ground truthing. This data is primary data. On the basis of this data, land use landcover analysis is appropriate.

- **Secondary Data:** Satellite image (secondary data) is required to show the current land features of the project area and buffered area (10 km). **Landsat 8** Satellite image is used, which is collected from open source.

The path, row, date, resolution of satellite data used were as follows.

Path	141
Row	43
Date of pass	03 March 2023
Resolution (panchromatic)	15 Meter

Landsat 8 Operational Land Imager (OLI) and Thermal Infrared Sensor (TIRS) images consist of nine spectral bands with a spatial resolution of 30 meters for Bands 1 to 7 and 9. The ultra-blue Band 1 is useful for coastal and aerosol studies. Band 9 is useful for cirrus cloud detection.

- False Color Composite (FCC): False color (or false colour) refers to a group of color rendering methods used to display images in color which were recorded in

the visible or non-visible parts of the electromagnetic spectrum. A false-color image is an image that depicts an object in colors that differ from those a photograph (a true-color image) would show. False-color image sacrifices natural color rendition in order to ease the detection of features. The FCC for 10 km buffer zone of the project area is shown in Figure 3.2.

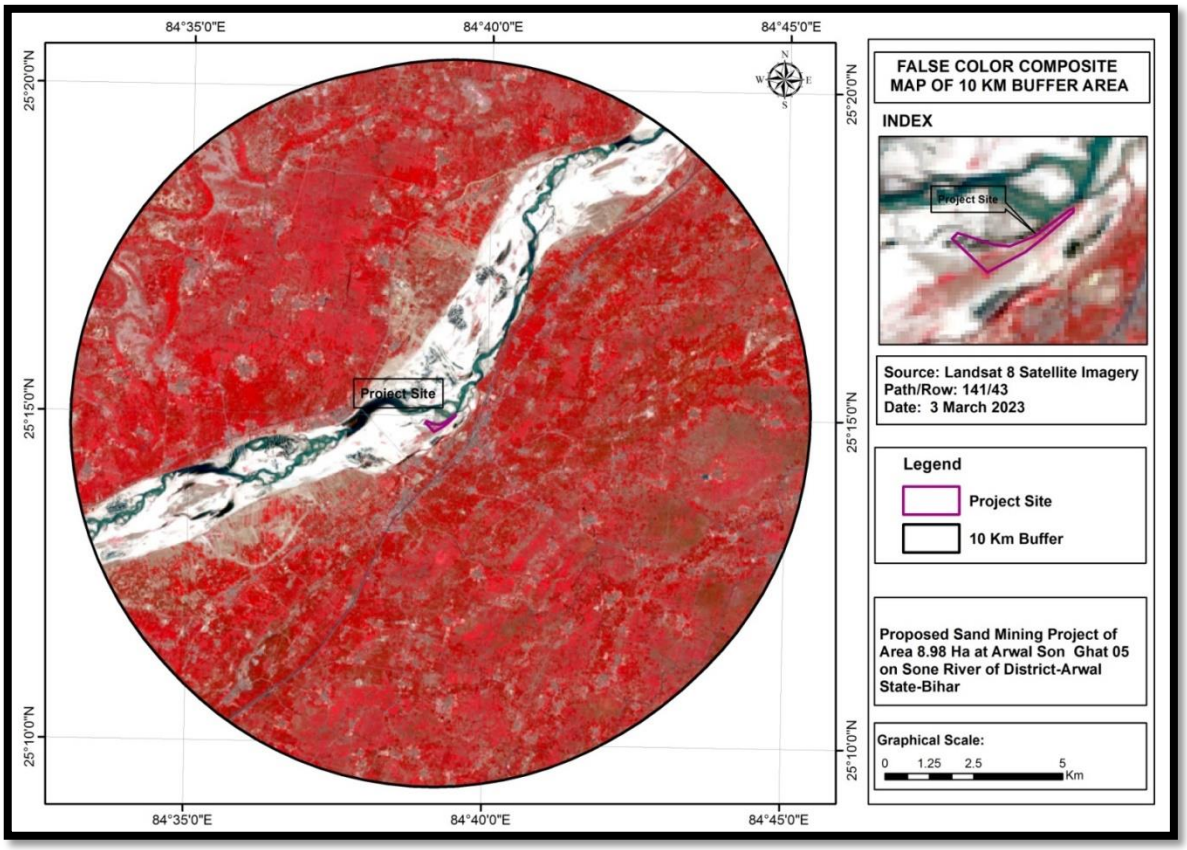


Figure 3.2: Shows the False color Composite Map of the study area

- **Land use landcover classification & Interpretation:** The classification approach is applied on the basis of various characteristics like colour, texture, shape, association etc. The Land use landcover map for 10 km buffer zone of the project area is shown in figure 3.2

  The unsupervised classification approach was obtained for the Landuse and Landcover classification by using ERDAS Imagine software. In this approach, the pixels of the project area are clustered in several classes on the basis of spatial & spectral variation in pixel value which are following:

I. **Built-up land:** 3.22 per cent of the total project area is covered by built-up land. The entire built-up land comes under rural areas. This area is identified by grey color and square/rectangular shape in the satellite image. Built-up land can be described as an area of intensive use with much of the land covered by structures. Areas included in this category are cities, towns, villages, strip developments along with highways, transportation, power, and communications facilities, and other areas such as those occupied by mills, shopping centers, industrial and commercial complexes, and institutions that may, in some instances, be isolated from built-up areas.

II. **Agricultural land:** 62.43 per cent of the total project area is covered under agricultural land. Agricultural land may be defined as the land that is used primarily for the production of food and fiber. In the satellite imageries, cropland is identified by light pinkish to dark pinkish color or red, fine texture and rectangular/square shape.

III. **Agricultural fallow land**: It is the type of cropland which is not seeded for a season so as to allow the fields become fertile again. The practice of allowing fields to remain fallow dates back to ancient times when farmers realized that using soil over and over again depletes its of its nutrients. Agricultural fallow land covers 20.43 per cent of the total project area.

IV. **Open Land:** Open land is any degraded land or a land which is currently underutilized but can be brought under vegetative cover with reasonable efforts. This type of land covers 1.83 per cent of the total project area. This area is identified by off-white color and rough texture in the satellite image.

V. **Water Bodies:** All natural and man-made ponds, reservoirs, river come under this class. A river is a natural flowing watercourse, usually freshwater, flowing towards an ocean, sea, lake or another river. In some cases, a river flows into the ground and becomes dry at the end of its course without reaching another body of water. This feature is identified by dark blue to black color, fine texture in the satellite image and cover only 2.81 percent of the total project area.

VI. **Riverbed:** A riverbed or streambed is the channel bottom of a stream or river, the physical confine of the normal water flow. The riverbed of the project area is consisting of sand and cover only 9.28 percent of the total project area. This area is identified by white color and fine texture in the satellite image.

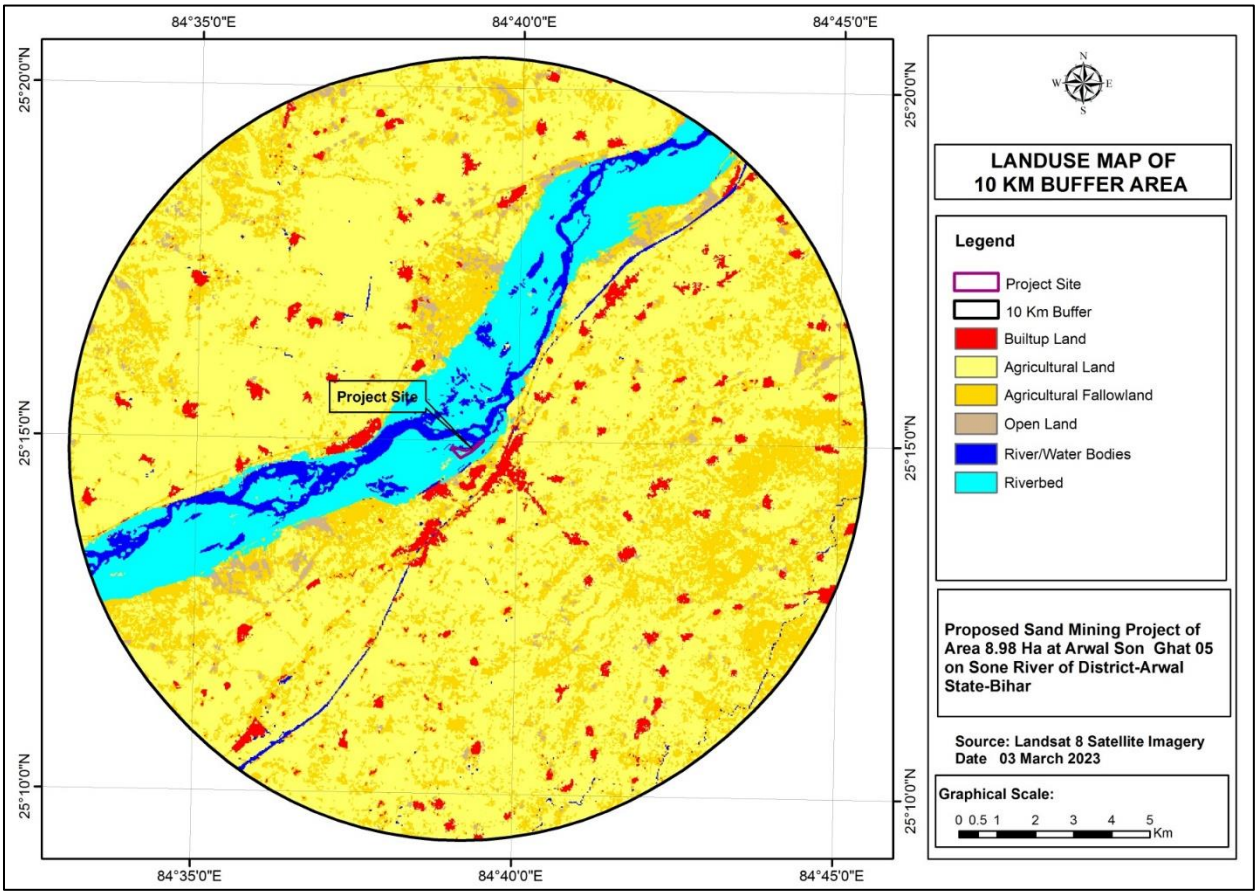


Figure 3-2 Land use landcover classification

On the basis of the land use landcover classification, the area of different land features are as follows:

Table 3-1 Land use classification

Class Name	Area (Ha)	Area (%)
Built-up Land	1077.39	3.22

Agricultural Land	20908.40	62.43
Agricultural Fallowland	6843.44	20.43
Open Land	614.45	1.83
River/Water Bodies	940.88	2.81
Riverbed	3107.00	9.28
Total	33491.56	100.00

In this connection, pie chart of the land use landcover is shown in figure 3.3 which is prepared on the basis of the above table.

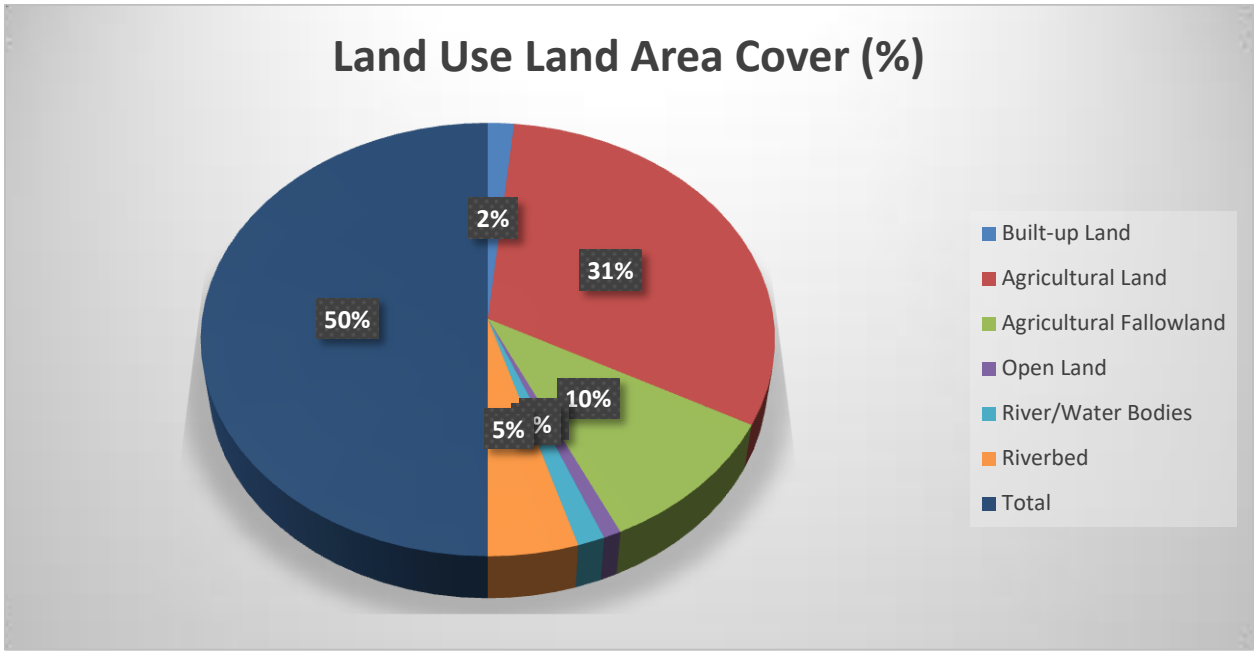


Figure 3-3 Pie-chart of Land use landcover area

Impact Analysis:

Indiscriminate river sand mining directly influences the shape of the riverbed. This often results in many indirect and cumulative effects on the physical characteristics and the dynamic equilibrium of erosion and sedimentation of a river. Excessive sand mining can alter the river bed, force the river to change course, erode banks and lead to flooding

Mitigation measurement:

Mitigation measures are means to prevent, reduce or control adverse environmental effects of a project, and include restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means. The mitigation measures are as follows:

1. Excessive sand mining should not be done.
2. Ensure conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system. Ensure the rivers are protected from bank and bed erosion beyond its stable profile.

On the basis of the classification, it is clear that approx. 20.43% & 62.43% area of the total project area is covered by agricultural land and agricultural fallow land. The land has the capability to produce abundant vegetation or crops. The population is well scattered all over the area. The primary occupation of the main workers is cultivation. The area has potential to increase its population as well as enhance its economic growth.

3.3 SOIL SAMPLING

Soil, defined as a thin layer of earth's crust, is the medium for the growth of plants, comprises of both physical and chemical properties significant to the project. The baseline study covers collection of soil samples and determining relevant physical and chemical properties. The district is transected with rivers like Ganga, Sone, Dharmawati, consists of sandy loam, loamy sand and sand, whereas, the area away from the river channels consist of silty sand to sandy silt. The soils in general are fine textured away from the river course and rivulets and coarse textured along their courses. The soils of coarse textured have got mixed with silt and fine sand due to the mixing of canal water being used perennially for irrigation.

3.3.1 Methodology

Soil sample collection was done making a pit about 15 inches deep and heaping the loose soil dug out. The loose soil is spread up in a circle and divided into 4 quadrants. The opposite quadrants are chosen and again the process is repeated till we get the required quantum of sample

for analysis purpose. Collection of samples was done from 5 locations as shown in Table 3.2 & Figure 3.4. Samples were analyzed as per CPCB guidelines.

The physio-chemical characteristics of these soil samples are given in Table No. 3.3.

Table 3-2 Soil Quality monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
SQ1	Khankulipur	0.60Km SE	25°14'35.29"N 84°39'31.84"E
SQ2	Fakharpur	5.10 Km, East	25°14'38.28"N 84°42'22.27"E
SQ3	Sahar	2.30 km, West.	25°15'25.71"N 84°37'47.63"E
SQ4	Pipra Bangla	3.10 Km, SW	25°13'25.23"N 84°37'58.31"E

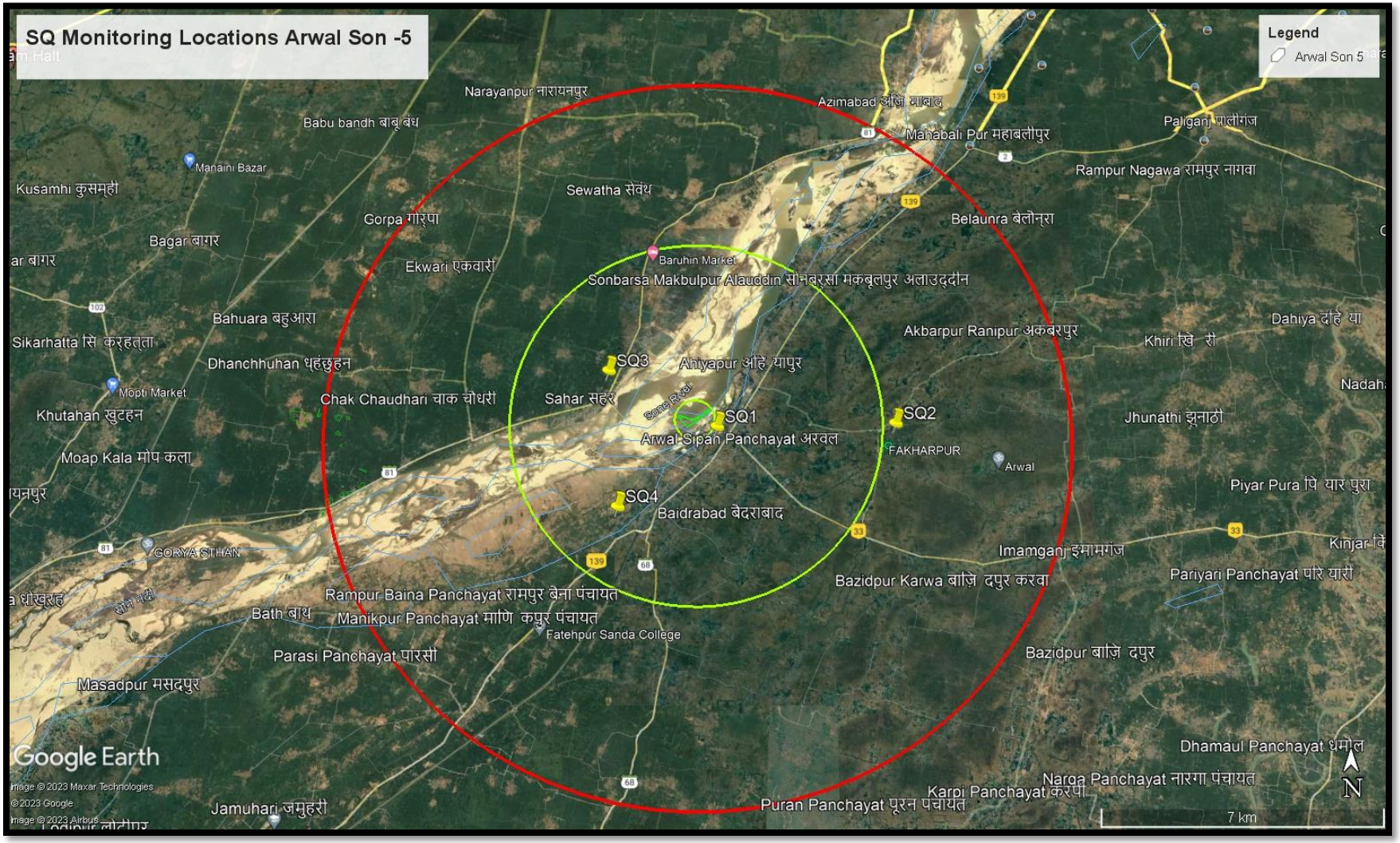


Figure 3-4 Map showing Soil Quality Monitoring Locations

Table 3-3 Soil Quality Parameters

S. No.	Parameter	Unit	SQ1	SQ2	SQ3	SQ4
1.	Texture	…	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam	Sandy Clay Loam
2.	Sand	%	65.5	60.7	52.1	55.8
3.	Silt	%	22.4	26.2	27.4	26.0
4.	Clay	%	12.1	13.1	20.5	18.2
5.	pH (1:2 Suspension)	..	7.64	8.12	7.88	7.47
6.	Sodium Absorption Ratio (SAR)*	%	1.40	1.65	1.84	1.45
7.	Electrical Conductivity (1:2)	µmho/cm	326.5	342.6	348.81	339.6
8.	Water Holding Capacity(WHC)	%	42.5	37.9	37.0	37.4
9.	Sodium (Na)	mg/kg	134.9	175.5	147.7	154.8
10.	Calcium (Ca)	mg/kg	1216.7	1196.9	1084.2	1085.2
11.	Magnesium (Mg)	mg/kg	545.9	491.3	535.5	546.12
12.	Bulk Density	g/cm3	1.32	1.28	1.56	1.47
13.	Total Nitrogen (N)	mg/kg	267.5	186.9	249.45	179.5
14.	Phosphorus (PO4)	mg/kg	54.7	54.9	60.7	43.7
15.	Potassium (K)	mg/kg	312.0	316.23	354.8	254.0
16.	Organic Matter	%	1.12	0.96	1.22	1.2
17.	Organic Carbon	%	1.38	1.65	1.46	1.81
18.	Sulphate as (SO4)	mg/kg	2.12	1.45	2.42	1.12
19.	Porosity	%	28.32	24.7	21.42	32.3
20.	Arsenic	mg/kg	<0.01	<0.01	<0.01	<0.01
21.	Fluoride	mg/kg	0.84	0.84	0.92	1.05

3.3.2 Results

Samples collected from identified locations indicate pH value ranging from 7.47 to 8.12 which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 0.96 % to 1.22% in the soil samples and, whereas the Potassium is found to be ranging from 254 mg/kg to 354.8 mg/kg.

3.4 WATER ENVIRONMENT

3.4.1 General

This section describes the prevailing water environment in the study area in terms of water resources i.e. quantitatively and qualitatively. This has been achieved by performing qualitative analysis of water samples collected from ground water source and surface water body (Son river) falling within the study area. Ground & Surface water samples are collected from locations as shown in Fig. 3.5 and Fig. 3.6 respectively. Primary objective of the study is to assess the water quality for critical parameters and evaluate its impact on habitat and aesthetics in the surrounding areas of the project. This assessment will be useful in formulating mitigation measures to minimize the impacts of the project on the surrounding environment.

3.4.2 Methodology

Perennial source of Surface water in the study area is Son River (a tributary of Ganga River) which flow from South to North direction. Samples were collected from upstream and downstream areas of the project site and third sample was also collected near the project site.

Contour and Drainage pattern are the most important factors governing the choice of sampling locations. It can be assumed that run-off from project site, if any will follow the natural drainage and contour of the landscape. Therefore, downstream areas are mostly likely to experience the impacts of the project. On this basis, two surface water and five ground water sampling locations were chosen for determining quality of water for the category of end use and for parameters as per IS:10500 -2012. Thus, it helps in predicting the entry of potential pollutant or merging tributaries acts as a source of pollution in the river which affects the quality of water. It helps in determining the extent of pollution.

Based on the above factors, sampling locations for Ground and surface water quality have been finalized and shown in Table 3.4 Figure 3.5 & Table 3.5, Figure 3.6, respectively. AIS 10500:2012 (for drinking water) has been used for analysis of the water samples for drinking purpose and for the designated use of water as per the categories of CPCB guidelines.

3.5 Groundwater

3.5.1 Ground water Potential: -

The Study area falls under Western part of the Bihar. As per CGWB report , water level varises in these areas between 2- 5 mgbl.

Most of villages in the project area have borewell and tube well facilities, as most of the residents of these villages make use of this water for agriculture and domestic purposes. Therefore, ground water sampling was done from villages within 10 km radius of the project site. Ground water sampling locations are given in Table 3.4. All Ground water samples are analyzed as per IS-10500:2012. The results of the analyzed ground water samples result are given in Table 3.4& Figure 3.5 shows Ground water sampling location on Topographic map.

Table 3-4 Ground water monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
GW1	Near Project Site, Sipah Panchayat	0.45 Km, SE	25°14'43.10"N 84°39'28.26"E
GW2	Sakri High School, Sakri	3.90 Km, NNE	25°16'34.72"N 84°40'46.99"E
GW3	Government Middle School, Bansidih	3.55 Km, NW	25°16'36.59"N 84°38'22.96"E
GW4	Pipra Bangla	3.15 Km, SW	25°13'16.82"N 84°38'10.38"E
GW5	Surya Mandir, Motha	3.25 Km SE	25°13'43.71"N 84°40'46.42"E

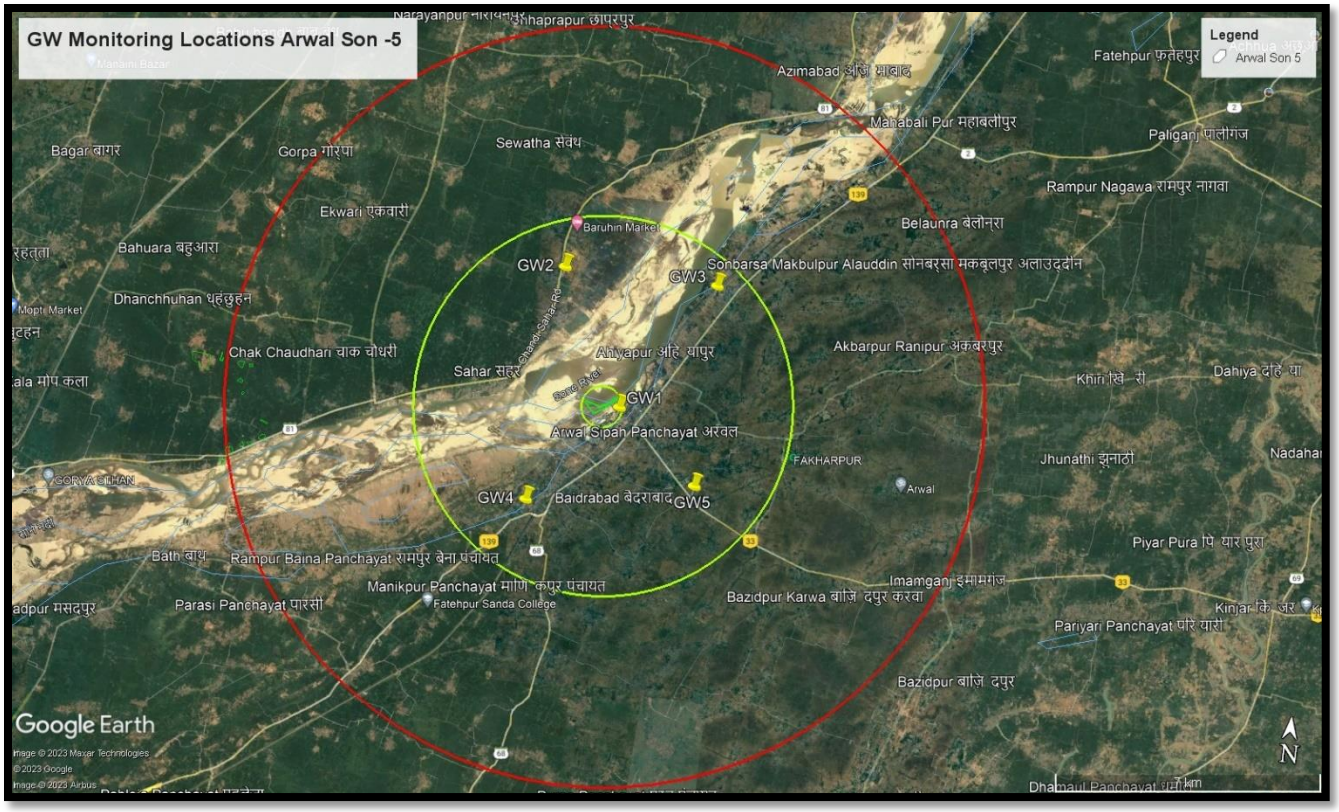


Figure 3-5 Map showing Ground Water Monitoring Locations

Table 3-5 Ground water quality results

S N.	Parameter	Test Method	Drinking Water Standards / Limit (IS:10500 2012)		GWQ 1	GWQ 2	GWQ 3	GWQ 4	GWQ 5
			Desirable	Permissible					
1	Colour	IS:3025 (Pt-4)	5	15	<5.0	<5.0	<5.0	<5.0	<5.0
2	Odour	IS:3025 (Pt-5)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Pt-11)	6.5 - 8.5	No Relaxation	7.40	7.71	7.12	7.52	7.16
4	Taste	IS:3025 (Pt-8)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable
5	Turbidity	IS:3025 (Pt-10)	1	5	<1.0	<1.0	<1.0	<1.0	<1.0
6	Total Dissolv	IS:3025 (Pt-16)	500	2000	470.7	360.78	225.6	384.7	567.5

	e Solid (TDS)								
7	Total Alkalinity (CaCO3)	IS:3025 (Pt-23)	200	600	190.2	137.76	185.1	188.8	185.07
8	TotalHardness (CaCO3)	IS:3025 (Pt-21)	200	600	201.6	180.71	212.7	220.6	278.5
9	Chloride (Cl)	IS:3025 (Pt-32)	250	1000	78.3	92.51	106.9	81.7	138.9
10	Calcium (Ca)	IS:3025 (Pt-40)	75	200	48.7	76.65	53.3	45.09	89.8
11	Mineral Oil	IS:3025 (Pt-39)	0.5	No Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
12	Sulphate (SO4)	IS:3025 (Pt-24)	200	400	12.3	23.45	31.0	26.3	29.3
13	Nitrate (NO3)	IS:3025 (Pt-34)	45	No Relaxation	2.2	1.64	3.5	4.2	2.72
14	Fluoride (F)	IS:3025 (Pt-60)	1	1.5	0.26	0.06	0.09	0.45	0.40
15	Iron (Fe)	IS:3025 (Pt-53)	0.3	No Relaxation	0.14	0.18	0.19	0.16	0.16
16	Aluminium (Al)	APHA-3500 (B)	0.03	0.2	<0.02	<0.02	<0.02	<0.02	<0.02
17	Selenium (Se)	APHA-3113 (B)	0.01	No. Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
18	Cyanide (Cn)	APHA-4500 (C)	0.05	No. Relaxation	N.D	N.D	N.D	N.D	N.D
19	Copper (Cu)	APHA-3111(B)	0.05	1.5	<0.04	<0.04	<0.04	<0.04	<0.04
20	Magnesium (Mg)	IS:3025 (Pt-45)	30	100	21.4	18.48	16.5	28.6	18.2
21	Manganese(Mn)	APHA-3111(B)	0.1	0.3	<0.1	<0.1	<0.1	<0.1	<0.1

22	Zinc(Zn)	APHA-3111 (B)	5	15	0.27	0.14	0.25	0.38	0.36
23	Cadmium(Cd)	APHA-3111 (B)	0.003	No. Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001
24	Lead(Pb)	APHA-3111 (B)	0.01	No. Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
25	Mercury(Hg)	APHA-3112 (B)	0.001	No. Relaxation	<0.001	<0.001	<0.001	<0.001	<0.001
26	Nickel (Ni)	APHA-3111 (B)	0.02	No. Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
27	Arsenic (As)	APHA-3500 (B)	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
28	Chromium (Cr+6)	APHA-3500 Cr-B	0.05	No. Relaxation	<0.01	<0.01	<0.01	<0.01	<0.01
29	Phenolic Compound (C_6H_5OH)	APHA-5530	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
30	Conductivity (25 °C)	APHA-2510	Not Specified	Not Specified	553.2	524.69	394.2	478.8	714.2
31	E. Coli	IS:1622-1981	Shall Not Be Detectable	---	Absent	Absent	Absent	Absent	Absent
32	Total Coliform	IS:1622-1981	Shall Not Be Detectable	---	Absent	Absent	Absent	Absent	Absent

3.6 Result& conclusion

The examination of the physicochemical analysis of the ground water shows that the quality of ground water is generally good with respect to the limits laid down in Bureau of India Standards (IS: 10500:2012) for drinking water. Based on the above result it is concluded that the ground water samples are fit for drinking purpose.

3.6.1 Surface water

The surface water parameters have been analyzed as per APHA procedure and compared with CPCB water quality criteria mentioned in Table 3.6 and the Surface water sample results are mentioned in Table-3.8.

Table 3-6 Water Quality Criteria as per Central Pollution Control Board

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less; pH between 6 to 9; Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less

Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

Table 3-7 Surface water monitoring locations

S. No.	Name	Distance & Direction from project site	Co-ordinates
SW1	Sone River (downstream)	1.80 km, NE	25°15'46.22"N 84°40'5.85"E
SW2	Sone River (Upstream)	3.80 km, WNW	25°14'39.42"N 84°36'41.67"E
SW3	Canal	5.10 km, ESE	25°13'20.55"N 84°41'49.84"E
SW4	Canal Near, Baidrabad	2.45 km, SW	25°13'32.09"N 84°38'35.83"E

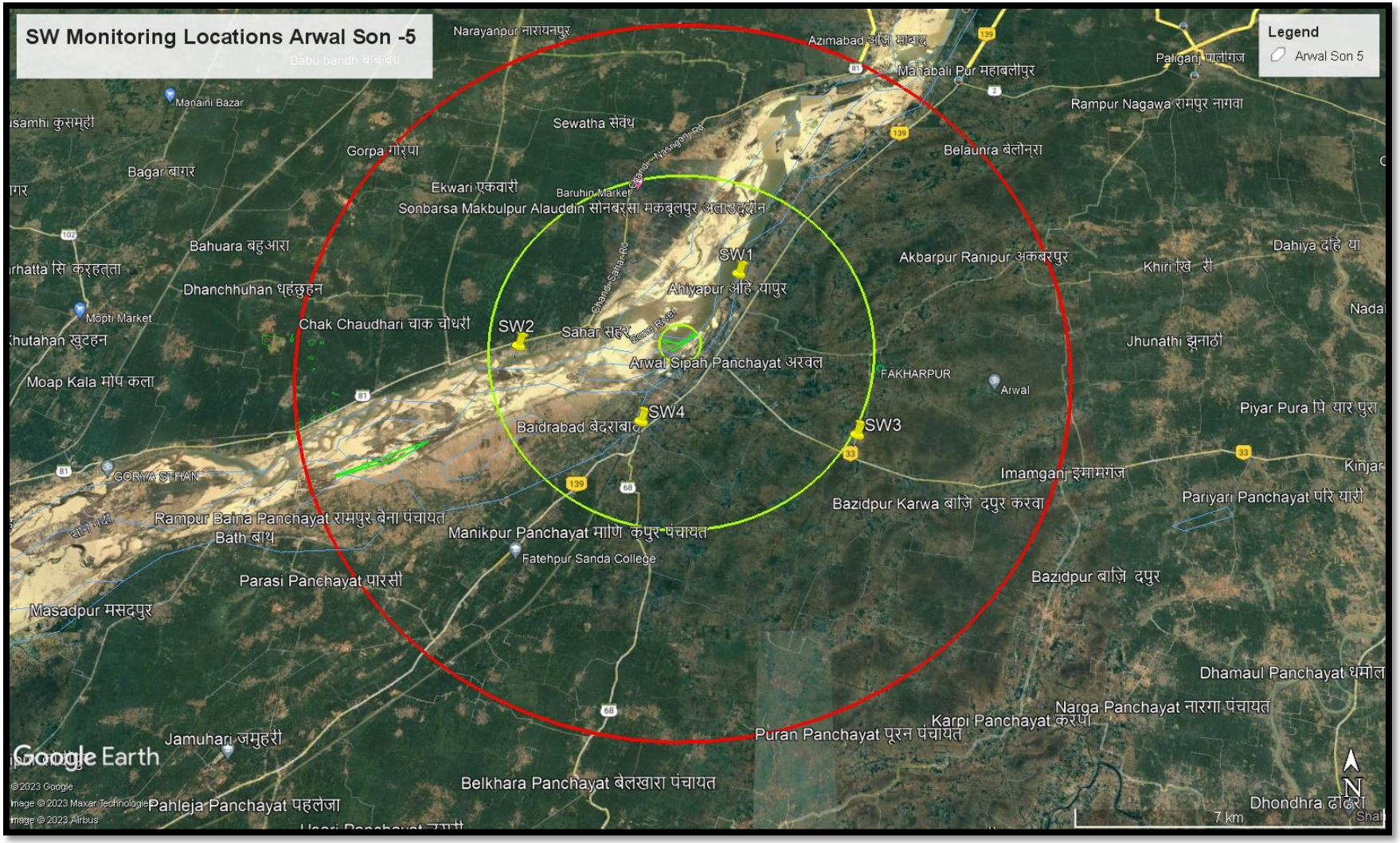


Figure 3-6 Map showing Surface Water Monitoring Locations

Table 3-8 Surface Water Results

Sr N.	Parameter	Test Method	Unit	SWQ1	SWQ2	SWQ3	SWQ4
1	Colour	IS:3025 (Pt-4)	Hazen	<5.0	<5.0	<5.0	<5.0
2	Odour	IS:3025 (Pt-5)	---	Agreeable	Agreeable	Agreeable	Agreeable
3	pH	IS:3025 (Pt-11)	---	7.78	7.48	7.38	6.55
4	Turbidity	IS:3025 (Pt-10)	NTU	14.14	9.86	11.9	9.45
5	Total Dissolve Solid (TDS)	IS:3025 (Pt-16)	mg/L	462.4	489.7	388.1	427.7
6	Total Alkalinity (CaCO3)	IS:3025 (Pt-23)	mg/L	189.1	192.1	189.4	173.5
7	Total Hardness(CaCO3)	IS:3025 (Pt-21)	mg/L	239.1	275.7	250.3	137.8
8	Chloride (Cl)	IS:3025 (Pt-32)	mg/L	115.7	101.8	75.2	88.42
9	Calcium (Ca)	IS:3025 (Pt-40)	mg/L	66.5	49.9	55.3	42.7
10	Mineral Oil	IS:3025 (Pt-39)	mg/L	<0.01	<0.01	<0.01	<0.01
11	Sulphate (SO4)	IS:3025 (Pt-24)	mg/L	45.5	34.9	39.07	28.9
12	Nitrate (NO3)	IS:3025 (Pt-34)	mg/L	3.4	5.8	3.42	1.23
13	Fluoride (F)	IS:3025 (Pt-60)	mg/L	0.42	0.34	0.45	0.37
14	Iron (Fe)	IS:3025 (Pt-53)	mg/L	0.21	0.22	0.22	0.12
15	Aluminium (Al)	APHA-3500 (B)	mg/L	<0.01	<0.01	<0.01	<0.01
16	Selenium (Se)	APHA-3113 (B)	mg/L	<0.01	<0.01	<0.01	<0.01
17	Cyanide (Cn)	APHA-4500	mg/L	<0.02	<0.02	<0.02	<0.02

		(C)					
18	Copper(Cu)	APHA-3111(B)	mg/L	<0.05	<0.05	<0.05	<0.05
19	Magnesium (Mg)	IS:3025 (Pt-45)	mg/L	17.2	19.7	9.16	13.8
20	Manganese(Mn)	APHA-3111(B)	mg/L	<0.1	<0.1	<0.1	<0.1
21	Zinc(Zn)	APHA-3111 (B)	mg/L	0.66	0.46	0.48	0.46
22	Cadmium(Cd)	APHA-3111 (B)	mg/L	<0.001	<0.001	<0.001	<0.001
23	Lead(Pb)	APHA-3111 (B)	mg/L	<0.01	<0.01	<0.01	<0.01
24	Boron	IS:3026(Pt-57)	Mg/L	<0.05	<0.05	<0.05	<0.05
25	Mercury(Hg)	APHA-3112 (B)	mg/L	<0.001	<0.001	<0.001	<0.001
26	Molybdenum(mo)	IS:3025(Pt-2)	mg/L	<0.05	<0.05	<0.05	<0.05
27	Nickel (Ni)	APHA-3111 (B)	mg/L	<0.01	<0.01	<0.01	<0.01
28	Arsenic(As)	APHA-3500 (B)	mg/L	<0.01	<0.01	<0.01	<0.01
29	Chromium (Cr+6)	APHA-3500 Cr-B	mg/L	<0.01	<0.01	<0.01	<0.01
30	Conductivity (25 °C)	APHA-2510	µs/Cm	694.2	710.5	612.2	585.9
31	Chemical Oxygen Demand (COD)	APHA-5220 (B)	mg/L	16.5	18.7	21.4	19.9
32	Biological Oxygen Demand (BOD at 27OC for 3 day)	APHA-4500 (D)	mg/L	3.6	4.2	6.0	4.6
33	Dissolve Oxygen (DO)	APHA-5210	mg/L	5.5	7.6	4.7	3.8
34	E. Coli	IS:1622-1981	MPN/100ml	480.0	190.0	260.0	230.0
35	Total Coliform	IS:1622-1981	MPN/100ml	670.0	230.0	480.0	380.0

The river water quality parameters are compared with BDU Criteria of CPCB. No metal contamination has been found in surface water samples. Overall, the surface water quality of river is meeting the Class D of DBU Criteria of CPCB for its suitability for wild life and fisheries.

3.7 AIR ENVIRONMENT

3.7.1 General

This section describes the prevailing air environment in the study area for evaluating the impacts of mining activity in surrounding areas. This has been achieved by determining the ambient air quality within the study area, represented by 10 km radius area around the project site, as shown in Figure 3.7. 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_{10} & $PM_{2.5}$ twice a week at each station. This study was done during winter season for a period of 3 months from 7th Dec 2022 to 5th March 2023.The analysis reports are appended below in the Table-3.11.

Table 3-9 Site-specific meteorological data

Months	Relative Humidity, %	Rainfall, mm	Mean Wind Speed, m/sec	Wind Directions (blowing from)	Avrg Temperature (degree Celsius)
December	50%	8	2.8	South West	18
January	36%	8	2.1	West	16
February	30%	6	1.9	West	20

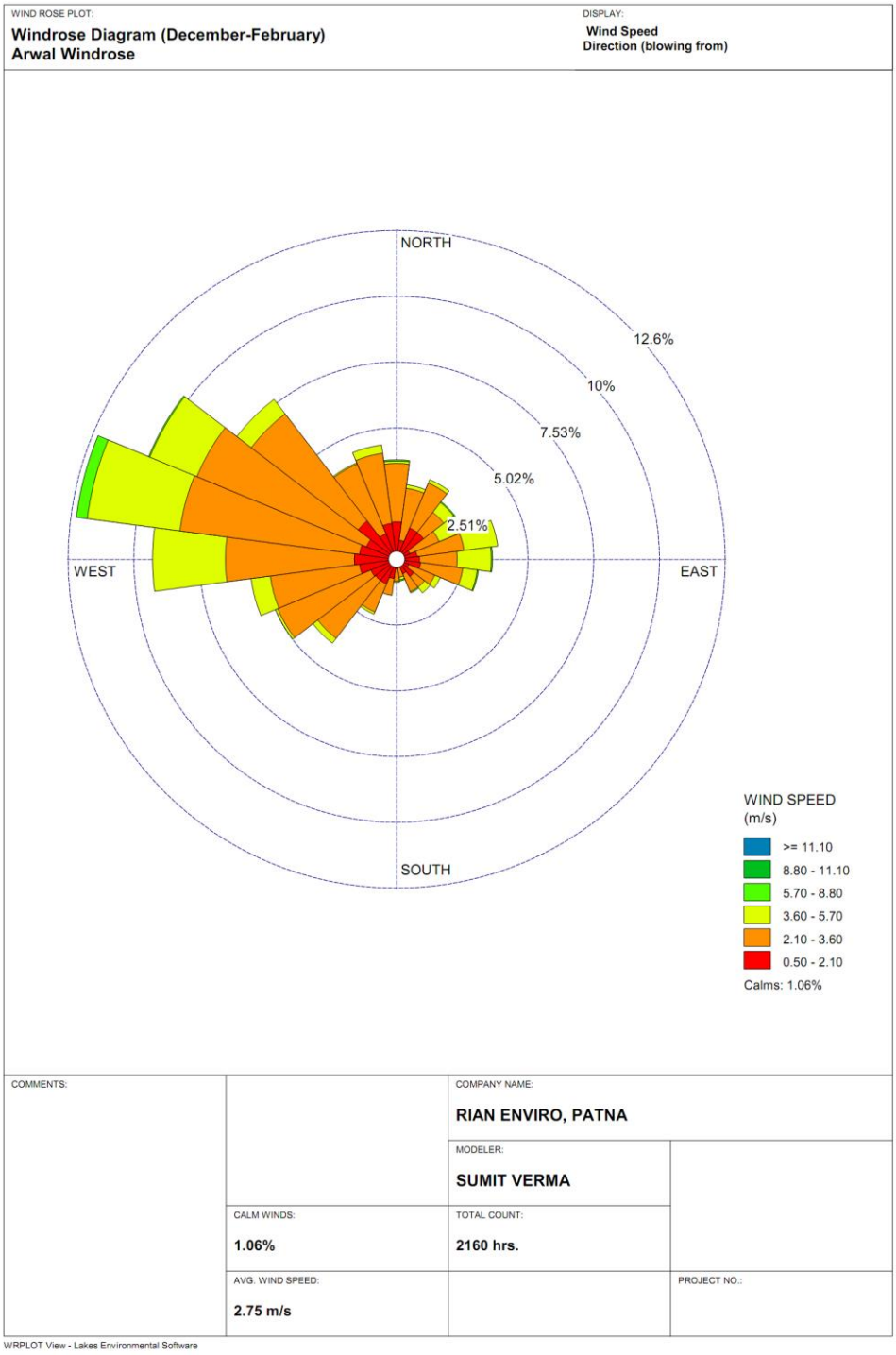


Figure 3-7 Wind Rose Pattern

Observation:

The prominent seasonal wind direction is WNW, with average wind speed 2.75m/s

3.7.2 Methodology

The choice of monitoring locations for ambient air quality is based on:

1. Meteorology of the area: From the meteorological data the frequency and duration of wind is preliminary determined, from which the wind rose diagram is first drawn. Eight monitoring stations have been selected to assess the Air quality in study area.
2. The location of nearest human habitation is also considered for selecting the location of air quality monitoring station. The quality of air at this location is important to know the impact of the proposed mining activities .in terms of emission of particulate matter and gaseous emissions.
3. It is equally important to know the accessibility to the selected air quality stations. Therefore, the availability of roads along with electricity also plays an important role in finalizing the ambient air quality monitoring locations.

Based on these factors, seven monitoring locations were identified as shown in Table 3.10 and Figure 3.9. CPCB guidelines for the measurement of ambient air quality on 24 hourly monitoring was carried out for SO_2, NO_2, $PM_{2.5}$ & PM_{10} twice a week at each station for a study period of 3 months (7^{th} December 2022 to 5^{th} March 2023).

Table 3-10 Ambient Air monitoring locations

S.No	Name	Distance & Direction from project site	Co-ordinates
AAQ1	Khankulipur	0.53 Km, SE	25°14'38.57"N 84°39'29.38"E
AAQ2	Nanaur	6.20 Km North	25°18'20.58"N 84°39'38.61"E
AAQ3	Sahar	2.20 km, West.	25°15'8.32"N 84°37'42.23"E
AAQ4	Fakharpur	5.10 Km, East	25°14'26.92"N 84°42'17.82"E
AAQ5	Ahiyapur	1.90 Km, NE	25°15'38.04"N 84°40'19.17"E
AAQ6	Bishunpura	5.10 Km, NW	25°17'26.78"N 84°38'15.60"E
AAQ7	Pipra Bangla	3.10 Km, SW	25°13'23.44"N

			84°38'6.47"E
AAQ8	Perhap	7.05 Km, west	25°15'21.03"N 84°34'49.14"E

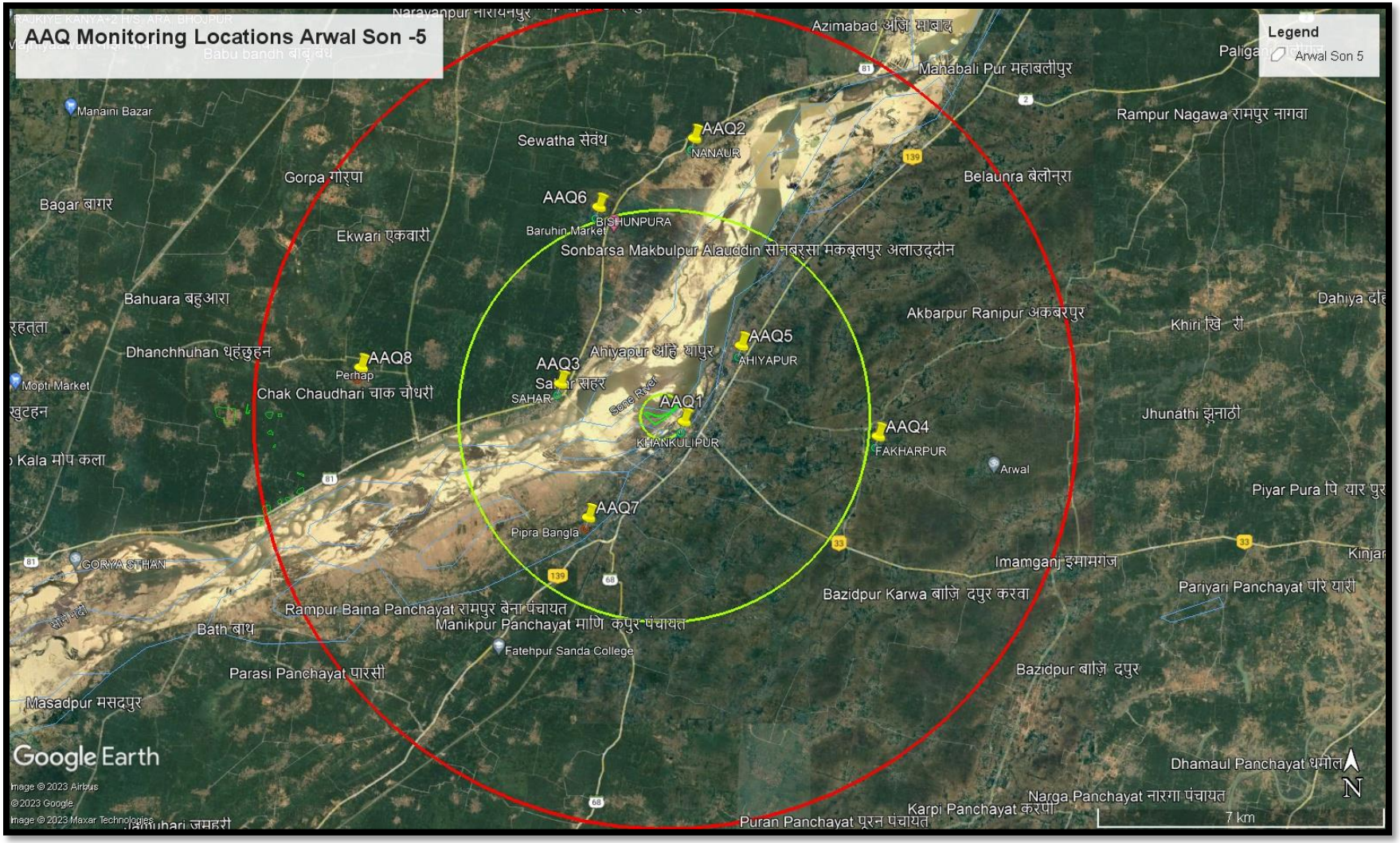


Figure 3-8 Map showing Ambient Air Quality Monitoring Locations

Table 3-11 Ambient Air Quality Monitoring Results

Parameter	$PM_{2.5}(\mu g/m^3)$	$PM_{10}(\mu g/m^3)$	$SO_2(\mu g/m^3)$	$NO2(\mu g/m^3)$
AAQM Norms	60	100	80	80
Khankulipur (AQ1)				
MIN	56.0	28.4	9.0	13.8
MAX	71.5	37.7	14.5	22.5
AVG	62.6	32.1	12.2	17.7
98 Percentile	71.0	37.1	14.4	21.7
Village Nanaur (AQ2)				
MIN	56.7	27.4	8.9	13.0
MAX	73.8	41.6	14.8	23.3
AVG	63.2	33.2	11.2	17.6
98 Percentile	71.7	40.3	14.5	23.1
Village Sahar (AQ3)				
MIN	55.6	26.7	9.1	16.2
MAX	74.1	39.3	14.7	24.7
AVG	63.3	32.5	11.2	20.3
98 Percentile	73.0	37.4	14.2	24.4
Village Fakharpur (AQ4)				
MIN	58.6	33.1	8.6	13.9
MAX	69.2	39.4	16.1	24.3
AVG	64.4	36.4	12.8	17.9
98 Percentile	69.0	39.3	16.1	23.0
Village Ahiyapur (AQ5)				
MIN	59.5	33.9	6.9	18.3
MAX	70.6	41.7	13.7	28.6
AVG	64.6	38.8	11.4	22.4
98 Percentile	70.0	41.5	13.7	27.5
Village Bishunpura (AQ6)				
MIN	49.5	26.3	8.4	19.4
MAX	66.3	36.1	18.5	30.0
AVG	58.8	30.9	13.4	23.9
98 Percentile	66.0	35.7	18.4	29.7
Village Pipra Bangla (AQ7)				
MIN	58.0	33.9	10.0	16.4
MAX	74.7	68.6	18.3	31.7
AVG	66.0	38.9	12.1	22.4
98 Percentile	74.1	56.4	17.2	30.0
Village PERHAP (AQ8)				
MIN	59.5	34.4	9.7	16.0

MAX	76.7	43.1	17.9	30.9
AVG	67.8	38.4	11.8	21.8
98 Percentile	76.1	42.4	16.8	29.2

CO	AQ1	AQ2	AQ3	AQ4	AQ5	AQ6	AQ7	AQ8
Minimum	0.34	0.32	0.29	0.27	0.38	0.27	0.32	0.25
Maximum	0.83	0.80	0.76	0.82	0.84	0.77	0.82	0.76

3.7.3 Results

The ambient air quality study for the 8 AAQ monitoring stations shows that the maximum and minimum ground level concentration for PM_{10} is respectively 76.7 µg/m^3 at AQ8 and 49.5 µg/m^3at AQ6. Whereas the maximum and minimum ground level concentration for $PM_{2.5}$ ranges between 43.1 µg/m^3 at AQ5 and 26.7 µg/m^3 at AQ3 respectively. Similarly, for SO_2, the maximum and minimum ground level concentration varies between 18.5 µg/m^3 and 8.6 µg/m^3 for respectively AQ6 and AQ4 stations. For NO_2 the maximum and minimum ground level concentration varies between 31.7/m^3&13.0 µg/$m^3$for respectively AQ7 and AQ2 stations.

3.8 NOISE ENVIRONMENT

3.8.1 General

The ambient noise levels within the study area were recorded using Sound Level Meter. Noise level monitoring results were compared with the Ambient Noise Quality Standard notified under Environment Protection Act, 1986 and amended thereof.

3.8.2 Methodology

The proposed project activity is expected to affect ambient noise quality in the surrounding areas only by the movement of sand excavation and sand carrying vehicles. Therefore, the choice of monitoring locations is based on human habitation factors. Table 3.12 and Figure 3.9 shows noise quality monitoring locations.

Table 3-12 Noise Quality Monitoring Stations

S.No	Name	Distance & Direction from project site	Co-ordinates
NQ1	Near Project Site, Sipah Panchayat	0.45 Km, SE	25°14'39.81"N 84°39'27.31"E
NQ2	Sipah Panchayat	0.40Km South	25°14'35.06"N 84°39'15.58"E

NQ3	Vill- Abgilla	2.30 Km West	25°15'6.64"N 84°37'41.18"E
NQ4	Vill- Rampur on Road	4.10 Km SE	25°14'40.98"N 84°41'38.74"E
NQ5	Sakri High School, Sakri	3.90 Km, NNE	25°16'34.72"N 84°40'46.99"E
NQ6	Government Middle School, Bansidih	3.55 Km, NW	25°16'36.59"N 84°38'22.96"E
NQ7	NH 139, Near Pipra Bangla	3.15 Km SW	25°13'14.54"N 84°38'16.93"E
NQ8	Vill- Payare chak	4.0 Km, SE	25°12'49.65"N 84°40'1.84"E

Table 3-13 Noise Level Status

S. No.	Locations		Equivalent Noise Level, dB (A)			
			Limit (as per CPCB Guidelines),Leq, dB(A)		Observed value Leq, dB(A)	
			DAY*	NIGHT*	DAY*	NIGHT*
1	Near Project Site, Sipah Panchayat	Residential Zone	55	45	52.4	40.2
2	Sipah Panchayat	Residential Zone	55	45	48.7	36.2
3	Vill- Abgilla	Residential Zone	55	45	48.1	37.8
4	Vill- Rampur on Road	Residential Zone	55	45	47.2	35.5
5	Sakri High School, Sakri	SILENCE ZONE	50	40	48.4	36.1
6	Government Middle School, Bansidih	SILENCE ZONE	50	40	46.5	35.3
7	NH 139, Near Pipra Bangla	Residential Zone	55	45	53.1	41.3
8	Vill-Payare Chak	Residential Zone	55	45	48.4	33.8

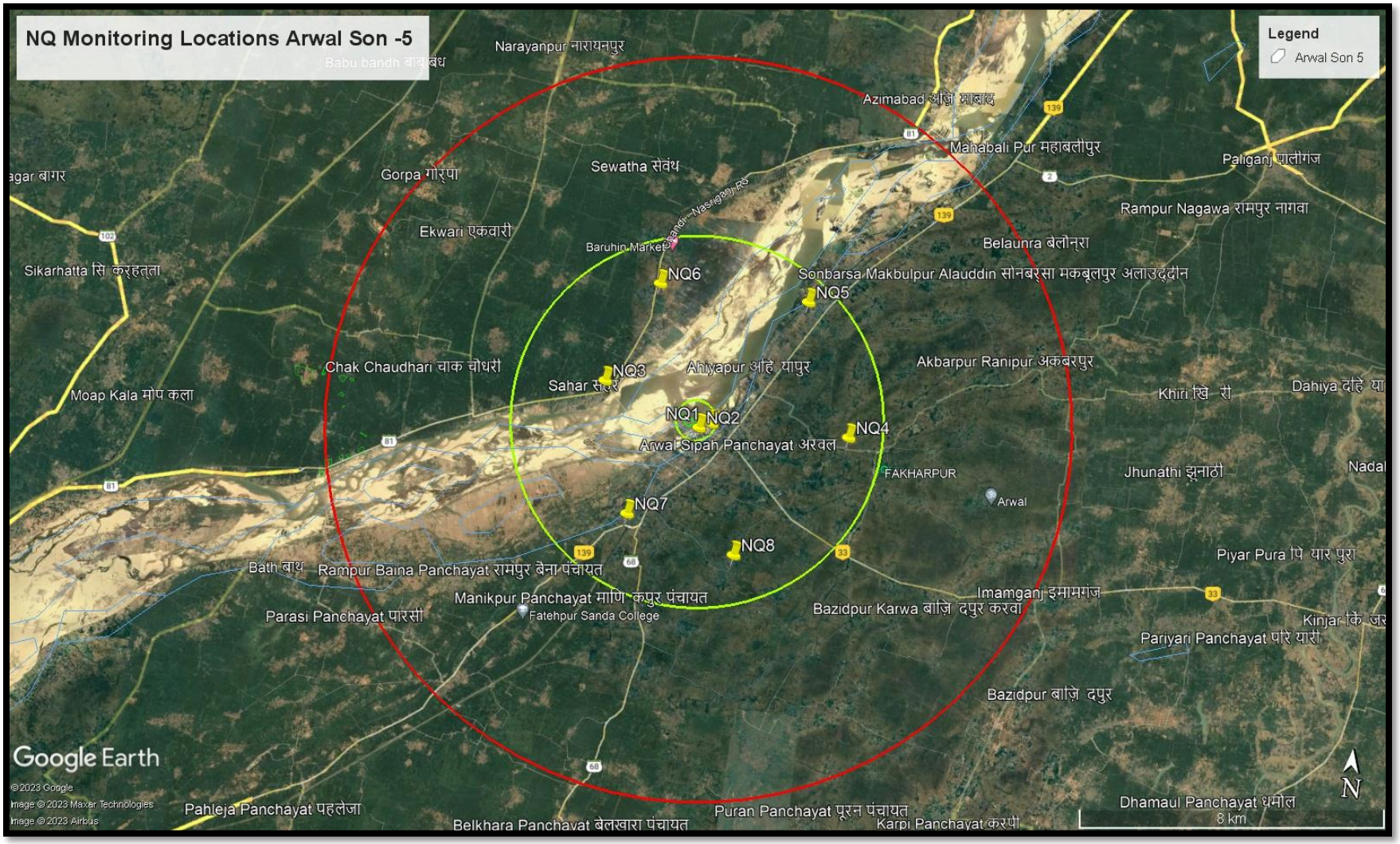


Figure 3-9 Map showing Noise Quality Monitoring Locations

3.9 Results

Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 46.5 dB (A) at NQ6 & 53.1 dB (A) at NQ7. The minimum & maximum noise levels at night time were found to be 33.8 dB (A) at NQ8 & 41.3 dB (A) at NQ7.

There are no other major noise producing sources in the study area except some domestic activities, which contributes to the local noise level of the area. Traffic movements in nearby villages also add to the ambient noise level of the area.

3.10 BIOLOGICAL ENVIRONMENT

3.10.1 INTRODUCTION:

The biological environment is very crucial for living environment of any area. The Biological diversity includes the variation of all of life forms mainly genetic, species and population. However, Flora and Fauna diversity is broadly understood type. They are further divided in to terrestrial and aquatic life form. Forests are repository of the bio-diversity, gene pool resources, sequester carbon dioxide and provide lot of other environmental services. They play a very vital role in sustaining the life of people and are crucial for the food and water security. In India, the sustained flow of water in our rivers, streams and rivulets and recharge of ground water is necessary for the food security and drinking water availability. The hydrological functions of forests include interception of rainfall and regulating the stem flows, binding soil to prevent soil erosion and conserving the soil moisture. The Forests are the source of major water resource both surface, subsoil and ground water in the country. Forests supply nutrients to agriculture crops through runoff water with much other complementariness with agriculture ecosystem. The division of core and buffer zone is the best way to study the pattern of biodiversity for environmental impact assessment.

3.10.2 RESULTS AND DISCUSSION

The primary survey of study area was conducted particularly with reference to habitat types, listing of species and assessment of the existing baseline ecological (terrestrial and aquatic ecosystem) conditions.

National Park, Wildlife Sanctuary, Notified Forest, Ecologically Sensitive area and critically polluted areas in study area:

There is no national park, wildlife sanctuary and critically polluted area in 10km radius from the project site. There are no forests within 15 Km from the boundary of the project site. The area harbours one of the best alluvial soils in India.

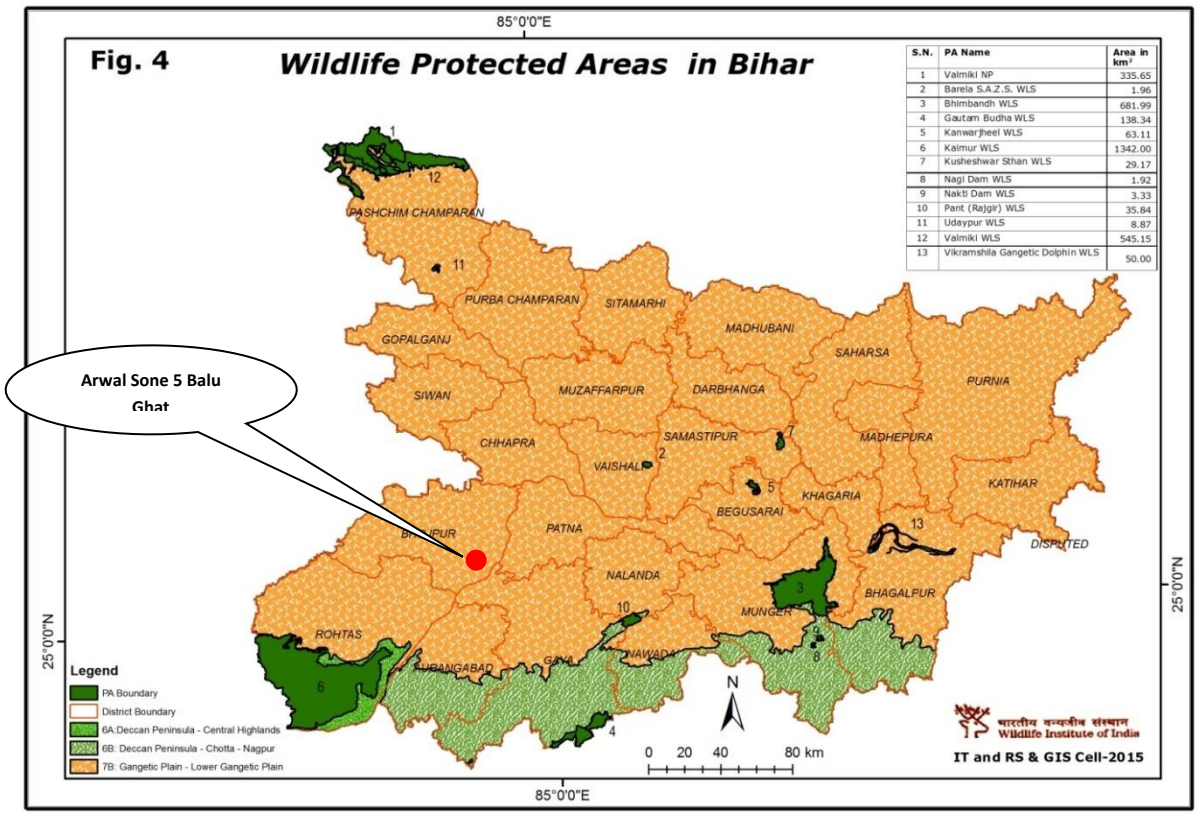


Figure 3-10 Wildlife Protected area of Bihar

3.11 Floral biodiversity:

Core Zone: The core zone was devoid of any plant or tree naturally growing over there. The agro-biodiversity of the study area is unique and there is no reserve or protected forest. The core zone is a long stretch of river sand and no flora was found in the core zone

Buffer Zone: Some of the most dominant species in not forest area are babool (*Vachellia nilotica*), vilayati babool (*Prosopis juliflora*), neem (*Azadirachta indica*), gulmohar (*Delonix regia*.), amaltas (*Cassia fistula*), dhatura (*Datura stramonium*), arandi (*Ricinus communis*), ber (*Ziziphusjujube*), bougainvellia (*Bougainvillea spectabilis*), peepal (*Ficusreligiosa*), shisham (*Dalbergiasissoo*), sagwan (*Tectona grandis L.f.)* etc. were observed within 10km radius of the study area. Predominant plant vegetation is Dalbergia shisoo, Acacia catechu, Borassus flaberiformis and Bombax ceiba respectively. The other plant is Acacia nilotica, Acacia sp, Azadirachta indica, Eucalyptus, Dhatura sp, Zizyphus sp, Cassia tora, Dalbergia sisoo, Parthenium sp, Cassia sp.

The important floras of the study area are given in **Table 3.14, 3.15, 3.16**

Table 3-14 Flora (Trees) of the Study Area

Sr. No.	Local Names	English Name	Botanical Names	Family	Uses
1	Babool	Babool	*Vachellia nilotica* (L.) P.J.H.Hurter & Mabb.	Fabaceae	Produces Gum Arabic, tender twigs are used as tooth brush, good source of timber and fodder.
2	Vilayati Babool	Mesquite tree	*Prosopis juliflora* (Sw.) DC.	Fabaceae	Used as fodder and fuel wood.
3	Neem	Indian Lilac	*Azadirachta indica* A.Juss.	Meliaceae	Multipurpose tree
4	Dhatura	Locoweed	*Datura stramonium* L.	Solanaceae	Widely used in traditional medicine
5	Ber	Indian date	*Ziziphus jujube* Mill.	Rhamnaceae	Fruits are eaten and have medicinal value
6	Peepal	Sacred fig	*Ficus religiosa* L.	Moraceae	Religious &Multipurpose tree
7	Amaltas	Golden shower tree	*Cassia fistula* L.	Fabaceae	Ornamental Plant
8	Sagwan	Teak	*Tectona grandis L.f.*	Lamiaceae	Timber plant
9	Sahjan	Drum stick	Moringa oleifera Lam.	Moringaceae	Its young seed pods and leaves are used as

Sr. No.	Local Names	English Name	Botanical Names	Family	Uses
					vegetables. It can also be used for water purification and hand washing, and is sometimes used in herbal medicine.
10	Gulmohar	Flamboyant	*Delonix regia* (Boj. ex Hook.) Raf.	Fabaceae	Ornamental Plant
11	Arjun	Arjun Tree	*Terminalia arjuna* (Roxb.) Wight &Arn.	Combretaceae	Leaves are used for silk worms and have medicinal uses
12	Mahua	Indian butter tree	*Madhuca longifolia* (J.Konig) J.F.Macbr.	Sapotaceae	It is used as an oil and alcoholic drink, Flowers are edible, pressed cake are used killing fishes in aqua culture pond.
13	Aam	Mango	Mangifera indica L.	Anacardiaceae	Multipurpose tree
14	Kathal	Jackfruit	*Artocarpus heterophyllus Lam.*	Moraceae	Multipurpose tree
15	Imli	Tamarind	*Tamarindus indica* L.	Fabaceae	Multipurpose tree
16	Bel	Bengal quince	*Aegle marmelos*	Rutaceae	Religious & Multipurpose

Sr. No.	Local Names	English Name	Botanical Names	Family	Uses
			(L.) Corrêa		tree
17	Kela	Banana	*Musa acuminata* Colla	Musaceae	Fruit is eaten
18	Anar	Pomegranate	*Punica granatum* L.	Lythraceae	Fruit is eaten
19	Amrud	Guava	*Psidium guajava* L.	Myrtaceae	Fruit is eaten
20	Singri	Monkeypod	*Pithecellobium dulce* (Roxb.) Benth	Fabaceae	Medicinal and ornamental tree
21	Jamun	black plum	*Syzygium cumini* (L.) Skeels	Myrtaceae	Multipurpose tree
22	Sisham	North Indian rosewood	*Dalbergia sissoo* Roxb	Fabaceae	Best known economic timber species

Table 3-15 Flora (Shrubs) of the Study Area

Sr. No.	Local Names	English Name	Botanical Names	Family
1	Raat rani	lady of the night	*Cestrum nocturnum* L.	Solanaceae
2	Gurhal	China rose	*Hibiscus rosa-sinensis* L.	Malvaceae
3	Candle Bush	Candle Bush	*Senna alata* (L.) Roxb.	Fabaceae
4	Nayantara	Rosy periwinkle	*Catharanthus roseus* (L.) G.Don	Apocynaceae
5	Henna	mignonette tree	*Lawsonia inermis* L.	Lythraceae
6	Juhi	jasmine	*Jasminum auriculatum* Vahl	Oleaceae

Sr. No.	Local Names	English Name	Botanical Names	Family
8	Madar	king's crown	*Calotropis procera* (Aiton) W.T.Aiton	Apocynaceae
9	Nirgundi	five-leaved chaste tree	*Vitex negundo* L	Lamiaceae
10	Kurri	West Indian lantana	*Lantana camara* L	Verbenaceae

Table 3-16 Flora (Herbs) of the Study Area

Sr. No.	Local Names	English Name	Botanical Names	Family
1	Ghritakumari	Aloe vera	*Aloe vera* (L.) Burm.f.	Xanthorrhoeaceae
2	Tulsi	Holy Basil	*Ocimum tenuiflorum*L.	Lamiaceae
3	Makai	Black Cumin	*Nigella sativa* L.	Ranunculaceae
4	Satawari		*Asparagus racemosus* Willd.	Asparagaceae
5	Latjira	chaff-flower	*Achyranthes aspera* L	Amaranthaceae
6	Garundi	sessile joyweed	*Alternanthera sessilis* (L.) R.Br. ex DC	Amaranthaceae
7	Peeli kantili	Mexican prickly poppy	*Argemone mexicana* L	Papaveraceae
9	Kantakari	yellow-fruit nightshade	*Solanum virginianum* L	Solanaceae
10	Gajar Ghas	Congress grass	*Parthenium hysterophorus* L	Asteraceae
11	Sahadeva	Queensland hemp	*Sida rhombifolia* L	Malvaceae
12	Ghamra	tridax daisy	*Tridax procumbens* L	Asteraceae

Sr. No.	Local Names	English Name	Botanical Names	Family
13	Dub	Bermuda grass	*Cynodon dactylon*(L.) Pers)	Poaceae
14	Kumrya ghas	Black Speargrass	*Heteropogon contortus*(L.) P.Beauv. ex Roem. & Schult	POACEAE

Source :(i) * Field Observation and discussion with local people in Study Area,

3.11.1 Faunal Biodiversity:

The fauna visiting core zone includes monkeys (*Prebytis entellus*), snakes (*Trimeresurus gramineas*, *Dryophis nasutus*), rabbits (*Lepus nigricollis*), fish (*Catla catla*, *Labeo rohita* etc), crows (*Corvus splendens*) etc. As per the information collected by the field team, the common animals of the study area are toad (*Duttaphrynus melanostictus*) and frog (*Hoplobatrachus tigerinus*), Indian garden lizards (*Calotes versicolor*), House lizards (*Hemidactylus frenatus*). In addition, the commonly found domestic animals such as cow, dog, cat etc. and lower life forms, such as, ants, spider, butterfly, bee, wasp, and termite are also found in the study area. The common birds inhabiting in the study area are Bulbul (*Pycnonotus jocosus*), Pigeon (*Columba livia*), and Koel (*Eudynamys scolopaceus*). Table 3.15 gives a list of fauna in the study area.

Table 3-17 Fauna of the Study Area

S.No.	Common Names	Scientific Name	Wildlife Schedule
Amphibians			
1	Common Indian toad	*Rana hexadactyla*	Schedule-IV
2	Frog	*Rana tigrina*	Schedule-IV
Reptiles			
1	Indian garden lizards	*Calotes versicolor* Daudin	Schedule-IV

S.No.	Common Names	Scientific Name	Wildlife Schedule
2	House Lizards	*Hemidactylus frenatus* Schlegel	Schedule-IV
3	Rat snake	*Ptyas mucosus*	Schedule II: Part -II
Mammals			
1	Indian palm squirrel	*Funambulus pennantii* Wroughton	Schedule-IV
2	Jackal	*Canis aureus*	Schedule II
3	Monkeys	*Simia entellus* Dufresne	Schedule-II
4	Rabbits	*Lepus nigricollis* F. Cuvier	Schedule-IV
5	Rat	*Rattus rattus* Linnaeus	Schedule-V
6	Mouse	*Mus booduga* Gray	Schedule-V
Aves			
1	Crow	*Corvus splendens* Vieillot	Schedule-V
2	Sparrow	*Passer domesticus* Linnaeus	Schedule-IV
3	Baya	*Ploceus philippinus* Linnaeus	Schedule-IV
4	Parrot	*Psittacula krameri* Scopoli	Schedule-IV
5	Pigeon	*Columba livia* Gmelin	Schedule-IV
6	Myna	*Acridotheres ginginianus* Latham	Schedule-IV
7	Koel	*Eudynamys scolopaceus* Linnaeus	Schedule-IV

Most of animals found in the study area are of least concern.

3.11.2 Aquatic life: Along its course river Son support rich aquatic habitat. Numerous species Fishes, planktons &zooplanktons are found in the study area.

3.11.2.1 Fishes: Sone River is adobe for variety of fishes. To have an idea about the fishes local peoples were asked along the proposed project, sand deposited area within the fishes local peoples were asked along the proposed project, sand deposited area within the river and on the bank. Secondary information about fishes noticed from study is Rohu, Catla, Hilsa, Mystussp, Cirrhinus Sp, etc. The species of fishes given in Table 3.16 are commonly reported in the fresh water bodies like river, streams, lakes, pond and estuaries They are cosmopolitan in distribution and are reported all over India and Indian Sub continents. These species of fishes are commonly used in aqua culture practice and had good commercial importance.

Table 3-18 Fish species of Sone River

S.No.	Local Name	Scientific Name
1	Mrigal	Cirrhinamrigala
2	Catla	Catlacatla
3	Rohu	Lebeorohita
4	Bhakur	Catla catla
5	Karosh	Labeo kalbasu
6	Nayan	Cirhinnus mrigala
7	Calbasu	Lebeocalbasu
8	Kursa	Labeo gonious
9	Rahiya	Cirhanus reva
10	Putiya	Puntius cirrahana
11	Chanandalla	Chana nama ,chandaranga
12	Chelava	Chela laubasa , chela bacuila
13	Ras-bora	Rasbora danconius
14	Padhan	Wallago attu

15	Mangul	Elarius batacus
16	Tengan	Mystus scenghala, mystus vittatus
17	Bata	Labeobata
18	Kalabans	Labeodero
19	Saul	Channa morutius ,channa vitatus ,channa stratus

(Source: Site visit and Secondary Data)

3.12SOCIO-ECONOMIC ENVIRONMENT

This section of the EIA report deals with Socio-Economic Impact assessment of the Proposed Sand Mining Project of Area 8.98 Ha at Arwal Sone Ghat-5 on Sone River of District- Arwal of State-Bihar, Country: India.

Data Collection: Following steps were considered for the collection of primary data:

1. Identifying of Study Area
2. Site Visit
3. Analysis of Data Collected

The data on socio-economic aspects in the study area has been carried out through the analysis of the secondary data available for the study area.

3.13Methodology

The methodology adopted for impact assessment is as follows:

a) The details of the activities and population structure have been obtained from Census 2011 and analyzed.

b) Primary data was collected by a door-to-door survey in urban area and household's living therein. The data collected during the above survey were analyzed to evaluate the prevailing socio-economic profile of the area.

c) Based on the above data, impacts due to construction operation on the community have been assessed and recommendations for further improvement have been made.

3.13.1 Details of District Arwal

Th**e** district of Arwal with a population of 700843 according to 2011 Census, 0.67 percent of the total population of the state comprised within the district. The district has got five Community Development Blocks viz. Arwal, Karpi, Kurtha, Sonbhadra Banshi and Kaler. There are 316 villages which form 68 Gram Panchayats in the district. There is only one municipal town, viz. Arwal Nagar Parishad. Arwal is a Small sized district and ranks 36th in

the state in order of population. The population of males and females are 363497 and 337346 spread over 0.67 percent area of the State Population 104099452 .

(Source: District Census Handbook Bhojpur)

Table 3-19 Important Statistics of the District

S. No	Particulars	Details
1.	Total population of the district	126941
2.	Total no of House holds	21014
3.	Total male	65743
4.	Total female	61198
5.	Total Literate	71790
6.	Total no. of workers	45590
7.	Total Population no of SC	28473
8.	Total Population no of ST	43

Source: Census 2011

3.14Concept & Definition

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

b) Household: A group of persons who normally live together and take their meals from a common kitchen are called a household. Persons living in a household may be related or unrelated or a mix of both. However, if a group of related or unrelated persons live in a house but do not take their meals from the common kitchen, then they are not part of a common household. Each such person is treated as a separate household. There may be one member households, two member households or multi-member households.

c) Sex ratio: Sex ratio is the ratio of males to females in a population. It is expressed as number of females per 1000 males.

d) Literates: All persons aged 7 years and above who can both read and write with understanding in any language are taken as literate. It is not necessary for a person to have

received any formal education or passed any minimum educational standard for being treated as literate. People who are blind but can read in Braille are also treated as literates.

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

f) Labor Force: The labour force is the number of people employed and unemployed in a geographical entity. The size of the labour force is the sum total of persons employed and unemployed. An unemployed person is defined as a person not employed but actively seeking work. Normally, the labour force of a country consists of everyone of working age (around 14 to 16) and below retirement (around 65) that are participating workers, that is people actively employed or seeking employment. People not counted under labour force are students, retired persons, stay-at home parents, people in prisons and discouraged workers.

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

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

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

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

k) Work participation rate: The work participation rate is the ratio between the labour force and the overall size of their cohort (national population of the same age range). In the present study the work participation rate is defined as the percentage of total workers (main and marginal) to total population.

3.15Findings of the study:

3.16Description of the Study Area:

The study area of Proposed Sand Mining Project of Area 8.98 Ha at Arwal Ghat 05 on Sone River of District- Arwal of State-Bihar, Country: India. The study area is involving 15 rural

villages; however, it comes under Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar). There are no urban areas in the study area.

Table 3-20 Demographic Profile of the Villages in the study area

S/n	Demographic Feature	Study area	
		Core zone (Project area)	10 Km Buffer
1	Total Population	0	126941
2	Male	0	65743
3	Female	0	61198
4	Schedule caste	0	28473
5	Schedule Tribe	0	43

*Source: Census of India 2011, figures in parenthesis represents percent value

3.17 Demographic composition:

According to Census 2011, Core zone doesn't have any human habitation and 10 km buffer have the total population of 126941 Individuals only. There are 22.43 percent of total populations are schedule caste, schedule tribe are less than zero percent (0.034%). The male and female percentages are 51.16 & 48.84 percent respectively.

Source: Census of India 2011

3.18 Social Infrastructure Available:

The Proposed Sand Mining Project of Area 8.98 Ha at Arwal Ghat 05 on Sone River of District- Arwal of State-Bihar, Country: India offers a much-required infrastructural input for fulfilling the requirement of quality sand in Bihar. The project site is near the Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar)

3.19Amenities

Education facilities

GA High School, Arwal,

Health Facilities

PHC, Arwal

Religious Places

Hazrat Makhdoom Syed shah shamsuddin r.a (Arwal) Sharif

Drinking water

Drinking water facility for site workers and other staffs has to be provided by the Project proponent through private tankers.

Electricity

All the habitations in the study area are provided with electricity and the same is available for domestic.

3.20 Social Setup

The study area is dominated by General caste and other backward community; Agriculture is the predominant occupation however currently there is a wave of change of occupation. There by other worker are increasing in the study area. The immediate surroundings of the projects lack the amenities. The villagers are very optimist by the proposed opening of proposed sand mining at Arwal Ghat 05. The major expectations include the solution of drinking water problem, quality education, easy availability of sand etc.

Table 3-21 Demographic particulars of the study area

S.N.	Description	Number	Percentage to Respective total
1	Total no. of villages in the study area	55	
2	Total Population of the Study Area	126941	
	Male	65743	51.79
	Female	61198	48.21
	Sex Ratio (No. of females per 1000 males)	931	
3	0-6 Year Population in Study Area	23158	
	Male	11821	51.04
	Female	11337	48.96
	Sex Ratio (No. of females per 1000 males)	959	
4	Total number of Households	21014	
	Average Household size in the Study Area as a whole	6	
5	Total Population of Schedule Caste Community in the Study Area	28473	
	Male	14802	51.99
	Female	13671	48.01
6	Total Population of Schedule Tribe Community in the Study Area	43	
	Male	21	48.84
	Female	22	51.16
7	Total Literates in the Study Area	71790	
	Male	43700	60.87
	Female	28090	60.87
8	Total illiterates in the Study Area	55151	
	Male	22043	39.97
	Female	33108	60.03
9	Total Worker Population	45590	
	Male	31007	68.01
	Female	14583	31.99
10	Main Worker Population	31580	
	Male	24616	77.95
	Female	6964	22.05
11	Marginal Workers	14010	
	Male	6391	45.62
	Female	7619	54.38

12	Cultivators	8279	
	Male	7222	87.23
	Female	1057	12.77
13	Agricultural Labour	18188	
	Male	13289	73.06
	Female	4899	26.94
14	Household Worker	889	
	Male	606	68.17
	Female	283	31.83
15	Others Workers	4224	
	Male	3499	82.84
	Female	725	17.16
16	Non- Workers	81351	
	Male	34736	42.70
	Female	46615	57.30

Source: Census of India 2011

4 ANTICIPATED IMPACTS AND THEIR MITIGATION MEASURES

4.1 GENERAL

All Mining projects, whether existing or new, have positive or negative impacts on the surrounding environment. Depending on the nature of activities and baseline environment status, the impacts are assessed for their importance. The results of these assessments are used to formulate mitigation measures and future methodology for Environmental Monitoring and Environmental Management plan.

The environmental parameters likely to be affected by mining are related to many factors, i.e. physical, social, economic, agriculture and aesthetic. The excavated sand will be transported via trucks to outsiders. The operations may disturb environment of the area in various ways, such as removal of mass, change of landscape, flora and fauna of the area, surface drainage, and change in air, water and soil quality. While for the purpose of development and economic up-liftmen of people, there is need for establishment of mining industries, but these should be environment friendly. Therefore, it is essential to assess the impacts of mining on different environmental parameters, before starting the mining operations, so that abatement measures could be planned in advance for eco-friendly mining in the area. The likely impacts on different environmental parameters due to this mining project are discussed here.

Several scientific techniques and methodologies are available to predict impacts of physical environment. Mathematical models are the best tools to quantitatively describe the cause and effect relationships between sources of pollution and different components of environment. In cases where it is not possible to identify and validate a model for a particular situation, predictions have been arrived at based on logical reasoning/consultation/extrapolation.

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

- Land Environment
- Water Environment
- Air Environment
- Noise Environment
- Biological Environment
- Socio Economic Environment
- Soil Environment

Based on the environmental baseline scenario as detailed in Chapter 3 and the proposed mining activity in Chapter 2, this chapter assesses the likely impact and their extent on various environmental parameters along with the mitigation measures.

4.2 LAND ENVIRONMENT

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

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

Anticipated Impacts:

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

Mitigation measures:

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

- Excavated pits will get replenished annually in monsoon itself & will be restored to original.
- Mineral will be mined out after leaving safety distances from both side from the bank as “No mining zone “for bank stability.
- The mine working will remain confined to allotted river bed only, so it will not disturb any surface area outside the mine lease area which may affect topography or drainage.
- Solid waste will not be stacked on the bank side as it will hinder the flow of water in monsoon season.

4.3 WATER ENVIRONMENT

Anticipated Impacts:

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

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

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

Mitigation measures

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

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

The deposit will be worked from the top surface up to a maximum depth of 3 m 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.

4.4 AIR ENVIRONMENT

Anticipated Impacts:

Emission of fugitive dust is envisaged due to:

- Mining Activities includes excavation and lifting of minerals. The whole process will be done by semi-mechanized process without drilling and blasting. Therefore, the dust generated is likely to be insignificant as compared to mining processes involving drilling, blasting, mechanized loading etc.

- 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:

4.4.1 Air Modeling

Objective

Atmospheric modelling is used by air quality managers to make decisions on effective and efficient ways to implement the National Ambient Air Quality Standards (NAAQS) and improve air quality. Air quality modelling is done to estimate the relationship between sources of pollution and their effects on ambient air quality, predict the impacts from potential emission sources, and simulate ambient pollution concentrations under different policy scenarios. They are critical for determining the relative contributions from different sources, monitoring compliance of air quality regulations, and making policy decisions

4.4.2 Air Quality Model

In order to estimate the ground level concentrations due to the emissions from the proposed project, EPA approved American Meteorological Society/Environmental Protection Agency Regulatory Model - AERMOD View 10.0.1 dispersion Model has been used. AERMOD View dispersion Model provides option to model emissions from a wide range of sources that are present at a typical industrial source complex. The model considers the sources and receptors in undulated terrain as well as plain terrain and the combination of both. The basis of the model is the steady state Gaussian Plume Equation, with modifications to model simple point source emissions from stacks that experience the effect of aerodynamic down wash due to nearby buildings, isolated vents, multiple vents, storage piles etc. AERMOD View dispersion model with the following options has been used to predict the cumulative ground level concentrations due to the proposed emissions. Area being rural, the rural dispersion parameters are considered as below:

- Predictions have been carried out to estimate concentration values over radial distance of 10 km around the sources.
- Cartesian receptor network has been considered.
- Emission rates from the sources were considered as constant during the entire period.

- The ground level concentrations computed were as in basis without any consideration of decay coefficient.
- Calm winds recorded during the study period were also taken into consideration.
- 24-hour mean meteorological data, extracted from the meteorological data collected during the study period as per guidelines of IMD/CPCB has been used to compute the mean ground level concentrations to study the impact of proposed activity.
- Stability class was evaluated based on wind direction fluctuation.
- The mathematical equations used for the dispersion modelling assumes that the earth surface acts as a perfect reflector of plume and physico-chemical processes such as dry and wet deposition and chemical transformation of pollutants are negligible.
- Washout by rain is not considered.
- Source of emission is continuous and at steady state.

Sources of Pollution/Emission

1. Active Mining Area: 100m x 100m (**Area Source)**
2. Mine Road **(Line Source)**

4.4.3 Emission Calculation

An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. The general equation for emissions estimation is:

$$E = A \times EF \times (1 - ER/100)$$

Where;

E = emissions in (gm/sec);

A = activity rate (Tonnes/Hr);

EF = emission factor (Kg/Tonnes), and

ER = Overall emission reduction efficiency, %

Emission rate of pollutants from operation of mining is calculated based on the emission factors given in the AP-42 published by USEPA. As per the emission factors published in the above documents, the emission rate has been computed and is provided below**.**

4.4.4 Quantitative estimation of impacts on air environment

An attempt has been made to predict the incremental rise of various ground level concentrations (GLCs) above the baseline status in respect of air pollution due to mining operations. The mathematical model used for predictions in the study is USEPA approved AERMOD View 10.0.1 software which is designed for point source, line source and area sources for the prediction of impacts due to mine operations. For estimation of the GLC in worst case scenario, the mining operations are assumed to be carried out on the flat terrain. The predicted GLC computed using AERMOD View developed by Lakes Environment model is plotted on isopleths and are shown in Figure given below.

4.4.5 Meteorological Data

The meteorological data recorded continuously during season of **winter** on hourly basis for wind speed, wind direction, relative humidity, precipitation and temperature and the same is processed to extract the 24-hour mean meteorological data as per the guidelines of IMD and MoEF for application of AERMOD Version 10.0.1 model. Stability classes computed for the mean hours are based on the guidelines issued by CPCB on modelling. Mixing heights representative of the region have been taken from the available published literature.

4.4.6 Stability Classification

Wind direction fluctuation method (CPCB PROBES/70/1997-1998) is adopted for hourly stability as determined by wind direction fluctuation method as suggested by Slade (1965).

$$\sigma_\Theta = Wdr/6$$

Wdr: the overall wind direction fluctuation or width of the wind direction in degrees, over the averaging period.

σ_Θ : the standard deviation of wind direction fluctuation.

The stability classes are as detailed below:

Table 4-1 Slades Stability Classification based Wind direction fluctuation

Stability Class	σ_Θ (degree)
A (Extremely Unstable)	**>22.5**
B (Moderately Unstable)	**22.4-17.5**
C (Slightly Unstable)	**17.4-12.5**
D (Neutral)	**12.4-7.5**
E (Slightly Stable)	**7.4-3.5**
F (Stable)	**<3.5**

4.4.7 Dispersion Parameters

The area is classified as urban when more than 50% of land inside a circle of **3 km** radius around the source can be considered built up with heady or medium industrial, commercial or residential units.

Table 4-2 Brigg`s Dispersion Parameters σy (m) and σz (m) (100m<x<10000m)

S.No.	Stability Class	σ_y(m)	σ_z(m)
For Rural Conditions			
1	A	$0.22x(1+0.0001x)^{-0.5}$	0.2x
2	B	$0.16x(1+0.0001x)^{-0.5}$	0.12x
3	C	$0.11x(1+0.0001x)^{-0.5}$	$0.08x(1+0.0002x)^{-0.5}$
4	D	$0.08x(1+0.0001x)^{-0.5}$	$0.06x(1+0.0015x)^{-0.5}$
5	E	$0.06x(1+0.0001x)^{-0.5}$	$0.03x(1+0.0003x)^{-1}$
6	F	$0.04x(1+0.0001x)^{-0.5}$	$0.016x(1+0.0003x)^{-1}$
For Urban Conditions			
1	A-B	$0.32x(1+0.0004x)^{-0.5}$	$0.24x(1+0.001x)^{-0.5}$
2	C	$0.22x(1+0.0004x)^{-0.5}$	0.20X
3	D	$0.16x(1+0.0004x)^{-0.5}$	$0.14x(1+0.0003x)^{-0.5}$
4	E-F	$0.11x(1+0.0004x)^{-0.5}$	0.08x(1+0.0015x)

Where x is the downwind distance in meters.

4.4.8 Mixing Height

As site specific mixing height were not available, mixing height based on CPCB publication, "Spatial Distribution of Hourly Mixing Depth over Indian Region", PROBES/88/2002-03 has been considered for model to establish the worst-case scenario.

4.4.9 Monthly Wind Speed and Wind Direction

The weather is one of the main factors affecting the air quality. Weather can help to clear away pollutants from atmosphere to improve air quality, or it can make air pollution extremely worse by helping to form highly polluted regions. The concentration of air pollutants in ambient air is governed by the meteorological parameters such as atmospheric wind speed, wind direction, relative humidity, and temperature. Rainfall can effectively remove atmospheric particulate pollutants, and the removal rate of PM10 is greater than the removal rate of PM2.5. In general wind speed more than 7 m/s can lift dust. Heavier particles will settle near the source area, with the smaller ones settling farther away. The site-specific weather data has been collected by installation of weather monitoring station at site.

Table 4-3 Weather Monitoring Data of the Site

Months	Relative Humidity, %	Rainfall, mm	Mean Wind Speed, m/sec	Wind Directions (blowing from)	Avrg Temperature (degree Celsius)
Dec	43%	32	3.5	North West	30
Jan	36%	18	3.1	West	26
Feb	50%	8	2.8	South West	18

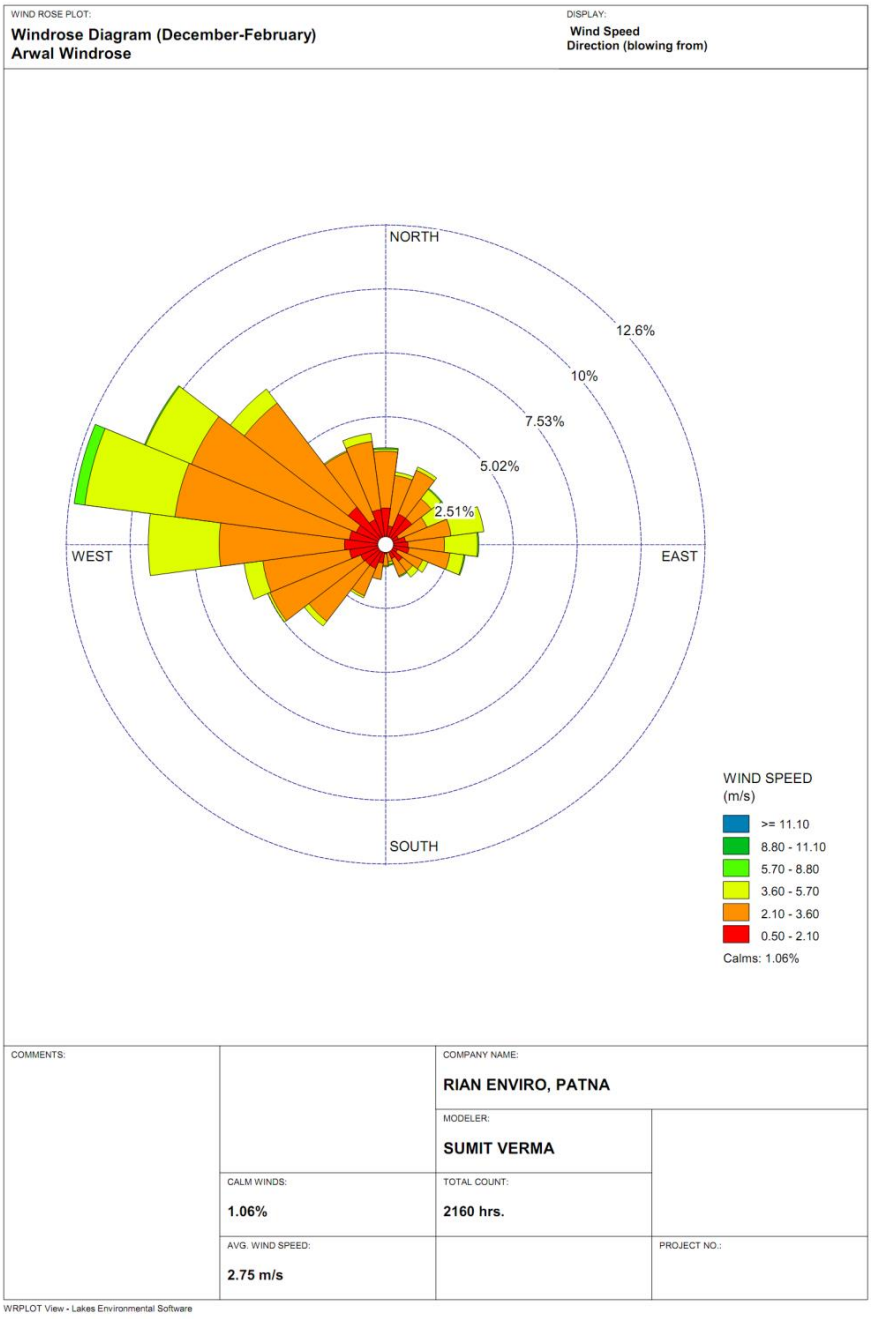


Figure 4-1 Windrose Data of the Site

4.4.10 ModelResults

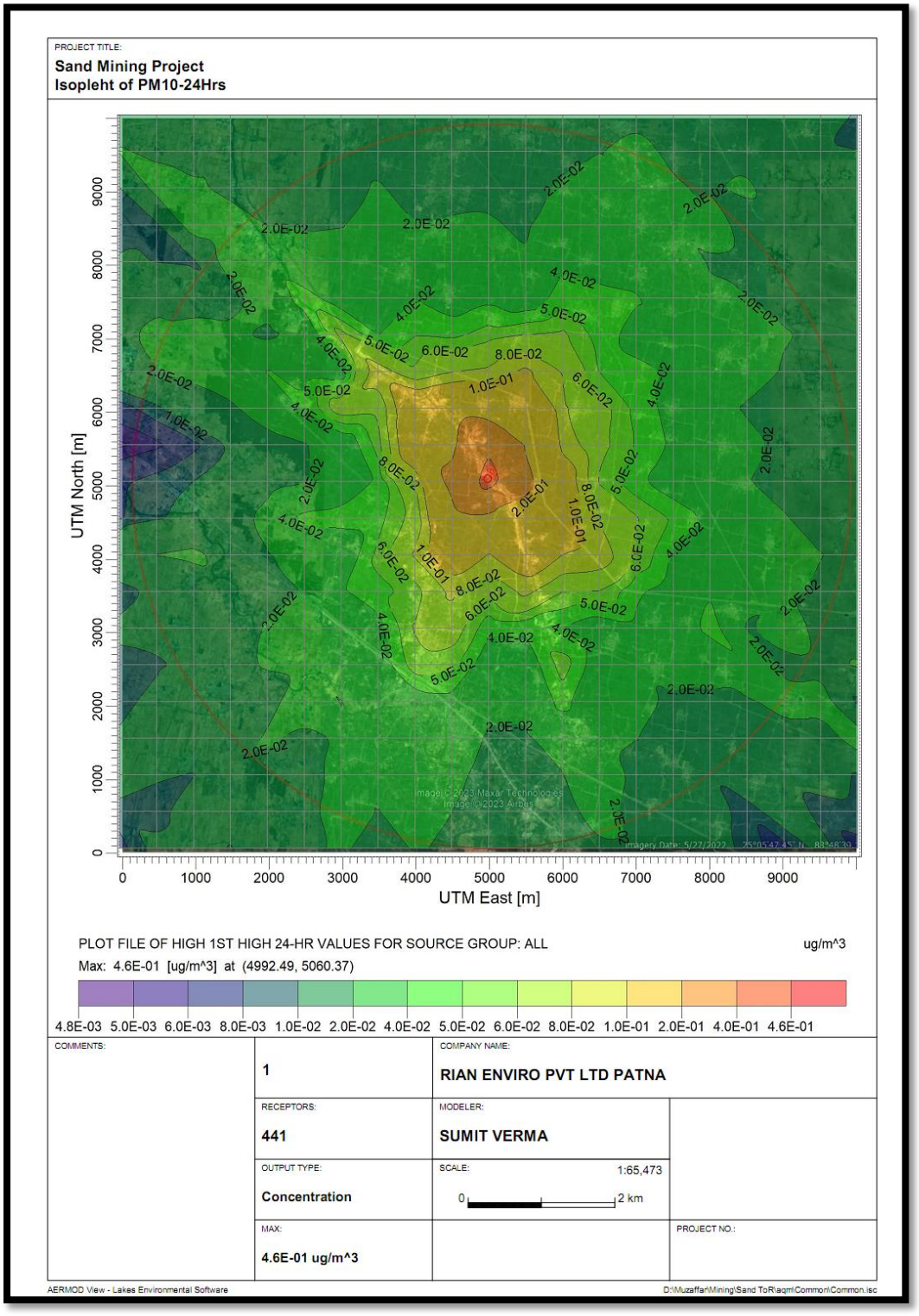


Figure 4-2 Predicted GLC concentration of PM10

4.4.11 Mitigation measures

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

- ✓ Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74%
- ✓ Speed limits will be enforced to reduce airborne fugitive dust from vehicular traffic.
- ✓ Spillage from the trucks will be prevented by covering tarpaulin over the trucks.
- ✓ 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

4.5 NOISE ENVIRONMENT

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

Anticipated Impacts:

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

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

Table 4-4 Damage risk criteria for hearing loss OSHA regulations

Maximum allowable	Sound pressure	Remarks

duration per day in hour	**dB(A)**	
(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:

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

4.6 BIOLOGICAL ENVIRONMENT

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

Anticipated Impacts:

Flora

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

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

Fauna

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

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:

Flora

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

The list of plants proposed for green belt is as follows.

Table 4-5 List of Trees proposed for Greenbelt (Evergreen, quick growing)

S/n	Botanical Name	Family	Common Name	Height	Flowering Season	Crown Shape	Crown surface area (M^2)
1	*Alstoniascholaris* (linn.)R. Br.	Apocynaceae	Chattiyan	15m	Dec - Mar.	Round	241,680.50
2	*Anonaswuamosa* Linn.	Anonaceae	Custard apple	10m	March - July extended uptosept.	Round	2178.21
3	*Anona reticulate* Linn.	Anonaceae	Bullock's Heart	10m	June.	Round	2017.44
4	*Azadirachtaindica*A. juss.	Meliaceae	Indian Lilac	20m	Jan - March, Aug. - Sept.	Spreading	300,445.30
5	*Cassia pumila*Lamk	Caesalpinaceae	Yellow Cassia	10-12m		Round	13,273.70
6	*Derris indica*(Lam.)Bennett.	Fabaceae	Pongam-Oil Tree, Karanj	10m	April - June	Round	6278.1
7	*Eucalyptus citridora Hook.*	Myrtaceae	lemon scented gum	20m	Feb. - April, Oct.- Dec.	Conical	52447.63
8	*Ficusgibbosa*Blume	Moraceae	Korotosani (Orisa)	10m	April - May	Spreading	223,45.4
9	*Guazmaulmifolia* Lamk	Sterculiaceae	Rudraki	10m	Mar - August.	Round/ Spreading	30279.8
10	*Heterophragmaroxburghii*DC	Bignoniaceae		18m	Feb. - April.	Round/ Oblong	155217.7

Fauna

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

4.7 TRAFFIC ANALYSIS

Transportation Route:

The minerals excavated will be loaded directly into trucks and transported to the concerned market. The evacuation route is shown in the map as given below:

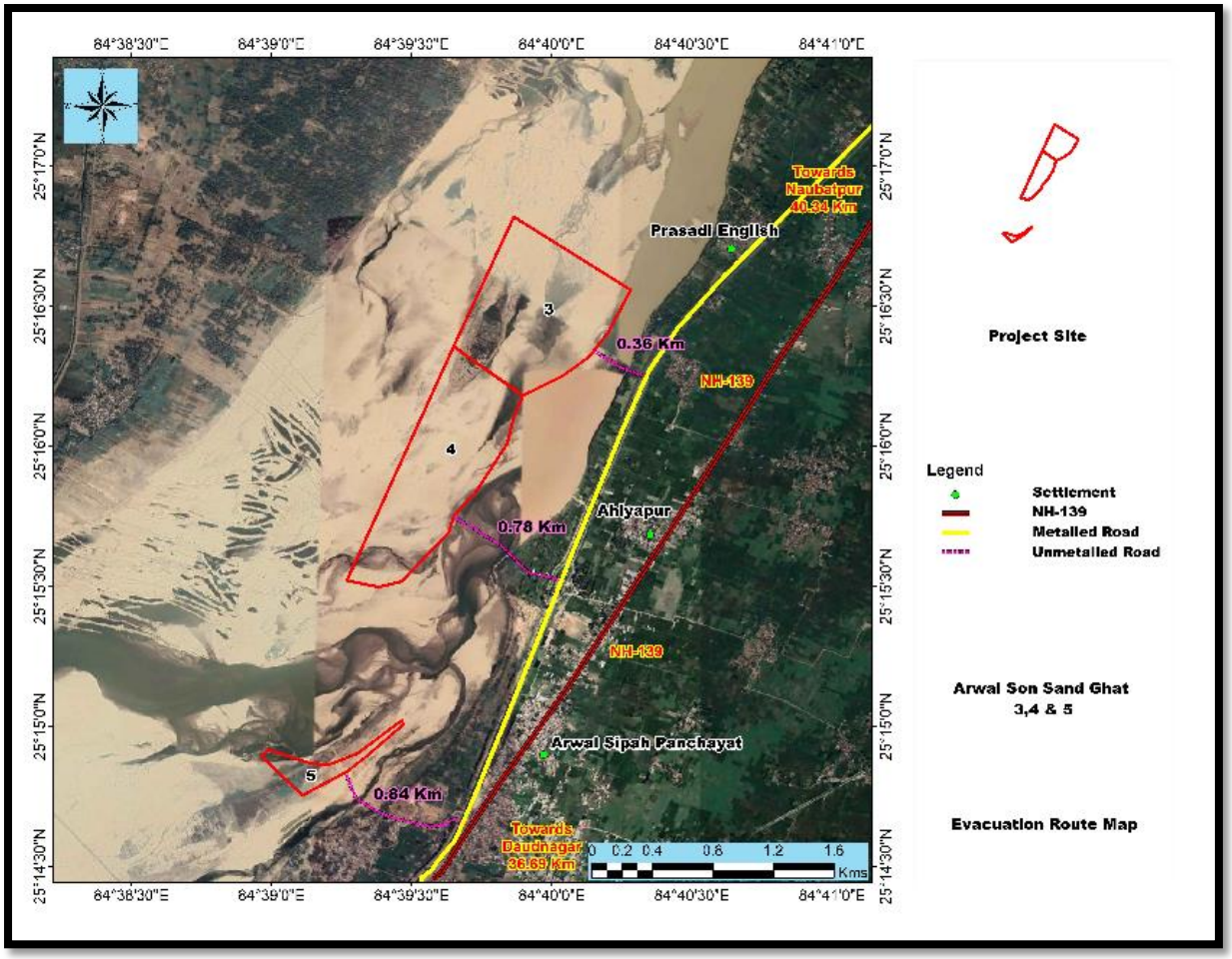


Figure 4-3 Map Showing Evacuation Route

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. Traffic density measurement were made continuously for 24 hours by visual observation and counting of vehicles under three categories, viz., heavy motor vehicles, light motor vehicles and two/three wheelers. As the mining site is well connected to the NH-139 via approx. 0.84 km towards ESE direction. (Shown in haul road map).

Table 4-6 Frequency of Trucks deployed

DURING MINE OPERATION						
Proposed Capacity of mine/annum	**No. of working days**	**Proposed Capacity of mine/day**	**Truck Capacity -tonnes**	**Frequency of trucks deployed/day**	**No. of working hours per days**	**Frequency of trucks deployed/hour**
290952	240	1,212.3	12	101	10	10

Traffic Management:

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

5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

5.1 INTRODUCTION

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

5.2 ALTERNATIVE FOR MINE LEASE

Sand (minor mineral) deposits are site specific. It is present in inside river bed **(8.98 Ha.)** The mining of the material will be done by open cast semi-mechanized method inside riverbed. The mining will be done as per laid down procedures Bihar Minerals (Concession, Prevention of Illegal Mining, Transportation & Storage) Rules, 2019 (as amended in 2021.**No overburden** from inside riverbed block will be produced. Therefore, no alternates it is suggested as the mineral is site specific.

5.3 ALTERNATIVE FOR TECHNOLOGY ANDOTHER PARAMETERS

Some alternatives considered during EIA study are discussed below:

Table 5-1 Alternative for Technology and other Parameters

S. No.	Particular	Alternative Option 1	Alternative Option 2	Remarks
1.	Technology	Opencast Semi mechanized and mechanized mining.	Opencast Mechanized mining.	Opencast semi-mechanized for Riverbed is preferred **Benefits:** •No electric power requirement •Minimal noise will be generated •Minimal air pollution will be generated.
2.	Employment	Local employment	Outsource employment	Local employment is preferred. **Benefits:** •Provides employment to local people along with financial benefits •No residential building/housing is required.

3.	Laborer transportation	Public transport	Private transport	Local labors will be deployed so They will either reach mine site by Bicycle or by foot. **Benefits:** •Cost of transportation of men will be negligible.
4.	Material transportation	Public transport	Private transport	Material will be transported through trucks/trolleys on the contract basis **Benefits:** •It will give indirect employment.
5.	Water requirement	Tanker supplier	Ground water/surface water supply	Tanker supply will be preferred. **Benefits:** •No change in the surface water or ground water quality.
6.	Road	Haul road	Metallic road	Haul road will be considered for Linking mine site from. Minimum distance will be measured along with less number of trees for considering optimum haul road roots. **Benefits**: Less distance, less fuel used, minimum or negligible no. of trees will be cut in best opted haul road root.

5.4 SUMMARY

We have analyzed all the option for alternative so the proposed mine site. This project is sand specific project and existing land use of mine lease classified as River Body which will continue to be so even after the current mining project is over, hence no alternate site is suggested for this project.

6 ENVIRONMENTAL MONITORING PROGRAM

6.1 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 area 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 and interpretation of data (iii) Preparation of reports to support environmental management system and (iv) Organizational set up responsible for the implementation of the programme. Environmental Monitoring will be taken up for various environmental components as per conditions stipulated in Environmental Clearance Letter issued by MoEF&CC and Consent to Operate issued by the State Pollution Control Board. Compliance of same will be submitted to respective authorities on regular basis.

6.2 ENVIRONMENTAL MANAGEMENT CELL

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will be complied as per conditions. For this the lessee **Radharaman Construction & Marketing Pvt. Ltd. Director. – Lalti Devi** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. The system of reporting of Non-conformances /violation of any Environmental Law/Policy will be as per quality management system. The internal audit will be conducted on periodic basis and any Non-conformances/violation to Environmental Law/Policy will be closed and discussed during Management Review Meetings of board of directors/partners.

Hierarchy

An EHS Manager will be appointed to look after all environmental issues and ensure compliance with Environmental Clearance conditions/SPCB norms. An Assistant Manager and Executive Environment Engineer will be appointed under the EHS Manager. EHS Manager will report to the Lessee directly and discuss the non-compliance if so any. An immediate solution will be arrived to ensure compliance with norms.

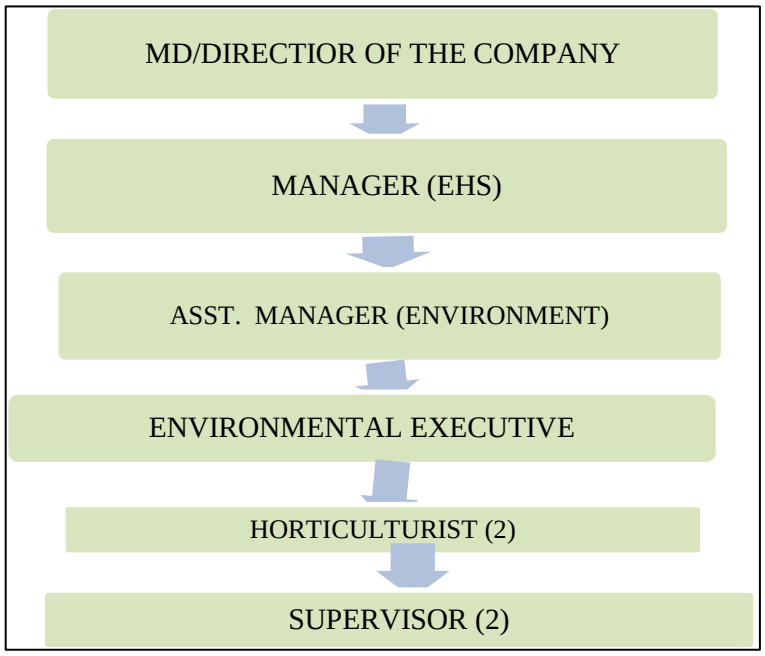


Figure 6-1 Hierarchy of Environment System for Dealing Environmental Issues

6.2.1 Responsibilities for Environmental Management Cell (EMC)

The responsibilities of the EMC include the following:

- Environmental Monitoring of the surrounding area
- Developing the green belt/Plantation
- Ensuring minimal use of water
- Proper implementation of pollution control measures
- Access the risk area
- Implementation of QMS
- Conducting Internal Audits
- Closing of NCs and conduction Management Review Meetings.

6.3 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 sit using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.

The key aims of environmental monitoring are:

- 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.
- To verify the evaluations made during the planning process, in particular with risk and impact assessments and standards and target setting and to measure operational and process efficiency.
- Monitoring will also be required to meet compliance with statutory and corporate requirements. Finally, monitoring results provide the basis for auditing, *i.e*. to identify unexpected changes.

6.4 MONITORING SCHEDULE

Regular Monitoring of all the environmental parameters *viz.*, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year in order to detect any changes from the baseline status.

Table 6-1 Monitoring Schedule

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

6.4.1 LOCATIONS OF MONITORING STATIONS

The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. Locations for the post project monitoring shall be as under.

Table 6-2 Locations of Monitoring Stations

S. No.	Description	Location
1.	Ambient Air Quality	Lease area, Villages in down Wind direction from the Lease Boundary
2.	Noise Level Monitoring	Lease Boundary, High noise generating areas within the lease boundary like joining highways, nearest village, sensitive areas in the surrounding of the mine lease.
3.	Water Level and Quality	Nearby Surface and Ground water sources
4.	Soil Quality	Lease area and Villages within study area.

Table 6-3 Budget for monitoring

S. No.	Description	Cost to be incurred (in lakhs/annum)
1	Water Quality (Surface & Groundwater), Soil Quality, Air Quality, Noise Level	2.0
TOTAL		**2.0**

6.5 Reporting Schedule during Operation of Mine

After completion of analysis, copies of all the analysis reports will be sent to MoEF&CC Regional Office and SPCB. Copies of the reports will be maintained in the office and will be made available to the concerned inspecting authorities.

6.6 BUDGET ALLOCATION FOR MONITORING

Budget for monitoring of Air, water, Noise and Soil will be **Rs. 2.0 Lakhs** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

6.7 SUMMARY

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will be complied as per conditions. For this lessee **Radharaman Construction & Marketing Pvt. Ltd. Director – Lalti Devi** has taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a sit using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters *viz.*, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, water, Noise and Soil will be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

7 ADDITIONAL STUDIES

7.1 GENERAL

This chapter will highlight the additional studies that had been performed based on feedback from internal quality assessment, regulatory authority and stakeholder. Mining operations are associated with several potential hazards that affect adversely the human health and environment. It would normally require the assistance of emergency services to handle it effectively. The mining operation will be taken up under the supervision and control of qualified staff including Mine Manager (Grade I). Similarly, Sand mines also have impending dangers and risk which need to bead dressed for which a disaster management plan has been prepared 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.

7.2 ITEMS IDENTIFIED BY PROPONENT

No requirements of additional studies have been identified due to the unique location and proposed method of mining to be adopted.

7.3 ITEMS IDENTIFIED BY REGULATORY AUTHORITY

All studies identified by regulatory authority have been discussed in detail in Chapter 4.

7.4 ITEMS IDENTIFIED BY THE PUBLIC AND OTHER STAKEHOLDERS

The public hearing will be conducted after the draft EIA submission to the concerned authorities. The issues and items identified by the public and other stake holders will be granted in the form of public hearing minutes, accordingly it will be included in Final EIA report.

7.5 RISK ANALYSIS AND DISASTER MANAGEMENT PLAN

All types of industries face certain types of hazards which can disrupt normal activities abruptly. Similarly, river bed mines also have risks which need to be addressed for which a disaster management plan has been formulated with an aim of taking precautionary steps to avert disasters and also take such action after disasters which limits the damage to minimum. In the sections below, the identification of various hazards, probable risks during the operational phase of the mining, maximum credible accident analysis and consequences analysis are addressed either qualitatively or quantitatively.

Risk assessments will help mine operators to identify high, medium and low risk levels. This is a requirement of the Occupational Health and Safety Act 2000. Risk assessments will help to

priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. The following natural/industrial problem may be encountered during the mining operation.

- ✓ Inundation: Filling of the mine pit due to excessive rains
- ✓ Slope failures at the mine face so stacks
- ✓ Accident due to fire (in forested areas)

As per proposal made under the mining plan the area will be developed by means opencast mining method. Extraction of minerals is to be carried out by open cast semi-mechanized method. Water table will not be touched during the mining process. No high-risk accidents like landslides, subsidence flood etc. have been apprehended.

7.5.1 Risks due to Inundation

Mining will be done during the non-monsoon periods (October-June); therefore, problem of inundation is not likely to happen.

7.5.2 Risks Due to Failure of Pit Slope

In order to allay dangers due to open cast slope failure, final pit, slope stability estimations will be made for the existing mines. Determining the factor of safety, the slopes should be monitored at regular intervals to check for any possible failure.

7.5.3 Risks due to Failure of Waste Dumps

All the Material excavated during mining will be saleable, therefore no waste dumps are proposed.

7.5.4 Risks of Accidents due to Trucks and Dumpers

Identifying the hazards that come along with the presence of vehicles at the workplace (e.g. reversing operations, loading) can cause harm if not properly handled. Among some of the factors that may make vehicle accidents more likely are:

- ✓ Rough access roads
- ✓ Time pressure
- ✓ Inadequate brakes (Possibly from lack of maintenance)
- ✓ Careless lyparked vehicles (*e.g*. being parked on a slope without being adequately secured)
- ✓ Unsafe coupling gand uncoupling of trailers, and

- ✓ Untrained drivers
- ✓ Overturning vehicles
- ✓ Over speeding of the vehicles

To avoid such instances, trainings will be given to the workers and their representatives and involve them in the risk assessment process and train them what to do, to reduce risk. All transportation within the mine lease area should be carried out directly under the supervision and control of management.

The vehicles will be maintained in good working condition and checked thoroughly at least once a month by the competent person authorized for the purpose by the management.

- ✓ Road signs will be provided each and every turning point up to the main road (wherever required)
- ✓ Toavoiddangerwhilereversingthevehiclesespeciallyatworkingplace/loadingpoints, stopper should be posted to properly guide reversing/spotting operating.
- ✓ Only trained drivers will be hired.

7.6 DISASTERS AND ITS MANAGEMENT

Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. The safety of the mine and the employees is taken care of by the Mines Act1952, which is well defined with laid down procedure to ensure safety and constantly monitored and supervised by Directorate General of Mines Safety and Department of Mines, State Government.

7.6.1 Identification of Hazards

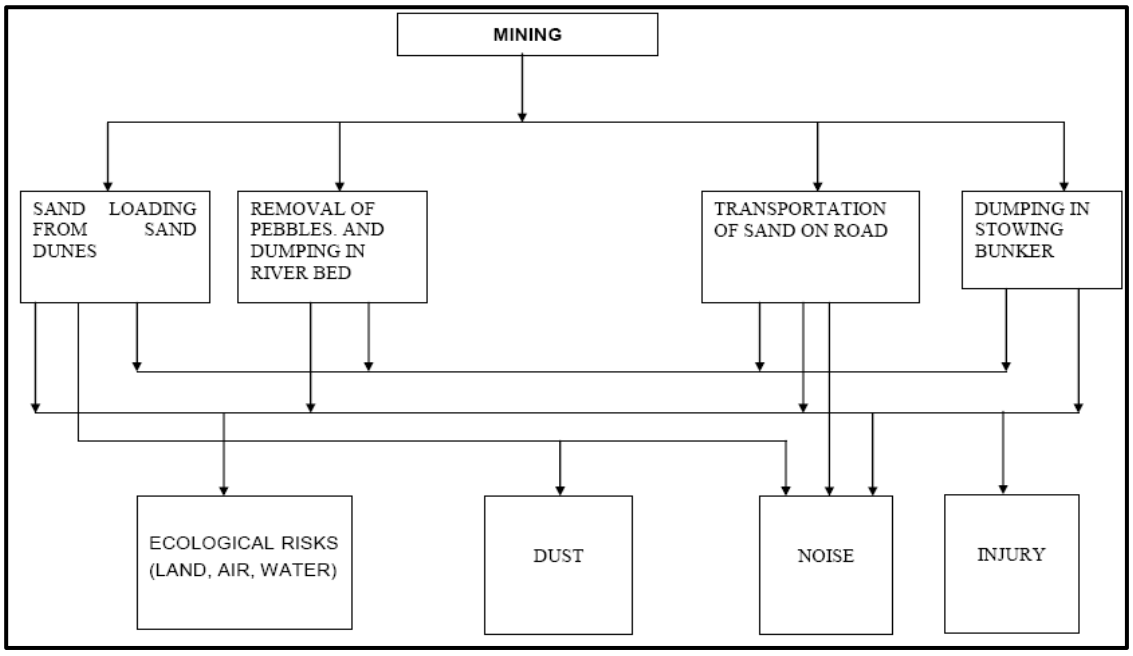
There are various factors, which can create disaster in sand mine. These hazards are as follows:

- ✓ Inundation / Flooding.
- ✓ Quick Sand Condition.
- ✓ Drowning.
- ✓ Accident due to vehicular movement.
- ✓ Accident during sand loading, transporting and dumping.

7.6.2 Sand Loading

The sand is loaded in the trucks using hand shovels and back-hoe. There are possibilities of injury in the hands during loading with shovels and staying under bucket movement.

- ✓ There are possibilities that the workers standing on the other side of loading may get injury due to over thrown sands with pebbles.
- ✓ There are possibilities of workers getting injured during opening of side covers of the trucks to facilitate sand loading.
- ✓ There are possibilities of riverbank collapse due to close proximity of sand extraction.
- ✓ There are chances of falling of cattle/children into sand pit in river bed, may be fatal due to fall in such pits were reported from other areas to the Department of Mines.
- ✓ Chance of workers getting injured due to improper balancing of truck while loading.



7.6.3 Heavy Machinery

Most of the accidents occur during transportation by dumpers, trucks and other heavy vehicles and are often attributable to mechanical failures, in which the factor of human errors cannot be ruled out.

7.6.4 Inundation / Flooding

- ✓ The possibility of inundation/flooding of the sand mines are very high during monsoon or during heavy rains in lean season as the mine area lies over the sand dunes of a riverbed.

- ✓ There are dangers to the trucks and other machineries due to flooding.
- ✓ There are dangers to the workers working in the sand dunes. Inundation or flooding is expected and beneficial for these sand mines as during this time only the sand reserve gets replenished.

7.6.5 Safety Features Required in Tippers/Trucks

- ✓ **Rear Vision System:** For assisting operator to have back view during reversing.
- ✓ **Auto dipping System:** To reduce glaring of eyes of operator during night.
- ✓ **Load Indicator and Recorder:** Enables management to detect and prevent over loading.
- ✓ **Global Positioning system:** To prevent illegal transport and selling of sand, restricting short-cut routes other than stipulated routes and computerized monitoring.
- ✓ **Seat belt reminder:** To alert operator for using the seat belt.

7.6.6 Mitigation of Hazards

7.6.6.1 Measures to Prevent Accidents during Sand Loading.

- ✓ The trucks will be brought to a level so that the sand loading operation suits to the ergonomic Condition of the workers and the back-hoe.
- ✓ The loading will be done from one side of the truck only.
- ✓ The workers will be provided with gloves and safety shoes during loading.
- ✓ Opening of the side covers (pattas) will be done carefully and with warning to prevent injury to the loaders.
- ✓ No sand will be collected within 7.5m from bank, especially from outer bank of the meandering river. Safe clearance will be mainly determined by the height of the river bank and thickness of sand to be extracted from the close vicinity of that bank.
- ✓ Ponding in the river bed shall not be allowed.
- ✓ Operations during daylight only.
- ✓ No foreign material (garbage's) will be allowed to remain/spill in river bed and catchment area, orno pits/pockets are allowed to be filled with such material.
- ✓ Stockpiling of harvested sand on the river bank will be avoided.
- ✓ For particular operations, approaching river bed from both the banks will be avoided.

7.7 REPLENISHMENT OF SAND DEPOSITS

The replenishment study has been carried out during the preparation of DSR by Subdivisional Committee, Arwal after analyzing datasets of consecutive calendar years. Both field-based surveys coupled with satellite imagery study and empirical study were carried out to determine the rate of replenishment in each river of the district. The determined values of various methods as adopted for replenishment study gives a comparable value and in all cases the values are found to be much more as compared to the capping limit (60%) as suggested in the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF & CC) 2020. It is suggested to have a periodical review along with field data acquisition during pre and post monsoon periods to record the seasonal variance of the sedimentation rate on annual basis and update this DSR in case of any abnormal findings.

Theoretical Replenishment study based on mining lease shows variation from 74.50% to 95.60% with an average of 81.52% of replenishment rate in the district while an average replenishment rate for the year for Arwal District comes to about 86.39% based on field data basis.

(Source: Approved DSR)

7.8 SOCIAL IMPACT ASSESSMENT, REHABILITATION & RESETTLEMENT (R&R) ACTION PLAN

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. SEIA is carried out separately but concurrently with Environment Impact Assessment (EIA). It focuses the effect of the project on social and economic well-being of the community.

7.8.1 Impact on Demographic Composition

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

7.8.2 Employment Opportunities

The proposed project will provide employment to the local people. It has been estimated that 10 peoplewill get direct employment in this mining project. It is a positive impact of the project since it is providing employment opportunities to the local people.

7.8.3 Increased Supply of Sand in the Market

With the commencement of the proposed mining project the supply of sand will increase and the gap between demand and supply will decrease to some extent, if not fully.

7.8.4 Impact on Agriculture

The entire mining area is part of river bed and the entire land is Government Revenue Land. It is a non-forest land and the proposed activity is to take place in the bed of river Son & agriculture field. There will be no negative impact on agriculture because compensation will be made to the land owners and agriculture land is reclaimed & give back to the land owners after the completion of mining contract so that they will again use the field for cultivation. Scientific mining will be adopted in the proposed mining project the area will be free from annual floods, which destroy standing crops, land and property. This is a positive impact of the proposed mining project.

7.8.5 Impact on Road Development

Movement of tractor-trolleys and other vehicles to and fro the mining site is expected to increase substantially, when mining will start. The existing roads connecting the quarry with the National and State Highways are mostly narrow mud roads. There will be mud slide and traffic bottle neck if these roads are not widened and their conditions are not improved. Hence, there is good scope for road development in the mining area. Further, there are risks of accidents during loading of extracted minerals into tractor-trolleys and transportation to markets for sell. However, accidents can be avoided by taking due care & precautions.

7.8.6 Income to Government

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

7.8.7 Impact on Law and Order

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

7.8.8 Impact on Health

There are no chances of occurring diseases, due to manual mining of sand. Sand is non-toxic. However, sand mining activities such as excavation and loading unloading of sand 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 should be taken.

Rehabilitation and Resettlement (R&R) action plan is not applicable for this project.

7.9 SUMMARY

Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in amine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there inadequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be started with the beginning of the mining and will be completed at the end of mine lease. This mining project has positive impact on social and economic well-being of the community because this project provides employment opportunities to local people and many social welfares works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

8 PROJECT BENEFITS

8.1 GENERAL

The proposed sand mining project will improve the socio-economic and reduce the chances of flood. This will be in form of roads, water supply, employment and economic growth.

8.2 PHYSICALBENEFITS

- ✓ Generate useful economic resource for construction.
- ✓ Improve Socio-economic conditions of surrounding areas.
- ✓ Protecting river banks.
- ✓ Reduce the probability of submergence of adjoining agricultural lands.
- ✓ Protection of crops being cultivated along the river bank.
- ✓ Reducing aggradations of river level.
- ✓ **Improvements in the physical infrastructure: -**The proposed Sand mine will have numerous induced impacts on society such as growth in schools, hospitals, hotels & restaurants, transport etc.
- ✓ **Improvements in the social infrastructure: -**The social infrastructure like repairing of handpumps, submersibles for agriculture, maintenance of nearby school infrastructure and maintenance of haulage path and village roads.
- ✓ **Employment potential –-** The present project will provide employment to 10 people.
- ✓ **Other tangible benefits: -**Deepening and cleaning of the river flood plain/bed will help in reduction of flood in the area, job opportunity to the labours.

8.3 SOCIAL BENEFITS

The mining in the area will create rural employment. It has been observed that conditions of the village around mining areas are better than that of distant villages. The mining activity in the region will have positive impact on the social economic condition of the area by way of providing employment to the local in-habitants; wages paid to them will increase the per capita income, housing, education, medical and transportation facilities, economic status, health and agriculture.

A detailed programme for socio economic development of the area has been framed. The salient features of the programme are as follows:

- ✓ Social welfare programme like provision of medical facilities educational facilities, water supply for the employees as well as for nearby villagers will be taken.
- ✓ A well laid plan for employment of the local people has been prepared by giving priority to local people.
- ✓ Supplementing Govt. efforts in health monitoring camps, social welfare and various awareness programs among the rural population.
- ✓ Assisting social forestry programme.
- ✓ Adoption of villages for general development.
- ✓ Supply of water to village nearby villages.
- ✓ Development of facilities within villages like roads, etc.
- ✓

8.4 Corporate Environmental Responsibilities

As per MoEFCC OM dated 30th Sept., 2020 adequate funds shall be earmarked as per the commitments made by project proponent and requirements to address the issues raised during the public hearing in lieu of Corporate Environment Responsibility (CER) and this will be covered under EMP. Detailed action plan for the activities along with the budgetary allocation will be incorporated in this EIA/EMP Report upon completion of public hearing.

8.5 ECOLOGICAL BENEFITS

A green belt will be developed along the boundary of the mining lease area. The area for green belt plantation consists of undisturbed soil; hence plantation could be made as in any garden or road side plantation. Green belt is erected not from biodiversity conservation point of view but is basically developed as a screen to check the spread of dust pollution. It is proposed to plant **90** Nos. of **native species** along with some fruit bearing and medicinal trees during the plan period and a budget of **Rs 3.9 Lakh** for plantation is given in **EMP.**

8.6 CONCLUSION

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide

other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant **90 Nos**. native species per during the mining plan period.

9 ENVIRONMENTAL COST BENEFIT ANALYSIS

9.1 ENVIRONMENTAL COST BENEFIT ANALYSIS

As per EIA Notification dated 14th September, 2006 as amended from time to time; the chapter on "Environmental Cost Benefit Analysis" is applicable only, if the same is recommended at the Scoping Stage.

As per the ToR points issued on dated 11-01-2023 by SEIAA Bihar, (File No.SIA/1(a)/2087/2022) the Environmental Cost Benefit Analysis is not required.

10 ENVIRONMENT MANAGEMENT PLAN

10.1 GENERAL

Environmental Management Plan is a guiding document for environmental impacts associated with the proposed projects. It is a guiding document for management of good environmental condition on the site & surrounding of the proposed sand mine. The Environmental Management Plan (EMP) has been formulated and integrated with the sand mine planning keeping in view overall scientific development of local habitat and reduce the adverse impact that may be caused due to the sand mining operation. A scientific assessment of these impacts those are likely to influence the existing environmental scenario is needed. This could also facilitate in formulating a suitable environmental management plan depicting all mitigation measures. It can help in implementing the project in an eco-friendly manner. The project activities influencing the following environmental attributes have been studied and their impacts on the following attributes have been assessed.

The Environment Management Plan (EMP) will outline the measures that will be undertaken to ensure compliance with environmental legislation and recommendations from the EAC / SEAC to minimize adverse impacts on the environment. The environmental management plan consists of the set of mitigation, management, monitoring and institutional measures to be taken during the implementation and operation of the project, to eliminate adverse environmental impacts or reduce them to acceptable levels. The present environmental management plan addresses the components of environment, which are likely to be affected by the different operations in a mine area. The environmental management must be integrated into the process of mine planning so that ecological balance of the area is maintained and adverse effects are minimized. An Environmental Management Plan (EMP) is a site specific plan developed to ensure that the project is implemented in an environmentally sustainable manner. An effective EMP ensures the application of best practice environment management to a project the purpose of an EMP is to:

I. Assists proponent in the preparation of an effective and user friendly EMP.
II. Improve the contribution that an EMP can make to the effectiveness of the environmental management process.
III. Ensure a minimum standard and consistent approach to the preparation of EMP’s.

IV. Ensure that the commitments made as part of the project's EIA are implemented throughout the project life.

V. Ensure that environment management details is captured and documented at all stages of a project.

The design of EMP for operational phase has been aimed to achieve the following objectives:

I. To ensure adoption of state of art technological environmental control measures and implementing them satisfactorily.

II. Effectiveness of mitigatory measures in mitigation of impacts.

III. Description of monitoring program of the surrounding environment.

IV. Institution arrangements to monitor effectively and take suitable corrective steps for implementation of proper EMP.

V. An Environmental Management Cell (EMC) should be set up to take care of all environment aspects and to maintain environmental quality in the project area.

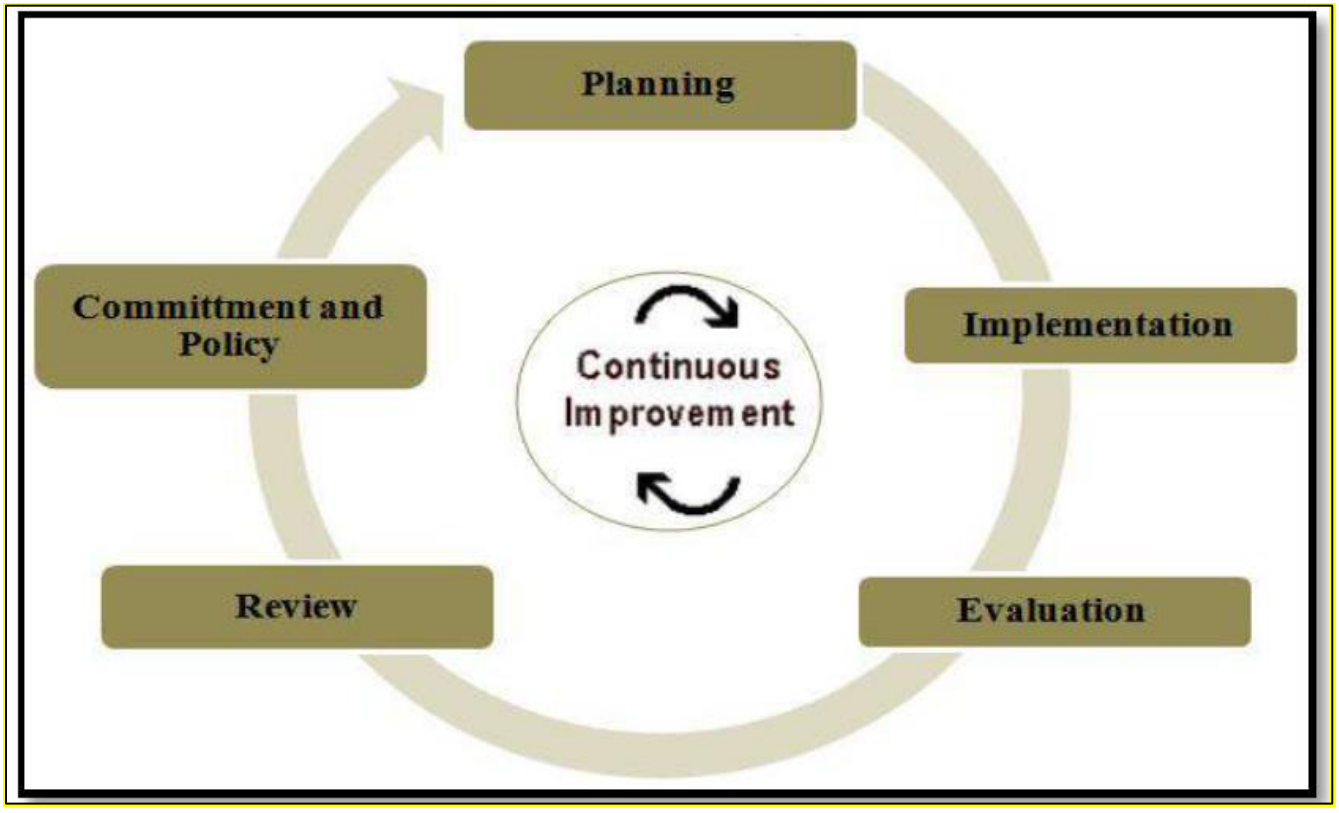


Figure 10-1 Flow Chart of EMP

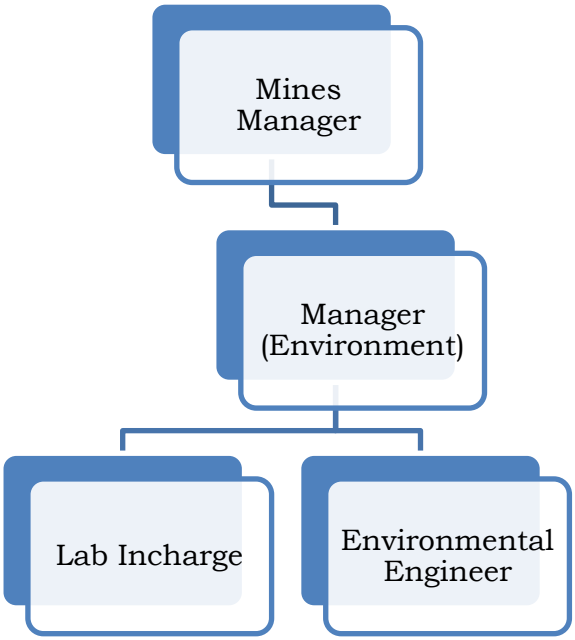


Figure 10-2 Environment Management Cell

10.2 LAND USE PATTERN

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

I. Mineral will be mined out after leaving sufficient safety zone from the bank as per sand Enforcement & Monitoring Guidelines for Sand Mining 2020

II. The mining is planned in non-monsoon seasons only, so that the excavated area gets replenished during the monsoon each year.

III. Pits will get replenished naturally every year after monsoon.

IV. Grass/plants will be planted on the bank of the river for their stability.

10.3 AIR ENVIRONMENT MANAGEMENT

Mitigative measures suggested for air emission control will be based on the baseline ambient air Quality monitoring data. From the point of view of maintenance of an acceptable ambient air quality in the region, it is desirable that the air quality needs to be monitored on a regular basis to

check it vis-à-vis the NAAQS prescribed by MoEF&CC and in cases of non-compliance, appropriate mitigative measures will be adopted. In order to minimize impacts of mining on air and to maintain it within the prescribed limits of CPCB/ SPCB, an Environmental Management Plan (EMP) has been prepared. This will help in resolving all environmental and ecological issues likely to cause due to mining in the area.

During the course of mining no toxic substances are released into the atmosphere as such there seems to be no potential threat to health of human beings. In the mining activities, the only source of dust emission from loading & gaseous emissions is from the engines of vehicles. The reasons may be quality of fuel, improper operation of the engine, etc, proper maintenance of engines will improve combustion process and brings reduction in pollution.

10.3.1 Control of Gaseous Pollution

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

10.3.2 Control of Dust Pollution

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

a) During loading operation

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

II. Skilled operators will operate excavators.

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

b) During Transport operation

I. All the haulage roads including the main ramp be kept wide, leveled, compacted and properly maintained and watered regularly during the shift operation to prevent generation of dust due to movement of dumpers, and other vehicles.
II. Mineral carrying trucks will be effectively covered by Tarpaulin to avoid escape of fines to atmosphere.
III. Regular Compaction and grading of haul roads to clear accumulation of loose material.
IV. Air quality will be regularly monitored both in the core zone and the buffer zone.

c) Plantation work carried out

In order to reduce air pollution in the surroundings, green belt will be developed along mine approach road. The plantation will be done along the bank of a river.

d) Monitoring of air pollution

Periodic air quality survey will be carried out to monitor the changes consequent upon mining activities as per the norms of CPCB.

10.4 NOISE AND VIBRATION ENVIRONMENT

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

10.4.1 Noise Abatement and Control

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

VI. Mining will be done on day time only.

10.5 Surface and Ground Water Management

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

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

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

III. Local people will be employed and no permanent housing will be done so no permanent drainage pattern for sewerage system is required as domestic sewage shall be disposed of into septic tank followed by soak pits.

IV. Monitoring of water quality of nearby surface water, ground water and domestic water will be conducted once in every season except monsoon to evaluate the performance of the mitigation measures.

10.5.1 Waste Water Management

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

10.5.2 Water Conservation

The project does not consume any process water except for drinking, dust suppression and plantation. Plantation is proposed, which will increase the water holding capacity and help in recharging of ground water.

10.6 SOLID WASTE MANAGEMENT

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

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

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

10.7 GREEN BELT DEVELOPMENT

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

10.7.1 Plantation Program

Under the afforestation plan, plantation in nearby villages and connecting roads will be undertaken. The implementation for development of greenbelt will be of paramount importance as it will not only add up as an aesthetic feature but will also act as a pollution sink. The species to be grown in the areas will be dust tolerant and fast growing species so that a permanent greenbelt is created. Plantation in the barrier zone and roads is necessary as these areas will contain fine particulates resulting from mining operation and vehicle movement. Mining activities will not cause any harm to riparian vegetation cover as the working will not extend beyond the offset left against the banks in the river. It is proposed to have plantation on both sides of the roads as greenbelt to provide cover against dust dissemination. River banks will be strengthened by way of plantation on the banks. Plantation will also be carried out as social forestry programme in village, school and the areas allocated by the Panchayat/State authorities. Native plants and other local species will be planted. A suitable combination of trees that can grow fast and also have good leaf cover shall be adopted to develop the greenbelt. It is proposed to plant **90 numbers** of native species will be planted during the plan period. List of Species for Greenbelt Development is given in Table 10.1. Plantation will increase the water holding capacity and help in recharging of ground water. No artificial rainwater harvesting is proposed for the present project.

Table 10-1 List of Species for Greenbelt Development

S/n	Botanical Name	Family	Common Name	Height	Flowering Season	Crown Shape	Crown surface area (M^2)
1	*Alstoniascholaris*	Apocynaceae	Chattiyan	15m	Dec - Mar.	Round	241,680.50
2	*Anonaswuamosa*	Anonaceae	Custard apple	10m	March - July extended uptosept.	Round	2178.21
3	*Anona reticulate*	Anonaceae	Bullock's Heart	10m	June.	Round	2017.44
4	*Azadirachtaindica*	Meliaceae	Indian Lilac	20m	Jan - March, Aug. - Sept.	Spreading	300,445.30
5	*Cassia pumila*	Caesalpinaceae	Yellow Cassia	10-12m		Round	13,273.70
6	*Derris indica*	Fabaceae	Pongam-Oil Tree, Karanj	10m	April - June	Round	6278.1
7	*Eucalyptus citridora*	Myrtaceae	lemon scented gum	20m	Feb. - April, Oct.- Dec.	Conical	52447.63
8	*Ficusgibbosa*	Moraceae	Korotosani (Orisa)	10m	April - May	Spreading	223,45.4
9	*Guazmaulmifolia*	Sterculiaceae	Rudraki	10m	Mar - August.	Round/ Spreading	30279.8
10	*Heterophragmaroxburghiji*	Bignoniaceae		18m	Feb. - April.	Round/ Oblong	155217.7

Source: Guidelines for development of greenbelt CPCB-2007

10.8 SOCIO-ECONOMIC ENVIRONMENT

10.8.1 Management Plan for Socio-Economic Environment

I. In general, socio-economic environment will have positive impact due to the mining project in the area.
II. The deployed laborers will be from nearby villages only as these people are mainly dependent upon such mining activities.
III. In order to further improve the socio-economic conditions of the area, the management will contribute for development works in consultation with local bodies.

10.9 OCCUPATIONAL HEALTH AND SAFETY

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

Occupational Health and Safety professionals in the minerals industry may perform the Following tasks-

I. The collection of minor minerals from the Sand mine does not cause any occupational ill effects.
II. Except fugitive dust generation there is no source which can show a low probability for health-related diseases and proper dust suppression will control dust generation and dispersion.
III. Dust masks will be provided to the workers working in the dust prone areas as additional personal protective equipment.
IV. The occupational health hazards have so far not been reported.
V. Awareness program will be conducted about likely occupational health hazards so as to have preventive action in place.

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

VII. Periodical medical checkup will be conducted.

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

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

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

XI. Coordinate emergency procedures, mine rescues, firefighting and first aid crews;

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

Table 10-2 Budget for occupational health

S. No.	Activities recommended for communities' level services	Tentative cost (Lakh Rs)
1	Awareness campaigns regarding health issues in the nearby villages.	**0.50**
2	Provide free health checkups & medicines to the nearby villagers of the project site.	**1.0**
3	Assistance to set up a temporary health center during the lease tenure.	**1.0**

10.10 COST OF EMP MEASURES

Following provisions are proposed to be taken for improving, control and monitoring of environment protection measures.

Table 10-3 Budget for EMP (Lakhs)

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	**Nil**	**4.0**
2	Pollution Monitoring i) Air Quality ii) Water (Surface & Ground) Quality iii) Noise Quality iv) Soil Quality	--	2.0
3	Plantation and salary for one gardener (part time basis).	1.8	0.5
4	Haul road Maintenance Cost	2.1	1.44
TOTAL		**3.9**	**7.94**

10.11 SUMMARY

As per Above discussion there is no measure impact on the environment due to mining except fugitive mission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx**.** 90 trees during plan period**.** It will prove an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget of Rs. **3.9** Lakh (Capital Cost) & **7.94** Lakhs (Recurring Cost) for EMP is incurred by Project Proponent.

11 SUMMARY & CONCLUSION

11.1 INTRODUCTION

As per MoEF&CC, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as category B-1 due to project area is more than 5.0 Ha. The LOI was granted in favor of Radharaman Construction & Marketing Pvt. Ltd, Director . – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S-Danapur, PatnaVide letter No1150/Kh, dated 26.10.2022, for the period of 5 years (A copy of LOI is attached as Annexure-I.)

The Proposed Sand Mining Project Project at Khata no. –104, Khasra No.- 617 of Arwal Sone Ghat-5 on Son River, Area: 8.98 Hectares, Mauza- Makhdumpur,, Block– Arwal, District- Arwal (Bihar). Mine Lease Area –8.98 Ha for production of **290952 TPA**

Table 11-1: Details of the Project

<table>
<tr><th>S. No.</th><th>Particulars</th><th>Details</th></tr>
<tr><td>1.</td><td>Nature and Size of the Project</td><td>Mining of Sand Minor Minerals with Production Capacity of 161640 CUM or 290952 Tonnes /Year (M.L. Area- 18.98ha).</td></tr>
<tr><td>2.</td><td>Location</td><td></td></tr>
<tr><td></td><td>Plot/Survey/Khasra No.</td><td>
<table>
<tr><th>River Name</th><th>Khata no</th><th>Khasra no</th><th>Name of the Ghat</th><th>Area (Ha.)</th></tr>
<tr><td>Sone</td><td>104</td><td>617</td><td>Arwal Sone Ghat-5</td><td>8.98</td></tr>
</table>
</td></tr>
<tr><td></td><td>Mauza</td><td>Mauza- Makhdumpur</td></tr>
<tr><td></td><td>Tehsil</td><td>Block- Arwal</td></tr>
<tr><td></td><td>District</td><td>Arwal</td></tr>
<tr><td></td><td>State</td><td>Bihar</td></tr>
<tr><td>Geographical Coordinates</td><td>Latitude and Longitude of</td><td>Arwal Sone Ghat-5:-
<table>
<tr><th colspan="3">Coordinates of the Lease Boundary</th></tr>
<tr><td>Sl no.</td><td>Latitudes</td><td>Longitudes</td></tr>
<tr><td>1</td><td>25.248625</td><td>84.649784</td></tr>
<tr><td>2</td><td>25.24782</td><td>84.652276</td></tr>
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			7	25.250082	84.657799
			8	25.24821	84.655628
			9	25.247305	84.654468
			10	25.245901	84.651838
			11	25.248226	84.649405
			12	25.248625	84.649784
	Toposheet (OSM) No.	G45M7, G45M8, G45M11, G45M12			
3.	**Lease Area Details**				
	Lease Area	8.98Ha.			
	Type of Land	River bed of Son			
	Topography	Undulated (Riverbed)			
	Site Elevation Range	71.85 m to 71.25 m			
4.	**Cost Details**				
	Cost of the project	Rs. 325.19 Lakhs (Including Auction Cost)			
	Cost for EMP	3.9 Lakh (Capital Cost) & 7.94 Lakhs (Recurring Cost)			
5.	**Environmental Settings of the area**				
	Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius	There is no any Ecological Sensitive Areas (National Park, Wild Life Sanctuary, Biosphere Reserve, Reserve/ Protected Forest etc.) within 10 Km radius.			
	Nearest Town/ Major City with population	Nearest Town & District Headquarter: Arwal, Approx. 1.0 km towards SE			
	Nearest Railway Station	Nagrigram Halt Railway Station, approx. 22.5 Km towards NW			
	Nearest National/State Highway	NH 139-Approx. 0.84 Km towards East.			
	Nearest Airport	Patna Airport, approx. 58 Km towards NE.			
	Nearest Post	Head Post office Arwal, Approx. 1.2 Km towards ESE direction.			

	Office	
	Medical Facilities	PHC, Arwal Approx. 1.0 Km towards East
	Education Facilities	GA High School, Arwal Approx. 1.0 Km towards East
	Seismic Zone	Zone III(IS 1893: 2002)
	Water Body	Son River (Riverbed)

11.2 PROJECT DESCRIPTION

The proposed project is for mining of Sand (Minor Mineral) by open cast semi-mechanized method in over an area of **8.98 Ha** by **Radharaman Construction & Marketing Pvt. Ltd** throughout Arwal Sone Ghat-5 of district Arwal. The district experiences severe cold during winter whereas on the other hand in summer it is very hot. The project site falls under seismic zone IV which is a high damage risk zone (MSK VIII-IX). About 73.63 percent of the geographical area of North Bihar is considered to be prone to floods. Bihar often faces drought situation of different scales/levels that intrinsically lead to famine situations. The total geological reserve is 484920 **Tonne s**and total mineable reserve is **2,90,952 Tonnes.** Mine lease area will be worked in benches and the digging depth will be restricted to 3.0 m only or before water table, whichever come fast. This will be further replenished during rainy season. Mineral Sand will be transported by trucks. The deposit is moderate to good quality sand. It is widely used in construction, buildings, bridges and other infrastructure. It is free from clay and non-sticky in nature. Total water requirement for the project is **5.4 KLD**. Total man power requirement for the project is **10.** The site facilities like temporary, rest-shelter, first aid facility, drinking water facility etc. will be provided as per requirement. There is no litigation pending against this project.

11.3 DESCRIPTION OF ENVIRONMENT

The generation of primary data as well as collection of secondary data and information from the site and surroundings was carried out during 7th December 2022 to 5th March 2023.The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from mine lease boundary (buffer zone), both of which together comprise the study area. Baseline environment was determined within the study area, which represents 10 km radius of the surrounding area to the project site. This collected data was further used to identify potential

impacts of the mining activity on the surrounding environment and formulate mitigation measures.

Summary of the baseline data collected is detailed in Table 10.2

Table 11-2 Baseline Environmental Status

Attribute	Baseline status
Ambient Air Quality	The ambient air quality study for the 8 AAQ monitoring stations shows that the maximum and minimum ground level concentration for PM_{10} is respectively 76.7 µg/m^3 at AQ8 and 49.5 µg/m^3at AQ6. Whereas the maximum and minimum ground level concentration for $PM_{2.5}$ ranges between 43.1 µg/m^3 at AQ5 and 26.7 µg/m^3 at AQ3 respectively. Similarly, for SO_2, the maximum and minimum ground level concentration varies between 18.5 µg/m^3 and 8.6 µg/m^3 for respectively AQ6 and AQ4 stations. For NO_2 the maximum and minimum ground level concentration varies between 31.7/m^3&13.0 µg/$m^3$for respectively AQ7 and AQ2 stations.
Noise Levels	Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 46.5 dB (A) at NQ6 & 53.1 dB (A) at NQ7. The minimum & maximum noise levels at night time were found to be 33.8 dB (A) at NQ8& 41.3 dB (A) at NQ7.
Water Quality	5 Groundwater samples and 4 surface water samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards by Indian Standards IS: 10500. From the Surface water analysis it is evident that most of the parameters of the samples comply with 'Category 'D' standards of CPCB are indicating their suitability for Propagation of Wild life and Fisheries.
Soil Quality	Samples collected from identified locations indicate pH value ranging from 7.47 to 8.12 which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 0.96 % to 1.22% in the soil samples and, whereas the

	Potassium is found to be ranging from 254 mg/kg to 354.8 mg/kg.
Ecology and Bio-diversity	There are no Ecologically Sensitive Areas present in the study area.

11.3.1 ANTICIPATED IMPACTS AND MITIGATION MEASURES

Based on the Baseline Environment, as determined in Chapter 3, environmental impacts of the mining activity on the surrounding environment are described in following sub-sections.

11.3.2 Impact on Land Use Pattern

Presently there is no activity on the land. The project site is located on bank of river. There is no human settlement in the near vicinity of the project. Restoration of mine lease area is a natural process. There would not be cutting & felling of trees.

11.3.3 Impact on Air Quality

Information on air quality was studied and predicted that the mining activity will not affect the air quality in a significant manner. In mining operations, loading, and transportation operations may causes the deterioration in air quality. In the present case, only wet materials will be handled. The collection and lifting of minerals will be done Semi mechanized mining method shall be adopted for the mining of sand. Therefore, the dust generated is insignificant. Water sprinkling will be done in regular manner for dust suppression.

11.3.4 Impact of Noise Levels

Noise level will increase due to transportation. The project site away from the villages no major impact of the noise level will be there. Vehicle with low noise level will be preferred for the project.

11.3.5 Impact on Water Quality

More over due to small scale of mining operation using minimum machineries, dust suppression is by water spraying through water sprinkler limited to haulage road. Rainwater flowing through the exposed mine cuts would carry some sediment of soil and rock. These are found to be nontoxic in nature and the runoff from mining area are the deposits of the river which were carried in past. Surface runoff water from mines has only high turbidity during monsoon. As discussed, the mining activity will require very less quantity of water in comparison to the recharging. Hence, it will not affect the water regime of the area.

11.3.6 Impact on Soil Quality

The soil textures a yellowish, light-colored variety of red soil. The basin land of the rivers is mostly sandy soil, and the land adjacent to the rivers is sandy loam. It is due to settling of air borne dust or due to wash off of solid particulates by surface or ground water. This may lead to change in porosity, permeability & other such physical characteristics of soil of the area.

11.3.7 Flora & Fauna

Flora

Floral environment is affected by mining activities due to:

- Air Pollution i.e. both dust & gaseous pollution
- Water pollution
- Land Pollution

Pollutant like dust, gaseous emanations, solid & liquid effluents will be minimized at the generation point itself and adequate measures will be taken to prevent their impact on environment.

ii) There is no forest in the core zone of mining lease area and its surrounding. So, there will be no deforestation due to mining.

iii) The mining lease area is devoid of vegetation. So, the greenery to be developed under green belt development programme will improve the floral environment of the area.

Fauna

There is no likelihood of any adverse impact on the faunal environment too due to mining activities.

11.3.8 Socio-Economic Profile

The social demographic profile of the area is not likely to be much affected, as there is not much displacement of people due to the project. The mining in the area will create rural employment. The mining activity in the region has positive impact on the social economic condition of the area by providing employment to the local in habitants; wages paid increase the per capita income.

11.4 ANALYSIS OF ALTERNATIVES (TECHNOLOGY AND SITE)

We have analyzed all the option for alternatives of the proposed mine site. This project is sand specific project and existing land use of mine lease classified as River Body which will continue

to be so even after the current mining project is over, hence no alternate site is suggested for this project.

11.5 ENVIRONMENTAL MONITORING PROGRAM

This chapter includes the technical aspects of monitoring the effectiveness of mitigation measures (including measurement methodologies, data analysis, reporting schedules, emergency procedures, detailed budget & procurement schedules). In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will complied as per conditions. For this lessee **Radharaman Construction & Marketing Pvt. Ltd. Director. – Lalti Devi** taken decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the proposed mine with the objectives mentioned in approved Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a sit using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters *viz.*, air, water, noise and soil as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations was selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature. A budget for monitoring of Air, Water, Noise and Soil will be **Rs. 2.0 Lakhs** to be incurred by the project proponent for undertaking pollution prevention measures during the mining activity.

11.6 ADDITIONAL STUDIES

Risk assessments will help to priorities the risks and provide information on the need to safely control the risks. In this way, mine owners and operators will be able to implement safety improvements. Mining and allied activities are associated with several potential hazards to both the employees and the public at large. A worker in a mine will be able to work under conditions, which are adequately safe and healthy. At the same time the environmental conditions also will not impair his working efficiency. This is possible only when there is adequate safety in mines. Hence mine safety is one of the most essential aspects of any working mine. It is very important to conserve the scheduled fauna in the area by the local authority as well as by the forest

officials. People are not aware about the wildlife and protection of wild animals. There is an urgent need of education and awareness to local people about the wild life and their importance. A green belt will be developed around the core zone. Green belt plantation will be done upto completion of plan period. This mining project has positive impact on social and economic well-being of the community because this project provides employment opportunities to local people and many social welfare works done by project proponent. There is no displacement of the population within the project area and adjacent nearby area.

11.7 PROJECT BENEFITS

The management will recruit the semi-skilled and unskilled workers from the nearby villages. The project activity and the management will definitely support the local Panchayat and provide other form of assistance for the development of public amenities in this region. The company management will contribute to the local schools, dispensaries for the welfare of the villagers. A suitable combination of trees that can grow fast and also have good leaf cover will be adopted to develop the green belt. It is proposed to plant **90** Nos. of native species will be planted during the mining plan period. Other than this social development of village will be considered as per social activities. Socio-economic environment will have positive impact due to the mining project in the area. The mining activity will create employment opportunities to local communities. The project will not only improve the living standard of local people but also create an aesthetic value to the river banks where green belt will be developed.

11.8 ENVIRONMENT MANAGEMENT PLAN

As per Above discussion there is no measure impact on the environment due to mining except fugitive emission in the form of dust generated during handling of mineral. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation development will be carried out in the mine premises, along the approach roads, around Govt. buildings, schools approx**. 90 trees during plan period.** It will prove an effective pollution mitigate technique, and he provided to the locals only as providing extraction of minerals from the mine site is the only prevailing occupation for them for their livelihood. A budget **of Rs 3.9 Lakh (Capital Cost) & 7.94 Lakhs (Recurring Cost)** per year for **EMP** is incurred by Project Proponent.

11.8.1 Air Quality Management

The only air pollution sources are the road transport network of the trucks. The dust suppression measures like water spraying will be done on the roads. Utmost care will be taken to prevent spillage from the trucks. Overloading will be prevented. Plantation activities along the roads will also reduce the impact of dust in the nearby villages.

11.8.2 Management for Noise Pollution

As the only impact is due to transportation of sand to the construction though village roads, emphasis will be given on the following points.

- Minimum use of Horns at the village area.
- Timely maintenance of vehicles and their silencers to minimize vibration and sound.
- Phasing out of old and worn out trucks.
- Provision of green belts along the road networks.
- Care will be taken to produce minimum sound during loading.

It was found that the sand mining activity will not have any significant impact on the biological environment of the region. Since mining activity is carried out only during the day time, the movement of animals during the night will not be hindered.

11.8.3 Water Management

The deposits occur in the middle/bottom of the river. During the entire lease period, the deposit will be worked from the top surface to 3 m bgl or above ground water level, whichever comes first.

11.8.4 Soil Management

Topsoil is stored separately and used for plantation work in the mined out area. Green belt development around the area minimizes the impact of mining on soil characteristics like its texture, chemistry & even Soil Erosion in the area.

11.8.5 Green Belt Development

The green belts will be designed to control PM 10, gaseous pollutants, noise, surface run off and soil erosion etc.

11.9 CONCLUSION

This Project will provide several benefits to the nearby Villages by a proper planning and management. This project will employ most of the worker from nearby villages. Only supervisor Staff will be hired from outside. There will not be any increase in population due to the project. However, few people from other area may migrate in this area for business opportunities. During the operation of this project no adverse impact on the surrounding environment. So project is beneficiary for the surrounding village. From the baseline study and various discussions on probable impacts of all the operational activity, it has been concluded that this project will have more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.

12 DISCLOSURE OF CONSULTANTS ENGAGED

Declaration by Experts contributing to the Draft EIA/EMP report Draft EIA Report for Proposed Sand Mining Project of Area 8.98 Ha at Arwal Sone Ghat-5 on Sone River of District-Arwal State-Bihar.

The one season baseline data used in the report was collected in (7th Dec 2022 to 5th March 2023.) by our empanelled lab Enviro Tech Services.

12.1 Brief profile of REPL is as given below

Director	Mr. Manish Kumar
Name of the Consultant	Rian Enviro Pvt. Ltd.
Address	Mangal Market Patna -800014

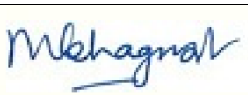
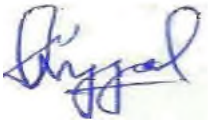
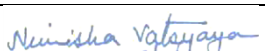
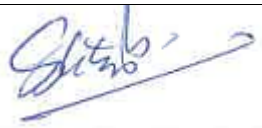
12.2 Personnel involved in the preparation of Final EIA/EMP report are stated below

Accreditation Certificate of the Consultant Engaged:

EIA coordinator:	**Date**
Name: - Mohan Shriram Bhagwat	**02/05/2023**
	

Functional Area Experts:

S. No.	**Functional Area**	**Name of the experts**	**Involvement Period and Task**	**Signature**
1.	WP	Bhuwan Bhaskar (WP)	Preparation of WP input, impact assessment & mitigation measures	
2.	AP	Muzaffar Ahmad	Collected the ambient air data through secondary sources and suggested Air pollution control measures	

S. No.	Functional Area	Name of the experts	Involvement Period and Task	Signature
3.	LU	Debarati Ghosh	Development of landuse maps of study area using GIS / related tools, site visit for ground reality survey, finalization of landuse maps, and contribution to EIA documentation.	
4.	Geo	Mohan ShriramBhagwat	Collection of secondary data as well as drafting of report with respect to Geological Aspect.	
5.	HG		Collection of secondary data as well as drafting of report with respect to Hydro-geological condition in around the study.	
6.	SW	SumitVerma	Preparation of SW input, impact assessment & mitigation measures	
7.	AQ	Vishal Duggal (AQ)	Collected the meteorological data and AAQ data through secondary sources, predicted impacts on air quality using suitable AQ model and suggested air pollution control measures	
8.	SC	Mrs. NimishaVatsyayan	Proposing the soil management practices during construction and operation phase of project.	
9.	EB	Dr Shatrunjay Singh	Generating the ground truthing ecological assessment with secondary data from different departments, earmarking rare and endangered species.	

S. No.	Functional Area	Name of the experts	Involvement Period and Task	Signature
10.	SE	Manish Kumar	Collected the primary and Secondary data, livestock inventory/ impacts, identified village-wise amenities/ needs.	
11.	RH	KailashNath Sharma	Preparation of RH input, impact assessment & mitigation measures	
12.	HW	KailashNath Sharma	Preparation of HW input, impact assessment & mitigation measures	
13.	NV (Team Member)	Bhuwan Bhaskar	Collected the ambient noise data through secondary sources and suggested Noise pollution control measures during project	

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Certificate of Accreditation

Rian Enviro Private Limited

202 & 401, Mangal Market, Sheikhpura,
Raja Bazar, Patna, Bihar-800014

*The organization is accredited as **Category-B** under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations, Version 3: for preparing EIA-EMP reports in the following Sectors –*

S. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1	Mining of minerals – opencast mining	1	1 (a) (i)	A
2	Thermal power plants	4	1 (d)	B
3	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4	Cement plants	9	3 (b)	A
5	Synthetic organic chemicals industry	21	5 (f)	B
6	Distilleries	22	5 (g)	A
7	Highways,	34	7 (f)	A
8	Building and construction projects	38	8 (a)	B
9	Townships and Area development projects	39	8 (b)	B

Note: Names of approved EIA Coordinators and Functional Area Experts are mentioned in IAAC minutes dated June 11, 2021 and supplementary assessment minutes dated December 17, 2021 posted on QCI-NABET website.

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in QCI-NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/21/1792 dated July 6, 2021. The accreditation needs to be renewed before the expiry date by Rian Enviro Private Limited, Patna following due process of assessment.

NABET

Sr. Director, NABET
Dated: February 28, 2022

Certificate No.
NABET/EIA/2124/IA 0079(Rev.01)

Valid up to
March 10, 2024

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

Annexure-I

Copy of LoI

Cluster-5

समाहरणालय, अरवल।

(खनन शाखा)

पत्रांक 1150 /खनन, अरवल दिनांकः– 26/10/2022

प्रेषित,

राधारमण कंस्ट्रक्शन एण्ड मार्केटिंग प्रा0 लि0
निदेशक–लालती देवी, पिता–मेदनी राय,
तृतीय तल, प्लौट नं0–388/389, बिस्कुट फैक्ट्री मोड़, नासरीगंज,
पो0–दानापुर, थाना–दानापुर, पटना।
मो0–9931149278, ईमेल–rrmpl@gmail.com

विषय :– अरवल जिलान्तर्गत सोन नदी के बालूघाट मखदुमपुर की आगामी पांच वर्षो के लिए बंदोबस्ती हेतु दिनांक 18.10.2022 को सम्पन्न ई–नीलामी में उच्चतम डाकवक्ता घोषित होने के उपरांत सैद्धांतिक स्वीकृत्यादेश निर्गत करने के संबंध में।

उपर्युक्त विषयक अरवल जिलान्तर्गत सोन नदी के बालूघाट मखदुमपुर की आगामी पांच वर्षो के लिए बंदोबस्ती हेतु दिनांक 18.10.2022 को सम्पन्न ई–नीलामी में आपके द्वारा मो0–2,42,46,000.00 (दो करोड़ बियालिस लाख छियालिस हजार) के विरूद्ध उच्चतम डाक की राशि मो0–3,15,19,800.00 (तीन करोड़ पंद्रह लाख उनीस हजार आठ सौ) रूपया बोली के उपरांत उच्चतम डाकवक्ता घोषित हुए है। निविदा दस्तावेज की कंडिका–20(i) के आलोक में आपके द्वारा नीलामी राशि के 25 प्रतिशत(अग्रधन राशि समायोजनोपरांत) प्रतिभूति राशि मो0–18,18,450.00 (अठारह लाख अठारह हजार चार सौ पचास) रूपया के भूगतान के साक्ष्य दिनांक 20.10.2022 को कार्यालय में प्रस्तुत किया गया है।

निविदा दस्तावेज की कंडिका–20(i)(ii)(iii)(iv)(v) के आलोक में जिलान्तर्गत सोननदी के मखदुमपुर बालूघाट का सैद्धांतिक स्वीकृत्यादेश निम्न शर्तो एवं बंधेज के साथ दिया जाता हैः–

1. सोन नदी के मखदूमपुर बालूघाट का संछिप्त विवरणी निम्नवत हैः–

क्रं0स0	नदी का नाम	रकवा(हे0 में)	Geo-Coordinates	
1	सोन नदी (Perennial)	8.98	25.248625	84.649784
			25.24782	84.652276
			25.247705	84.65339
			25.248408	84.655128
			25.250165	84.657477
			25.25034	84.657795
			25.250082	84.657799
			25.24821	84.655628
			25.247305	84.654468
			25.245901	84.651838
			25.248226	84.649405
			25.248625	84.649784
1	वन क्षेत्र से दूरी		लागू नहीं	
2	सुरक्षित क्षेत्र/वन अभ्यारण्य/पक्षी अभ्यारण्य/जीव अभ्यारण्य क्षेत्र से दूरी		लागू नही	
3	बालूघाट से 500 मीटर के अंदर खनन पट्टा क्षेत्र की दूरी		अन्य पट्टा 500 मीटर से दूर	
4	पुरातात्विक स्थल की दूरी		लागू नही	
5	खनन योग्य मात्रा		161640 घनमीटर	
6	थाना/खाता/खेसरा संख्या		24/104/617	

2. भुगतान की शर्तेः–

(i) नीलामी–राशि केवल प्रथम वर्ष के लिए बंदोबस्ती की राशि मानी जाएगी। दूसरे वर्ष और उसके बाद की बंदोबस्ती की राशि गत् वर्ष की बंदोबस्ती राशि के 120 प्रतिशत् के बराबर होगी।

(ii) प्रतिभूति जमा के अतिरिक्त बंदोबस्तधारी निम्नलिखित समय सारणी/भुगतान अनुसूची के अनुसार बंदोबस्ती की राशि का भुगतान करेगा :–

किस्त	भुगतान की नियत तारीख
प्रथम किस्त (50%)	(क) पट्टा संविदा निष्पादन से पहले (पहले वर्ष के लिए) (ख) प्रथम वर्ष में पट्टा संविदा निष्पादन की तिथि से एक वर्ष पूरा होने के 60 दिन पूर्व और अनुक्रमिक वर्षों में इसी प्रक्रिया का पालन करते हुए जमा किया जायेगा।
द्वितीय किस्त (25%)	03 महीना पूरा होने से पहले।
तृतीय किस्त (25%)	06 महीना पूरा होने से पहले।

प्रत्येक समानुदान वर्ष में बंदोबस्तधारी द्वारा पहली किस्त के भुगतान के समय दूसरी और तीसरी किस्तो की राशि के लिए पोस्टडेटेड चेक संबंधित समाहर्त्ता, अरवल के समक्ष जमा की जायेगी। यदि किस्तों के भुगतान करने में बंदोबस्तधारी असफल होता है तो आगे ई–चालान सिस्टम द्वारा बंद कर दिया जाएगा और केवल अग्रिम भुगतान कर दिये जाने के बाद ही खोला जाएगा एवं इसके लिए किसी तरह के क्षतिपूर्ति का कोई दावा मान्य नहीं होगा।

3. **GST का भुगतान :–** बंदोबस्तधारी को जी0एस0टी0 के रूप में प्रचलित दर के अनुसार राशि वाणिज्य कर विभाग को भुगतान करना होगा। जिला खनन् कार्यालय अरवल में जी0एस0टी0 भुगतान का प्रमाण प्रत्येक किस्त के साथ देना होगा।

4. **आयकर/अन्य करों का भुगतानः–** बंदोबस्तधारी को आयकर अधिनियम के तहत आयकर एवं उस पर नियमानुसार देय अधिभार का भुगतान आयकर विभाग के प्रचलित दर के अनुसार एक मुश्त करना होगा। यह राशि बंदोबस्ती राशि के प्रत्येक किस्त के साथ देय होगी। जिला खनन् कार्यालय,अरवल द्वारा यह राशि आयकर मद में जमा करा दी जायेगी।

5. **जिला खनिज फाउन्डेशनः–** Bihar Mineral District Foundation Rules, 2018 के अनुसार बंदोबस्ती राशि की 2 प्रतिशत राशि जिला खनिज फाउण्डेशन को जिला खनन पदाधिकारी, अरवल के पदनाम से भुगतेय बैंक ड्राफ्ट के माध्यम अनुसार करना होगा।

6. **वैधानिक अनापत्तिः–** बालूघाट संचालन हेतु आवश्यक समस्त वैधानिक अनापत्ति/अनुमति (जैसेः– खनन योजना, पर्यावरणीय स्वीकृति, जल एवं वायु सहमति आदि सफल डाकवक्ता द्वारा प्राप्त की जाएगी। वैधानिक अनापत्ति/अनुमति प्राप्त करने के पश्चात् ही बालू खनन प्रारंभ किया जा सकेगा। वैधानिक अनापत्ति/अनुमति के बिना अथवा वैधानिक अनापत्ति/अनुमति में अनुज्ञात मात्रा से अधिक मात्रा या निर्धारित क्षेत्र से बाहर खनन किए जाने की दशा में सुसंगत नियमों के अनुसार संबंधित सफल डाकवक्ता/बंदोबस्तधारी पर कार्रवाई की जाएगी। वैधानिक अनापत्ति/अनुमति निम्नानुसार हैः–

   i. **खनन योजनाः–** खनन योजना प्रभावी नियमों में उल्लिखित प्रावधानों के अनुसार सफल डाकवक्ता/बंदोबस्तधारी द्वारा QCI/NABET से मान्यता प्राप्त Professional RQP से तैयार कर निदेशक, खान या विभाग द्वारा प्राधिकृत पदाधिकारी के समक्ष लेटर ऑफ इंटेंट निर्गत होने से 30 दिनों के अन्दर अनुमोदन के लिए प्रस्तुत करेगा। खनन योजना बनाने पर होने वाले व्यय का वहन संबंधित खनिज डाकवक्ता/बंदोबस्तधारी द्वारा किया जायेगा। साथ ही खनन योजना की जाँच हेतु समाहर्त्ता/विभाग अन्य ऐजेंसी चयनित कर सकेगा, जिसका निर्धारित फीस/खर्च भी बंदोबस्तधारी को ही वहन करना होगा। सफल डाकवक्ता/बंदोबस्तधारी खनन योजना के अनुसार खनन करना सुनिश्चित करेंगे।

   ii. **पर्यावरणीय स्वीकृतिः–** सफल डाकवक्ता/बंदोबस्तधारी खनन योजना अनुमोदन के 15 दिनों के अन्दर पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार के सक्षम प्राधिकार के समक्ष पर्यावरणीय स्वीकृति (EC) के लिए प्रस्ताव समर्पित करेगा। समयबद्ध रीति से पर्यावरणीय एवं अन्य वैधानिक स्वीकृति प्राप्त करना सफल डाकवक्ता की जिम्मेवारी होगी। अपेक्षित पर्यावरणीय स्वीकृति एवं अन्य आवश्यक स्वीकृति प्राप्त करने में किसी भी प्रकार की देरी के लिए सफल डाकवक्ता स्वंय जिम्मेवार होंगे एवं इस संबंध में किसी भी प्रकार की क्षतिपूर्ति के लिए कोई भी दावा मान्य नहीं होगा।

   iii. **जल एवं वायु सहमतिः–** पर्यावरणीय स्वीकृति प्राप्त करने के पश्चात सफल डाकवक्ता अधिकतम 07 (सात) दिवस के अंदर जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 तथा वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 के अधीन सक्षम पदाधिकारी के समक्ष सहमति/ Consent to Establish/ Consent to Operate प्राप्त करने हेतु आवेदन प्रस्तुत करेगा।

iv. खनन के लिए अनुमत मात्राः– खनन योजना, पर्यावरणीय स्वीकृति तथा जल (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1974 तथा वायु (प्रदूषण निवारण एवं नियंत्रण) अधिनियम, 1981 के तहत प्राप्त सहमति मे वर्णित बालू की मात्रा (इनमें से जो भी कम हो) तक ही खनन अनुमान्य होगा। यदि अनुमोदित खनन योजना, पर्यावरणीय स्वीकृति तथा जल एवं वायु सहमति में खनन योग्य मात्रा कम किये जाने पर भी वार्षिक देय बंदोबस्ती राशि किसी स्थिति में कम नहीं की जाएगी।

v. बिना किसी वैध कारण के पर्यावरणीय स्वीकृति, Consent to Establish/ Consent to Operate /जल एवं वायु सहमति प्राप्त नहीं कर पाते है या प्राप्त करने में रूचि नहीं लेते है तो, समाहर्त्ता द्वारा अग्रधन राशि जप्त कर पुनः निलामी की कार्रवाई की जाएगी।

7. **बंदोबस्ती विलेख/पट्टा संविदा (डीड) निष्पादन करनाः–**

i. सफल डाकवक्ता द्वारा सभी वैधानिक अनापत्ति प्राप्त करने के उपरान्त 5 वर्षों की अवधि के लिए बालू खनन करने हेतु समानुदान/बन्दोबस्ती स्वीकृत किया जाएगा। सफल डाकवक्ता विहित प्रपत्र में संबंधित नियमानुसार बंदोबस्ती विलेख अथवा उसके समरूप एक प्रपत्र, कार्य आरंभ करने के पहले, निष्पादित करेगा तथा यथा विहित अपेक्षित प्रतिभूति राशि जमा देगा। बंदोबस्तधारी के पट्टे की अवधि विलेख/संविदा निष्पादन की तिथि से पॉच वर्षों के लिए विधिमान्य होगा।

ii. बंदोबस्तधारी को निष्पादित **संविदा का निबंधन संबंधित विभाग के प्रचलित नियमों के अधीन 01 माह के अन्दर** कराना अनिवार्य होगा।

8. सफल डाकवक्ता/बंदोबस्तधारी द्वारा बंदोबस्ती प्रत्यर्पण/कारोबार छोड़ने का विकल्प बिहार खनिज (समानुदान, अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली 2019 के नियम 50 के अनुरूप किया जा सकेगा।

9. **सामान्य शर्त्तें :–**

(I) बंदोबस्तधारी नदी तट से बालू प्रेषण के बिन्दु पर एक साईनबोर्ड लगाएगा जिसपर बंदोबस्तधारी का नाम एवं पता, बंदोबस्ती की अवधि, स्थानीय मैनेजर का नाम एवं पता तथा बालू का विक्रय मूल्य प्रदर्शित किया जाएगा। यदि साईन बोर्ड निरीक्षण में नहीं पाया गया तो शास्ति अधिरोपित की जाएगी।

(ii) बंदोबस्तधारी श्रम विधियों के प्रावधानों के अनुसार आश्रय गृह, पीने का पानी, शिशु गृह (क्रेचेज) तथा फर्स्ट एड किट की व्यवस्था संबंधित बालूघाटों में लगे श्रमिकों के लिए करेगा।

(iii) बंदोबस्तधारी संबंधित क्षेत्रों का निरीक्षण करेगा तथा स्वयं/ अथवा अपने द्वारा अधिकृत प्रतिनिधियों के माध्यम से बालूघाटों का प्रचालन करेगा। किसी रूप में किये गये उपपट्टा (सबलेटिंग) के लिए बंदोबस्ती रद्द कर दी जाएगी। बालूघाटों/नदी तल तक बालू के परिवहन के प्रयोजनार्थ पहुँच पथ (अप्रोच रोड़) का निर्माण बंदोबस्तधारी द्वारा स्वयं अपने खर्च से किया जाएगा।

(iv) बालूघाट की सुरक्षा की जिम्मेदारी सफल डाकवक्ता/बंदोस्तधारी की होगी।

(v) सफल डाकवक्ता/बंदोबस्तधारी बंदोबस्त क्षेत्र के भीतर किसी अवैध खनन के लिए जिम्मेवार होगे और पायी गई किसी भी शिकायत पर गंभीरता से विचार किया जाएगा तथा बंदोबस्तधारी के विरूद्ध आपराधिक मामला दायर किया जाएगा।

(vi) सफल डाकवक्ता/बंदोबस्तधारी समाहर्त्ता द्वारा बालूघाटों का संचालन के संबंध में लोकहित में जारी निर्बधनों और शर्त्तो तथा निदेशों का पालन करेगा।

(vii) यथोक्त शर्त्तो बंधेजों एवं निर्बधनों का पालन नहीं करने पर कारण पूच्छा निर्गत कर बंदोबस्ती रद्द करने की कार्रवाई की जा सकेगी।

(viii) सफल डाकवक्ता/बंदोबस्तधारी को खनन राजस्व/जी0एस0टी0/आयकर/स्टाम्प शुल्क/रजिस्ट्रेशन फीस का भुगतान नही करने की दशा में 30 दिनों के अंदर कारण स्पष्ट करने हेतु नोटिस दी जायेगी। निर्धारित अवधि के अंदर बंदोबस्तधारी द्वारा बकाए का भुगतान करने में असफल रहने की दशा में राशि वसूली की कार्रवाई के साथ–साथ बंदोबस्ती रद्द करने की भी कार्रवाई की जाएगी।

(ix) नीलामी हेतु प्रस्तावित बालूघाटों से संबंधित तकनीकी तथा अन्य बिन्दुओं यथा भूमि के अंचल, थाना, मौजा, खाता, खेसरा, रकबा तथा GPS Co-ordinate के संबंध में विवाद/त्रुटि पाए जाने पर संशोधन का अधिकार संबंधित जिला खनन कार्यालय का होगा। बालूघाटों का सीमांकन एवं नियमानुसार निर्धारित आयाम/विशिष्टियों का सीमा स्तंभ का अधिष्ठापन GPS Co-ordinate के अनुसार बालू बंदोबस्तधारी को कराना होगा तथा खनन के क्रम में संधारित कराना बंदोबस्तधारी की जवाबदेही होगी, जिसे RQP/ अंचलाधिकारी की उपस्थिति में प्रमाणित कराकर खनन कार्य कराना होगा। बालूघाटों के निर्धारित क्षेत्र का Reduced Level

(RL)/Pre-Level (PL) एवं Satellite images मानसून के पूर्व एवं बाद का समर्पित करना होगा।

(x) बालूघाट से लिंक रोड और बालूघाट के बीच कोई प्राकृतिक जल मार्ग सिंचाई नहर पड़ती हो तो खनिज समानुदान धारक जल संसाधन विभाग की पूर्व अनुमति से बालू के परिवहन के लिए अस्थायी संरचनाएँ खड़ा कर सकेगा। पूर्व अनुमति के लिए ऐसे आवेदन जल संसाधन विभाग के संबंधित मुख्य अभियंता के समक्ष दिए जाएंगे।

(xi) बालूघाट में रैयती/बंदोबस्त जमीन होने पर संबंधित रैयत से सहमति प्राप्त कर बालू का खनन करना होगा। यह जिम्मेदारी पूर्णतः बंदोबस्तधारी की होगी एवं विभाग से कोई क्षतिपूर्ति का दावा मान्य नहीं होगा।

(xii) बंदोबस्तधारी द्वारा बंदोबस्ती अवधि के दौरान किसी भी कारण से खनन कार्य नहीं करने की स्थिति में किसी भी प्रकार का मुआवजा/नुकसान एवं क्षतिपूर्ति का दावा मान्य नहीं होगा।

(xiii) ई–नीलामी एवं बालूघाट की बंदोबस्ती अवधि के दौरान उत्पन्न किसी भी प्रकार का विवाद बिहार खनिज (समानुदान, अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली 2019, (यथा संशोधित) के अधीन होगा।

(xiv) सफल डाकवक्ता/बंदोबस्तीधारी को इलेक्ट्रॉनिक माध्यम से भेजी गयी कोई भी सूचना/निदेश/आदेश इत्यादि IT-Act के तहत स्वीकार्य साक्ष्य के रूप में माना जाएगा।

26/10

समाहर्त्ता,
अरवल।

Annexure-II

Mine Plan Approval Letter

बिहार सरकार,
खान एवं भूतत्व विभाग।

पत्रांक– 6004 –/एम0, पटना, दिनांक– 07/12/2022

प्रेषक,

कमलेश कुमार सिंह,
संयुक्त सचिव

सेवा में,

ई0 मेल

राधारमण कंस्ट्रक्शन एण्ड मार्केटिंग प्रा0 लि0
निदेशक–लालती देवी, पिता–मेदनी राय,
तृतीय तल, प्लौट नं0–388/389, बिस्कुट फैक्ट्री मोड़, नासरीगंज,
पो0–दानापुर, थाना–दानापुर, पटना।
मो0–9931149278, ईमेल–rrmpl@gmail.com

विषयः– **अरवल जिला के सोन नदी बालूघाट सं0– 05 के खनन योजना के अनुमोदन के संबंध में।**

महाशय,

उपर्युक्त विषय के संबंध में कहना है कि बिहार बालू खनन नीति–2019 यथा संशोधित एवं बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशांधित 2021) के नियम–17 में वर्णित प्रावधानों के तहत् **अरवल जिला के सोन नदी बालूघाट सं0– 05** से संबंधित समर्पित खनन योजना के अनुमोदन पर प्राधिकृत समिति द्वारा समीक्षा की गई। समीक्षोपरांत निम्न शर्त्तों एवं बंधेजों के तहत् खनन योजना अनुमोदित की जाती है –

1. उक्त खनन योजना केन्द्र सरकार/राज्य सरकार द्वारा विनियमित अन्य सभी अधिनियम/नियमावली में वर्णित प्रावधानों को तथा किसी न्यायालय/अन्य न्यायिक संस्था द्वारा पारित किये गये न्यायादेश को बिना प्रभावित किये अनुमोदित किया जा सकता है।
2. उक्त खनन योजना का अनुमोदन खान एवं खनिज (विकास एवं विनियमन) अधिनियम, 1957 (यथा संशोधित), बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 के नियम–17, वन संरक्षण अधिनियम, 1980, पर्यावरण सुरक्षा अधिनियम, 1986, श्रम संबंधी नियम, EMGSM 2020 तथा अन्य सभी सुसंगत अधिनियम/ नियमावली तथा उनमें वर्णित प्रावधानों के प्रतिकूल नही होगा। लीज के रकवा के अनुसार प्रति हेक्टेयर कम से कम 10 पौधा लगाना होगा तथा 50 प्रतिशत Survival सुनिश्चित करना होगा।
3. खनन योजना में निहित शर्त्तों का पालन करते हुए ही बालू खनिज का खनन् तथा प्रेषण किया जायेगा।
4. संबंधित सक्षम प्राधिकार से यथा वांछित प्रमाण–पत्र प्राप्त कर विभाग को अवगत कराना अनिवार्य होगा।
5. यदि किसी भी समय खनन योजना में वर्णित शर्त्तों के अनुपालन में अनियमितता पायी जाती है, तो खनन पदाधिकारी को नियमानुसार आवश्यक कार्रवाई करने का अधिकार होगा।
6. संबंधित बालूघाट में खनिज की उपलब्धता, पहुँच पथ का निर्माण तथा अन्य खनन् कार्यों से संबंधित सम्पूर्ण जबाबदेही बालूघाट संचालनकर्त्ता की होगी तथा इसमें किसी भी तरह का कोई दावा अथवा क्षतिपूर्ति मान्य नहीं होगा।
7. खनन योजना मे वर्णित सभी तकनीकि तथा अन्य बिन्दुओं से संबंधित ऑकड़ों की सत्यता / वैधता की जिम्मेवारी RQP/बंदोबस्तधारी की होगी तथा भविष्य में उपर्युक्त के संबंध में किसी प्रकार की भिन्नता/अनियमितता की पूरी जबावदेही RQP/बंदोबस्तधारी की होगी।
8. खनन् कार्य के दौरान घाट संचालनकर्त्ता द्वारा पर्यावरण संबंधी मानकों का नियमित रूप से अनुश्रवण करने की व्यवस्था करनी होगी।खनन् कार्य के दौरान नदियों के प्राकृतिक बहाव आदि में किसी भी तरह का व्यवधान/रूकावट/बदलाव करना पूर्ण रूप से प्रतिबंधित होगा।

P.T.O.

9. बालूघाट में Secondary Loading की व्यवस्था इस प्रकार सुनिश्चित की जाएगी ताकि गीला बालू का परिवहन नहीं हों।

10. यद्यपि खनन योजना में Semi-mechanised mining को प्राथमिकता दी गयी है तथापि Manual Mining पर कोई प्रतिबंध नहीं रखा जाएगा एवं स्थानीय व्यक्तियों को नियोजन देने के दृष्टिकोण से Manual Mining को उचित अवसर प्रदान करना होगा।

11. सफल डाकवक्ता/बंदोबस्तधारी द्वारा खान एवं खनिज (विकास एवं विनियमन) अधिनियम, 1957, बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशोधित 2021) तथा बिहार बालू खनन नीति, 2019 के प्रावधानों का अनिवार्य रूप से पालन किया जायेगा।

12. सफल डाकवक्ता/बंदोबस्तधारी को पर्यावरण सुरक्षा हेतु सभी उपाय करने होगें तथा नियमित रूप से जल/वायु की गुणवत्ता की जाँच/अनुश्रवण की व्यवस्था सुनिश्चित करनी होगी।

13. सफल डाकवक्ता/बंदोबस्तधारी को उत्पादन/प्रेषण का आँकड़ा एवं पंजी संधारित करना अनिवार्य होगा जिसे नियमित रूप से अद्यतन किया जाएगा।

14. संचालन करने वाले घाटों की सीमांकन कराना, RL/PL प्राप्त करना एवं उसे खनन के क्रम में संधारित कराना सफल डाकवक्ता/बंदोबस्तधारी की जवाबदेही होगी, जिसे RQP/अंचलाधिकारी की उपस्थिति में प्रमाणित करवाकर खनन कार्य करना होगा।

15. बिहार खनिज (समानुदान अवैध खनन, परिवहन एवं भंडारण निवारण) नियमावली, 2019 (यथा संशोधित 2021) में वर्णित प्रतिबंधित क्षेत्रों में किसी प्रकार का खनन् कार्य वर्जित होगा।

16. बालूघाटों से बालू का निष्कासन एवं प्रेषण आबादी से सटे ग्रामीण सड़क को छोड़कर अलग मार्ग से करना होगा।

17. खनन योजना की एक–एक प्रति, जो संबंधित RQP द्वारा प्रत्येक पृष्ठ पर हस्ताक्षरित होगी, निदेशक, खान एवं भूतत्व विभाग के कार्यालय के अतिरिक्त समाहर्त्ता, अरवल के गोपनीय कोषांग, उपनिदेशक, मगध अंचल, गया के कार्यालय में उपलब्ध कराना सुनिश्चित किया जायेगा, ताकि किसी भी समय इसकी जाँच की जा सके।

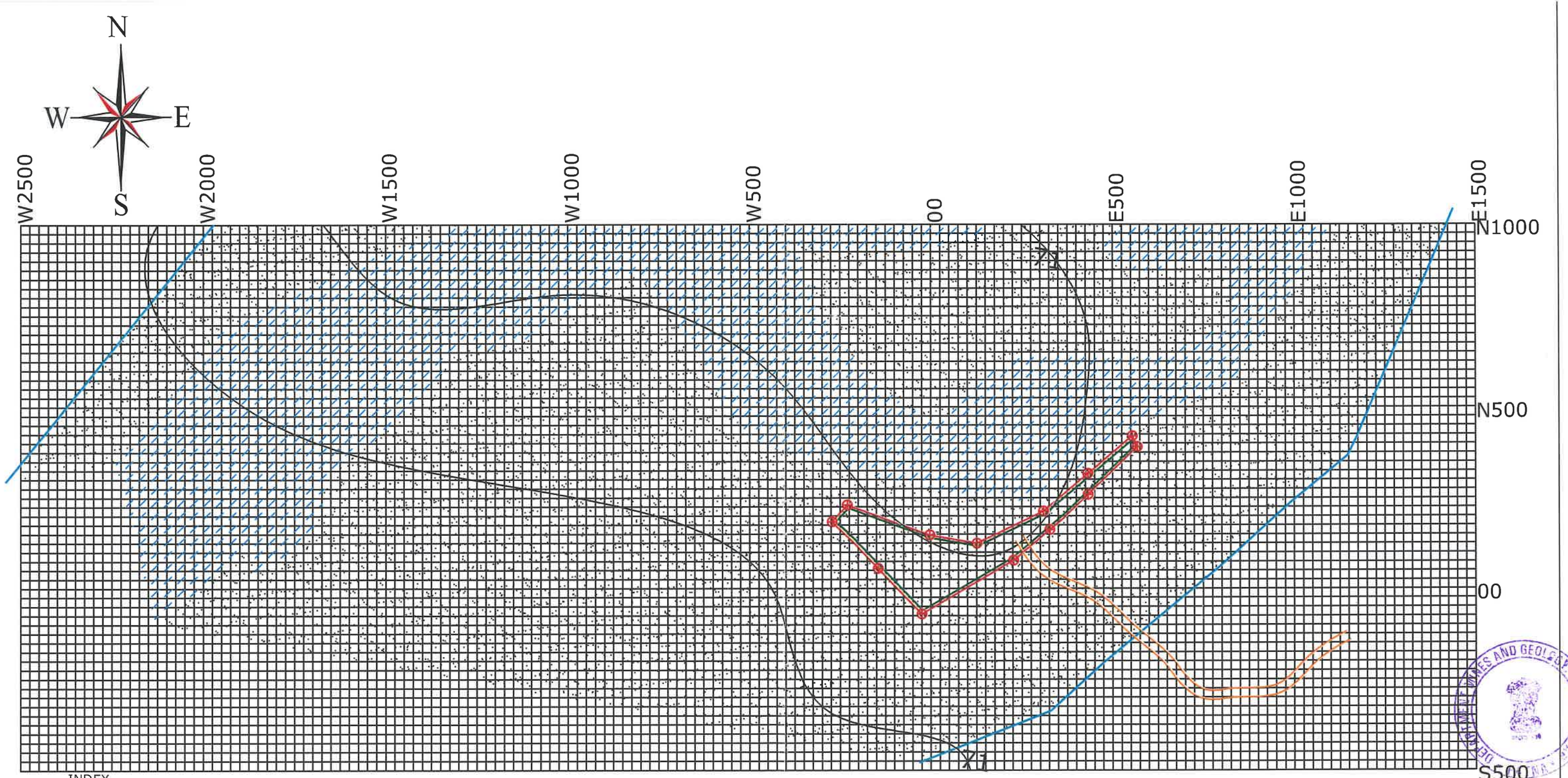
प्राधिकृत समिति की अनुशंसा के आलोक में उपरोक्त शर्त्तों के साथ **अरवल सोन नदी बालूघाट सं0– 05** से संबंधित समर्पित खनन योजना के अन्तर्गत ही बालू उत्खनन् कार्य सुनिश्चित कराया जाय।

विश्वासभाजन

(कमलेश कुमार सिंह)
संयुक्त सचिव

Annexure-III

Plans



INDEX

- APPLIED AREA
- CONTOUR LINE (71)
- GRID LINE
- RIVER WATER
- APPROACH ROAD
- RIVER SAND
- RIVER BED
- 7.5M SAFETY BARRIER
- PROPOSED BOUNDARY P

25.248625	84.649784	25.250082	84.657799
25.24782	84.652276	25.24821	84.655628
25.247705	84.65339	25.247305	84.654468
25.248408	84.655128	25.245901	84.651838
25.250165	84.657477	25.248226	84.649405
25.25034	84.657795	25.248625	84.649784

ARWAL_SON_05 SAND MINE

MOUZA - MAKHDUMPUR,
P.S. - ARWAL, ANCHAL - ARWAL,
DISTRICT - ARWAL, STATE - BIHAR

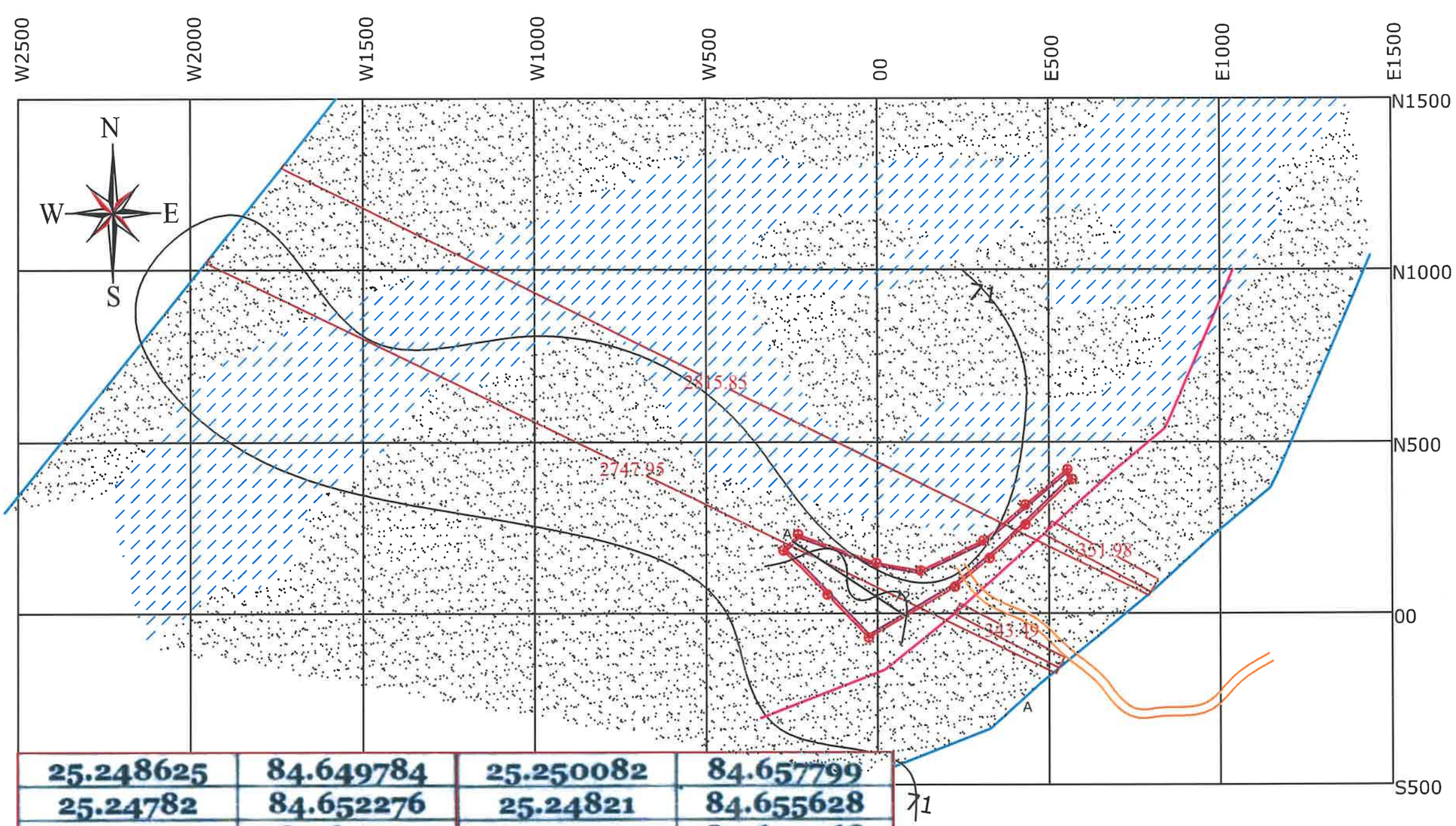
APPLICANT: RADHARAMAN CONSTRUCTION & MARKETING PVT. LTD.,
DIRECTOR - LALTI DEVI

SURFACE PLAN

APPLIED AREA:8.98 HA

SCALE 1:2000	PLATE NO-2

UNITED EXPLORATION INDIA PVT. LTD.
NABET/APA-MPPA/IA/006
DATED - MAR16,2021 TO MARCH 11, 2024



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25.250165	84.657477	25.248226	84.649405
25.25034	84.657795	25.248625	84.649784

INDEX

- APPLIED AREA
- 1/4TH LINE OF RIVER WIDTH
- CONTOUR LINE (71)
- UPL
- GRID LINE
- RIVER WATER
- APPROACH ROAD
- RIVER SAND
- RIVER BED
- 7.5M SAFETY BARRIER
- PROPOSED BOUNDARY PILLARS

ARWAL_SON_05 SAND MINE

MOUZA - MAKHDUMPUR,
P.S. - ARWAL, ANCHAL - ARWAL,
DISTRICT - ARWAL, STATE - BIHAR

APPLICANT: RADHARAMAN CONSTRUCTION & MARKETING PVT. LTD., DIRECTOR - LALTI DEVI

GEOLOGICAL PLAN & SECTION

APPLIED AREA:8.98 HA

SCALE 1:4000	PLATE NO-3

UNITED EXPLORATION INDIA PVT. LTD.
NABET/APA-MPPA/IA/006
DATED - MAR16,2021 TO MARCH 11, 2024

DEPARTMENT MINES AND GEOLOGY, GOVT. OF BIHAR * PATNA *

UNITED EXPLORATION INDIA PVT. LTD. KOLKATA

Annexure-IV

ToR Letter

File No.SIA/1(a)/2087/2022

Goverment of India

State Level Environment Impact Assessment Authority

Bihar

***

To,

M/s RADHARAMAN CONSTRUCTIONS AND MARKETING PRIVATE LIMITED

3rd Floor, Plot no. 388/389, Near Biscuit Factory More, Nasriganj Digha Danapur, Patna, Bihar 800012,

Patna-800012

Bihar

Tel.No.-; Email:radharamanconstruction8@gmail.com

Sub. Terms of Reference to the Proposed Sand Mining Project of Area 8.98 Ha at Arwal Son Ghat 05 on Sone River of District-Arwal State-Bihar, 3rd Floor, Plot no. 388/389, Near Biscuit Factory More, Nasriganj Digha Danapur, Patna, Bihar 800012

Dear Sir/Madam,

This has reference to the proposal submitted in the Ministry of Environment, Forest and Climate Change to prescribe the Terms of Reference (TOR) for undertaking detailed EIA study for the purpose of obtaining Environmental Clearance in accordance with the provisions of the EIA Notification, 2006. For this purpose, the proponent had submitted online information in the prescribed format (Form-1) along with a Pre-feasibility Report. The details of the proposal are given below:

1. Proposal No.:	SIA/BR/MIN/411542/2022
2. Name of the Proposal:	Proposed Sand Mining Project of Area 8.98 Ha at Arwal Son Ghat 05 on Sone River of District-Arwal State-Bihar
3. Category of the Proposal:	Non-Coal Mining
4. Project/Activity applied for:	1(a) Mining of minerals
5. Date of submission for TOR:	21 Dec 2022

Date : 11-01-2023

Mr. Sudhir Kumar
(Member Secretary)

Office : **2nd Floor, Beltron B**
Phone No : Mobile : **9142323035**
Email id : **seiaa.ms.br@gmail.com**

Note : This is auto tor granted letter.

In this regard, under the provisions of the EIA Notification 2006 as amended, the Standard TOR for the purpose of preparing environment impact assessment report and environment management plan for obtaining prior environment clearance is prescribed with public consultation as follows:

STANDARD TERMS OF REFERENCE (TOR) FOR EIA/EMP REPORT FOR PROJECTS/ACTIVITIES REQUIRING ENVIRONMENT CLEARANCE

Terms of Reference (TOR) for preparation of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for "Mining of Minerals" as per the EIA Notification, 2006 has been devised to improve the quality of the reports and facilitate decision-making transparent and easy. TOR will help the project proponents to prepare report with relevant project specific data and easily interpretable information. TOR for mining of minerals is expected to cover all environmental related features.

Mining of minerals plays a positive role in the process of country's economic development. In addition to the contribution towards economic growth, mining can also be a major source of degradation of physical as well as social environment, unless it is properly managed. Environmental impacts can arise during all activities of the mining process. Minimizing the damage due to mining operations depends on sound environmental practices in a framework of balanced environmental legislation. The potential adverse effects of mining activities include air pollution, surface and groundwater pollution, noise and vibration, damage to local ecology, natural topography and drainage, depletion of water resources etc. All these environmental components are required to be considered while selecting a proper methodology of mining, mitigation measures to reduce pollution load, conservation of natural resources etc.

The projects of mining of minerals as stated in the schedule require prior environment clearance under the EIA notification, 2006. Category 'A' Projects are handled in the MoEF&CC and Category 'B' projects are being handled by the respective State Environment Impact Assessment Authorities (SEIAAs) notified by MoEF&CC and following the procedure prescribed under the EIA Notification, 2006. As per this Notification, as amended, the projects of mining of minor minerals with mining lease area equal to or greater than 50 hectare are to be handled at the level of the MoEF&CC for grant of EC. Such projects with mining lease area less than 50 hectare are to be handled by the respective State Environment Impact Assessment Authority (SEIAA).

1(a):STANDARD TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY FOR NON-COAL MINING PROJECTS AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT

1) Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.

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, mining technology etc. 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, topographic sheet, geomorphology and geology of the areashould 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) Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.

6) Details about the land proposed for mining activities should be givenwith information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.

7) It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/ violation of the environmental or forest norms/ conditions? The hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large,may also be detailed in the EIA Report.

8) Issues relating to Mine Safety, including subsidence study in case of underground mining and slope study in case of open cast mining, blasting study etc. should be detailed. The proposed safeguard measures in each case should also be provided.

9) The study rea 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.

10) Land use of the study rea 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.

11) Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

12) A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

13) Status of forestry clearance for the broken up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

14) Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

15) The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

16) A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

17) Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/ Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlifeand copy furnished.

18) A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area, the necessary plan alongwith budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

19) Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.

20) Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects falling under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

21) R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine lease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

22) One season (non-monsoon) [i.e. March-May (Summer Season); October-December (post monsoon season) ; December-February (winter season)]primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM10, particularly for free silica, should be given.

23) Air quality modeling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modeling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

24) The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

25) Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

26) Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided.

27) Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

28) Based on actual monitored data, it may clearly be shown whether working will intersect groundwater. Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter-alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

29) Details of any stream, seasonal or otherwise, passing through the lease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be brought out.

30) Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and bgl. A schematic diagram may also be provided for the same.

31) A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered

under plantation and the species to be planted. The details of plantation already done should be given.The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

32) Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

33) Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

34) Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

35) Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

36) Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

37) Measures of socio economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

38) Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

39) Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

40) Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

41) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

42) A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

43) Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

44) Besides the above, the below mentioned general points are also to be followed:-

a) All documents to be properly referenced with index and continuous page numbering.

b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

d) Where the documents provided are in a language other than English, an English translation should be provided.

e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006-IA.II(I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

h) As per the circular no. J-11011/618/2010-IA.II(I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

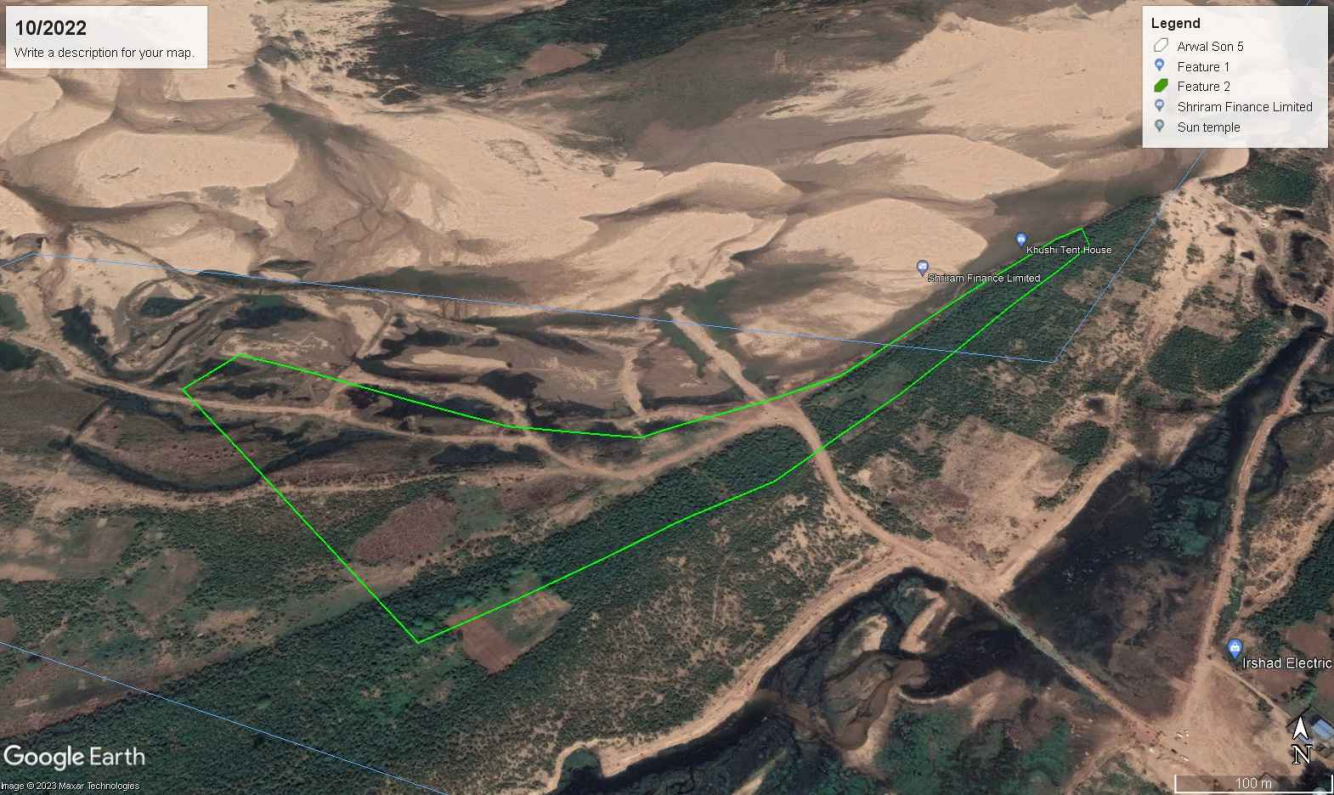
****

Annexure-V

Google Imagery of 3 years


02/2018
Write a description for your map.
Legend
Arwal Son 5
Feature 1
Feature 2
Shriram Finance Limited
Sun temple
Ikbushi Tent House
Shriram Finance Limited
Irshad Electric
Google Earth
Image Landsat / Copernicus
Image © 2023 Maxar Technologies
N
100 m


01/2019
Write a description for your map.
Legend
Arwal Son 5
Feature 1
Feature 2
Shriram Finance Limited
Sun temple
Khushi Tent House
Shriram Finance Limited
Irshad Electric
Google Earth
Image © 2023 CNES / Airbus
N
100 m


10/2022
Write a description for your map.
Legend
Arwal Son 5
Feature 1
Feature 2
Shriram Finance Limited
Sun temple
Khushi Tent House
Shriram Finance Limited
Irshad Electric
Google Earth
Image © 2023 Maxar Technologies
N
100 m

कार्यकारी सारांश

परिचय

MoEF&CC, नई दिल्ली राजपत्र दिनांक **14** सितंबर **2006** और उसके बाद संशोधन के उपरांत, प्रस्तावित खनन परियोजना को श्रेणी **B-1** के रूप में वर्गीकृत किया गया है क्योंकि परियोजना क्षेत्र 5.0 हेक्टेयर से अधिक है। LOI **राधारमण कंस्ट्रक्शन एंड मार्केटिंग प्रा. लिमिटेड, निदेशक। - लालती देवी ऐड- तीसरी मंजिल, प्लॉट नंबर- 388/389, बिस्किट फैक्ट्री मोड़, नसरीगंज, पीओ- दानापुर, पीएस-दानापुर, पटना** के पक्ष में पत्र संख्या- **1150/ख**, अरवल दिनांक **26.10.2022** के माध्यम से प्रदान किया गया था, **5** वर्ष की अवधि के लिए **(LOI** की एक प्रति अनुबंध- I के रूप में संलग्न है)

प्रस्तावित बालू खनन परियोजना खाता संख्या **104** खसरा संख्या **617** में मौजा/ग्राम- **मखदुमपुर, प्रखंड-अरवल, जिला-अरवल (बिहार)। खदान पट्टा क्षेत्र – 8.98 हेक्टेयर घनमीटर 161640 cum या 290952 TPA बालू के उत्पादन के लिए 8.98 हेक्टेयर।**

प्रत्येक खान पट्टे का विवरण तालिका संख्या 1.1 में दर्शाया गया है।

तालिका संख्या 1.1 प्रत्येक खदान के पट्टे का विवरण

क्र0 सं0	बालू घाटों का नाम	आवेदक का नाम	हेक्टेयर में क्षेत्रफल	टन/वर्ष में उत्पादन
1	**अरवल सोन घाट- 05**	**राधारमण कंस्ट्रक्शन एंड मार्केटिंग प्रा. लिमिटेड, निदेशक- लालती देवी ऐड- तीसरी मंजिल, प्लॉट नंबर- 388/389, बिस्किट फैक्ट्री मोड़, नसरीगंज, पीओ- दानापुर, पीएस-दानापुर, पटना**	**8.98**	**290952 TPA**

अनुमानित लागत

परियोजना की अनुमानित लागत तालिका सं 1.2 नीचे दिया गया है।

तालिका संख्या 1. 2 प्रत्येक खदान परियोजना की अनुमानित लागत

बालू घाटों का नाम	कुल परियोजना लागत (लाख)	EMP लागत (लाख)	
		पूंजी लागत	आवर्ती लागत
अरवल सोन घाट- 05	Rs. 325.19	3.9 लाख	7.94

परियोजना विवरण

स्थान

प्रस्तावित खनन पट्टा क्षेत्र भारतीय सर्वेक्षण **G45M7, G45M8, G45M11 & G45M12** के अंतर्गत आता है। प्रस्तावित बालू खनन परियोजना खाता संख्या **104,** खसरा संख्या **617** में मौजा/ग्राम- **मखदुमपुर,** ब्लॉक- अरवल, जिला- अरवल, राज्य- बिहार।

तालिका संख्या 1.3 बालू घाटों के खेसरा नं विवरण

क्र0 सं0	घाट का नाम	खाता न0	खेसरा न0	मौजा/ग्राम	प्रखंड
1	अरवल सोन घाट- 05	104	617	मखदुमपुर	अरवल

साइट के सहयोगी

खदान के पट्टे के कॉर्डिनेट्स नीचे सूचीबद्ध हैं:

तालिका संख्या 1.4 माइन लीज कॉर्डिनेट्स

घाट का नाम	अक्षांश देशांतर		
अरवल सोन घाट- 05	Sl. No	Latitudes	Longitudes
	1	25.248625	84.649784
	2	25.24782	84.652276
	3	25.247705	84.65339
	4	25.248408	84.655128
	5	25.250165	84.657477
	6	25.25034	84.657795
	7	25.250082	84.657799
	8	25.24821	84.655628
	9	25.247305	84.654468
	10	25.245901	84.651838
	11	25.248226	84.649405
	12	25.248625	84.649784

संपर्क:

- NH-139 लगभग 0.84 km towards East.
- नगरीग्राम हॉल्ट रेलवे स्टेशन, लगभग। NW की ओर 22.5 कि.मी की ओर
- पटना हवाई अड्डा, लगभग *58 Km North East* की ओर

परियोजना की प्रमुख विशेषताएं

आवेदक का नाम	क्र0 सं0	बालू घाटों का नाम	आवेदक का नाम
	1	अरवल सोन घाट- 05	राधारमण कंस्ट्रक्शन एंड मार्केटिंग प्रा. लिमिटेड, निदेशक- लालती देवी ऐड- तीसरी मंजिल, प्लॉट नंबर- 388/389, बिस्किट फैक्ट्री मोड़, नसरीगंज, पीओ- दानापुर, पीएस- दानापुर, पटना

नाम	अरवल सोन घाट- 05

ग्राम और तहसील	क्र0 सं0	बालू घाट का नाम	मौजा/ग्राम	प्रखंड
	1	अरवल सोन घाट- 05	मखदुमपुर	अरवल

जिला और राज्य	अरवल, बिहार
खनिज	बालू

क्षेत्र (हेक्टेयर)	क्र0 सं0	बालू घाटों का नाम	आवेदक का नाम	हेक्टेयर में क्षेत्रफल	टन / वर्ष में उत्पादन
	1	अरवल सोन घाट- 05	राधारमण कंस्ट्रक्शन एंड मार्केटिंग प्रा. लिमिटेड, निदेशक- लालती देवी ऐड- तीसरी मंजिल, प्लॉट नंबर- 388/389, बिस्किट फैक्ट्री मोड़, नसरीगंज, पीओ- दानापुर, पीएस- दानापुर, पटना	8.98	290952 TPA

जल की मांग	बालू घाट का नाम	कुल जल प्रपात KLD	घरेलू KLD	धूल का दमन KLD	हरित पट्टा KLD
	अरवल सोन घाट- 05	5.4	0.1	5.0	0.3

खनन

खनन प्रक्रिया बिना ड्रिलिंग और ब्लास्टिंग ओपन कास्ट विधि से है। टिपरों में खनिज की लोडिंग के लिए हल्के वजन के उत्खनन का उपयोग किया जाएगा। बालू खनन के लिए किसी ड्रिलिंग/ब्लास्टिंग की आवश्यकता नही होती है। बालू का **3.0** मीटर की गहराई तक खनन किया जाएगा। बालू का खनन एक खुदाई मशीन के द्वारा कर टिपरों में भरा जाएगा और विभिन्न खरीदारों के पास भेजा जाएगा।

<u>रिज़र्व और उत्पादन</u>

पट्टा क्षेत्र के चारों ओर **7.5** मीटर के सुरक्षा क्षेत्र के लिए छोड़ा जाएगा। खनन की गहराई सतह से **3** मीटर होगी। वॉल्यूम को टन प्राप्त करने के लिए मात्रा को थोक घनत्व **(1.8)** से गुणा किया जाता है। खनन क्षेत्र जो नदी का तल ही मानसून की अवधि में यह नदी तल हर साल भर जाएगा और खदान की गहराई को हर साल नदी बालू से वापस भर देगा और क्षेत्र अपनी मूल स्थला कृति को प्राप्त कर लेगा।

<u>साइट सुविधाएं और केंद्र</u>

जलापूर्ति

श्रमिकों को पीने, घरेलू प्रयोजन और प्रस्तावित परियोजना के लिए पानी की आवश्यकता होगी। धूल दमन के लिए भी पानी उपलब्ध कराया जाएगा। ताजे पानी का उपयोग केवल पीने के उद्देश्य के लिए किया जाएगा। जल की आपूर्ति पास के गांव से उपलब्ध स्रोतों से की जाएगी।

अस्थाई रेस्ट शेल्टर

विश्राम स्थल के पास के श्रमिकों के लिए अस्थायी विश्राम आश्रय की व्यवस्था की जाएगी। इसके अलावा स्थल पर फर्स्टएडबॉक्स उपलब्ध कराया जाएगा । कर्मियों के लिए स्वच्छता सुविधा यानी सेप्टिक टैंक या सामुदायिक शौचालय की सुविधा उपलब्ध कराई जाएगी।

<u>बेसलाइन पर्यावरणीय स्थिति</u>

वायु, ध्वनि, जल, मृदा, वनस्पति और जीव-जंतुओं के लिए प्रस्तावित खनन से संबंधित पर्यावरणीय आंकड़े एकत्र किए गए हैं। **7th** दिसंबर **2022** से **5th** मार्च **2023** तक के दौरान खनन पट्टा क्षेत्र के आस पास **10** किमी की रेडियस दूरी वाले क्षेत्र में बेसलाइन पर्यावरण अध्ययन किया गया।

मौसम विज्ञान

निगरानी अवधि के लिए सारांशित मौसम संबंधी डेटा (**7th** दिसंबर **2022** से **5th** मार्च **2023**) नीचे दिया गया है:

<u>टेबल १.५: - बेसलाइन पर्यावरणीय स्थिति</u>

विशेषता	बेसलाइन स्थिति
परिवेशी वायु गुणवत्ता	8 AAQ निगरानी स्टेशनों के लिए परिवेशी वायु गुणवत्ता अध्ययन से पता चलता है कि PM10 के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः AQ1 पर 73.0µg/m3 और AQ5 पर 56.4µg/m3 है। जबकि PM 2.5 के लिए अधिकतम और न्यूनतम ग्राउंड लेवल सांद्रता क्रमशः AQ1 पर 40.0µg/m3 और AQ4 पर 24.3µg/m3 के बीच होती है। इसी तरह, SO2 के लिए, अधिकतम और न्यूनतम ग्राउंड लेवल एकाग्रता क्रमशः AQ1 और AQ3 स्टेशनों के लिए

	14µg/m3 और 6.7µg/m3 के बीच भिन्न होती है। NO2 के लिए अधिकतम और न्यूनतम जमीनी स्तर की सांद्रता क्रमशः AQ1 और AQ5 स्टेशनों के लिए 24.4µg/m3 और 11.7µg/m3 के बीच भिन्न होती है।
ध्वनि का स्तर	ध्वनि निगरानी अध्ययन से पता चलता है कि दिन के समय न्यूनतम और अधिकतम ध्वनि का स्तर NQ5 पर 46.2 dB (A) और NQ1 पर 65.4 dB (A) दर्ज किया गया। रात के समय न्यूनतम और अधिकतम शोर का स्तर 32.7 पाया गया NQ5 पर dB (A) और NQ1 पर 57.2 dB (A).
जल की गुणवत्ता	5 भूजल नमूने और 4 सतह के पानी के नमूनों का विश्लेषण किया गया और निष्कर्ष निकाला गया कि सभी स्त्रोतों से भूजल पेय के लिए उपयुक्त रहता है क्योंकि सभी घटक भारतीय मानक IS: 10500 द्वारा पेयजल मानकों द्वारा निर्धारित सीमाओं के भीतर हैं। सतही जल विश्लेषण से यह स्पष्ट है कि नमूनों के अधिकांश पैरामीटर CPCB के श्रेणी 'D' मानकों का अनुपालन करते हैं जो पारंपरिक उपचार और कीटाणु शोधन के बाद पेयजल स्रोत के लिए उनकी उपयुक्तता को दर्शाता है।
मिट्टी की गुणवत्ता	पहचाने गए स्थानों से एकत्र किए गए नमूने pH मान को 7.9 से 8.3 तक इंगित करते हैं जो दर्शाता है कि मिट्टी प्रकृति में थोड़ा क्षारीय है। मिट्टी के नमूनों में कार्बनिक पदार्थ 0.9% से 1.3% तक होता है और, जबकि पोटेशियम 74mg/kg से 197.4 mg/kg. तक पाया जाता है।
पारिस्थिति की और जैव विविधता	अध्ययन क्षेत्र में कोई पारिस्थितिक रूप से संवेदनशील क्षेत्र मौजूद नही हैं।

<u>संबंधित पर्यावरणीय प्रभाव</u>

वायु पर्यावरण पर प्रभाव

खनिजों का संग्रह और उठाव अर्धयांत्रिक रूप से किए जाने से एवं कोई भी ड्रिलिंग और ब्लास्टिंग नही होने से उत्पन्न धूल की मात्रा नगण्य होगी। केवल ट्रकों के सड़क परिवहन के वायु प्रदूषण के स्रोत होगें। दिन में दो बार

सड़कों पर पानी का छिड़काव किया जाएगा। इससे धूल उत्सर्जन में और **74** फीसद की कमी आएगी। उत्सर्जन सीमाओं का अनुपालन सुनिश्चित करने के लिए ऑपरेशन के दौरान निगरानी की जाएगी।

जल पर्यावरण पर प्रभाव

मानसून मौसम के दौरान नदी के भीतर या उसके पास से बालू के खनन का भौतिक-रासायनिक प्रभाव आवासीय विशेषताओं पर अप्रत्यक्ष प्रभाव पड़ता है। इन विशेषताओं में धारा खुरदरापनतत्व, गहराई, वेग, टर्बिडिटी, तलछट परिवहन और स्ट्रीम डिस्चार्ज शामिल हैं। खनन के परिणाम स्वरूप बायोटा के लिए हानिकारक प्रभाव, यदि कोई हो, निम्नलिखित के कारण होते हैं:

- नदी के संशोधन के परिणाम स्वरूप प्रवाह पैटर्न में परिवर्तन
- मानसून के मौसम में निलंबित तलछट की अधिकता

  परियोजना गति विधि केवल सोन नदी के सूखे हिस्से में ही किया जाएगा। इसलिए, परियोजना की कोई भी गतिविधियां सीधे जल पर्यावरण को प्रभावित नहीं करते हैं। परियोजना में केवल मानसून के मौसम में किसी भी धारा को मोड़ने या उसे ट्रंकेट करने का प्रस्ताव नही है। नदी **(**मानसून में**)** से पानी की पंपिंग या भूजल का खनन करने के लिए किसी प्रस्ताव की परिकल्पना नहीं की गई है।

भूमि पर्यावरण पर प्रभाव

स्ट्रीम बेड सामग्री का प्रस्तावित निष्कर्षण, मौजूदा स्ट्रीमबेड के नीचे खनन, और चैनल-बेड फॉर्म और आकार में परिवर्तन से चैनल बिस्तर और बैंकों का क्षरण, चैनल ढलान में वृद्धि और चैन आकृति विज्ञान में परिवर्तन जैसे कई प्रभाव हो सकते हैं, यदि, संचालन व्यवस्थित रूप से नही किए जाते हैं। बालू को व्यवस्थित और वैज्ञानिक तरीके से हटाने से बैड क्षीरता नही आएगी। कचरे के रूप में उत्पन्न गाद और मिट्टी का उपयोग पौधरोपण या निचले क्षेत्र को कही और भरने के लिए किया जाएगा। खनन की योजना केवल गैर-मानसून मौसम में बनाई गई है, ताकि हर साल मानसून के दौरान खुदाई किए गए क्षेत्र की भरपाई धीरे-धीरे हो सके।

ध्वनि पर्यावरण पर प्रभाव

प्रस्तावित खनन गतिविधि अर्ध-यंत्रीकृत प्रकृति की है। खनन गतिविधि के लिए कोई ड्रिलिंग और ब्लास्टिंग की परिकल्पना नही की गई है। इसलिए, केवल प्रभाव का अनुमान खनिजों के परिवहन के लिए तैनात वाहनों की आवाजाही के कारण है। वाहनों को अच्छी चालू हालत में रखा जाएगा ताकि ध्वनि को न्यूनतम संभव स्तर तक कम किया जा सके।

जैविक पर्यावरण पर प्रभाव

चूंकि प्रस्तावित खनन वैज्ञानिक तरीके से किया जाएगा, इसलिए बहुत महत्वपूर्ण प्रभाव का अनुमान नही है। मानसून के मौसम में कोई खनन नही किया जाएगा ताकि जलीय जीवन पर प्रभाव को कम किया जा सके जो मुख्यरूप से कई प्रजातियों के लिए प्रजनन का मौसम है। खनन स्थल पर पेड़-पौधे नही हैं, पेड़-पौधों की कोई निकासी नहीं की जाएगी। सड़कों पर पानी का छिड़काव किया जाएगा जो धूल उत्सर्जन को कम करेगा, इस प्रकार फसलों को नुकसान से बचाया जा सकता है।

सामाजिक आर्थिक पर्यावरण पर प्रभाव

क्षेत्र में खनन गतिविधि का प्रभाव क्षेत्र के सामाजिक-आर्थिक माहौल पर सकारात्मक होगा। जब भी जनशक्ति की आवश्यकता होगी तो बालू खनन से स्थानीय लोगों को रोजगार मिलेगा।

<u>पोस्ट परियोजना पर्यावरणीय निगरानी</u>

क्र.सं.	पैरामीटर का वर्णन	निगरानी की अनुसूची
1	हवा की गुणवत्ता	मानसून को छोड़कर प्रत्येक मौसम में सप्ताह में दो बार 24 घंटे के नमूने
2	जल की गुणवत्ता (भूतल और भूजल)	साल में एक बार 4 सीजन के लिए
3	मिट्टी की गुणवत्ता	वर्ष में एक बार परियोजना क्षेत्र में
4	ध्वनि का स्तर	साल में दो बार पहले दो साल और फिर साल में एक बार
5	सामाजिक-आर्थिक स्थिति	3 साल में एक बार
6	वृक्षारोपण की निगरानी	एक बार एक सीजन में

अतिरिक्त अध्ययन

जनसुनवाई

संबंधित अधिकारियों को **EIA** प्रस्तुत करने का प्रारूप तैयार करने के बाद जनसुनवाई कराई जाएगी। जनता और अन्य हितधारकों द्वारा पहचाने गए मुद्दों और मदों को सार्वजनिक सुनवाई मिनटों के रूप में प्रदान किया जाएगा, तदनुसार इसे अंतिम **EIA** रिपोर्ट में शामिल किया जाएगा।

जोखिम आकलन

पूरा खनन कार्य एक योग्य खान प्रबंधक होल्डिंग के प्रबंधन नियंत्रण और दिशा के तहत किया जाएगा। DGMS नियमित रूप से स्थायी आदेश, मॉडल स्थायी आदेश और आपदा, यदि कोई हो, के मामले में खान प्रबंधन द्वारा पालन किए जाने वाले परिपत्र जारी करता रहा है साथ ही खनन कर्मचारियों को सतर्क रखने के लिए समय-समय पर रिफ्रेशर कोर्स में भेजा जाएगा।

आपदा प्रबंधन योजना

आपदा प्रबंधन की योजना में आपात तैयारी एक महत्वपूर्ण पहलू है। कर्मियों को सावधानी पूर्वक नियोजित, के माध्यम से आपातकालीन प्रतिक्रिया में मानसिक और शारीरिक रूप से प्रशिक्षित और तैयार किया जाएगा। इसी तरह संचालन में प्रमुख कर्मियों और आवश्यक कर्मियों को प्रशिक्षित किया जाएगा।

परियोजना लाभ

भौतिक लाभ: सड़क परिवहन, बाजार, हरित आवरण की वृद्धि और सामुदायिक परिसंपत्तियों का निर्माण।

सामाजिक लाभ: रोजगार क्षमता में वृद्धि, राजकोष में योगदान, स्वास्थ्य संबंधी गतिविधियों में वृद्धि, शैक्षिक उपलब्धियां और मौजूदा सामुदायिक सुविधाओं को मजबूत करना।

पर्यावरणीय लाभ:

- नदी चैनल को नियंत्रित करना और किनारों की सुरक्षा।
- बाढ़ के कारण आस-पास की कृषि भूमि के जलमग्न होने को कम करना।
- नदी के जलस्तर में वृद्धि को कम करना।
- अवैध खनन गतिविधि पर पर अंकुश।

<u>कॉरपोरेट एनवायरनमेंटल रिस्पांसबिलिटी</u>

परियोजना लागत की पूंजीगत लागत का 2% शिक्षा, सामाजिक कारणों, स्वास्थ्य देखभाल और पर्यावरण से संबंधित गतिविधियों के लिए कॉर्पोरेट पर्यावरणीय जिम्मेदारी के लिए आवंटित किया जाएगा।

<u>पर्यावरण प्रबंधन योजना (EMP)</u>

- नदी के किनारों के संरक्षण के लिए किनारों से सुरक्षित दुरी को छोड़ कर खनन किया जाएगा।
- खनन कार्य की अधिकतम गहराई क्षेत्र के भूजल स्तर के ऊपर रहेगी।
- बालू खदानों से जुड़े सड़कों पर नियमित अंतराल पर धूल उत्सर्जन की रोकथाम की लिए पानी का छिडकाव किया जाएगा।
- स्वास्थ्य पर पड़ने वाले प्रभावॉ को कम करने के लिए प्रभाव क्षेत्र में श्रमिकों और आसपास के लोगों - को स्वास्थ्य मुहैया कराई जाए।
- वन्यजीव संरक्ष्ण सुनिश्चित की जाएगी और इसके लिए जागरूकता अभियान चलाए जाएंगे।
- खनन कार्य में लगे मजदूरों के स्वास्थ्य की नियमित जाँच की जाएंगी।
- नदी के किनारों और सड़कों के दोनों तरह वृक्षरोपण का कार्य किया जाएगा।
- ऐसी गतिविधियां कम की जाएंगी जिनके फलस्वरूप सूक्ष्म तलछट नदी में पहुंच सके।
- ढुलाई और निकास मार्ग के रखरखाव के चलते परिवहन पर पड़ने वाले भार पर नियंत्रण रखा जाएगा
- परिवहन और बालू ढुलाई के दौरान उत्पन्न होने वाली गडबडी को कम करने के लिए प्रभावशाली उपाय अपनाए जाएंगे :
- संभावित आपदाओं से बचने के लिए समय पर एहतियाती उपाय अपनाने हेतु प्रभावशाली आपदा प्रबंधन योजना क्रियान्वयन किया जाएगा।
- पर्यावरण प्रबंधन प्रकोष्ठ द्वारा प्रभावशाली निगरानी कार्यक्रम का क्रियान्वयन किया जाएगा।

<u>तालिका</u>-1.6*:* **<u>-पर्यावरण प्रबंधन प्रबंधन</u>**

Sl. No	विवरण	पूंजीलागत (lakh)	आवर्तीलागत (lakh)
1	प्रदूषण नियंत्रण और धूलदमन	**Nil**	**4.0**
2	निगरानी i) वायु गुणवत्ता ii) जल गुणवत्ता (सतह और भूजल) iii) ध्वनि की गुणवत्ता iv) मिट्टी की गुणवत्ता	--	2.0
3	एक माली के लिए वृक्षारोपण और वेतन (भाग समय आधार)।	**1.8**	0.5
4	ढोना सड़क निर्माण और रखरखाव	**2.1**	1.44
TOTAL		**3.9**	**7.94**

निष्कर्ष

EIA अध्ययन के आधार पर यह देखा गया है कि धूल प्रदूषण में वृद्धि होगी, जिसे पानी छिड़क कर और पौध रोपण कर नियंत्रित किया जाएगा। खनन गतिविधियों के कारण परिवेशी पर्यावरण और पारिस्थिति की पर एक महत्वहीन प्रभाव पड़ेगा इसके अलावा खनन अभियान से क्षेत्र में प्रत्यक्ष और अप्रत्यक्ष रोजगार सृजन होगा क्षेत्र के आस-पास ग्रीनबेल्ट विकास को प्रभावी प्रदूषण शमन तकनीक के रूप में भी लिया जाएगा, साथ ही खदान के परिसर से छोड़े गए प्रदूषकों को नियंत्रित करने के लिए भी खनन कार्य जारी रहने तक निगरानी कार्यक्रम का पालन किया जाएगा। इसलिए, यह संक्षेप में किया जा सकता है कि खदान के विकास से क्षेत्र के सामाजिक-आर्थिक वातावरण पर सकारात्मक प्रभाव पड़ेगा और क्षेत्र का सतत विकास होगा ।.....

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EXECUTIVE SUMMARY

INTRODUCTION

As per MoEF&CC, New Delhi Gazette dated 14th September 2006 and amended thereof, the proposed mining project is categorized as category B-1 due to project area is more than 5.0 Ha. The District Mining Office, Arwal, through vide letter No. 1150/Khanan, Arwal, dated 26.10.2022 has granted the LOI in favor of Radharaman Construction & Marketing Pvt. Ltd, Director. – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO-Danapur, P.S-Danapur, Patna for the period of 5 years from the date of execution (A copy of LOI is attached as Annexure-I.)

The proposed sand mining project at Arwal Sone Ghat-5 Balu Ghat on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar). Mine Lease Area – 8.98 Ha for production of 161640 cum/Year or 290952 TPA sand.

Details of each mine lease is shown in the table No. 1.1

TABLE NO.1.1 GHAT WISE DETAILS OF SAND GHATS

Sl No.	Name of Sand Ghats	Name of Lessee	Area in hectare	Production in Tonnes/Yrs
1	Arwal Sone Ghat-5 on River Sone	Radharaman Construction & Marketing Pvt. Ltd Director. – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S-Danapur, Patna	8.98	290952 TPA

ESTIMATED COST

The estimated cost of the project is shown in table no. 1.2 given below.

TABLE NO.1.2 GHAT WISE DETAILS OF SAND GHATS

NAME OF THE GHAT	TOTAL PROJECT COST. (Lakhs)	EMP COST Lakhs)	
		Capital Cost	Recurring Cost
Arwal Sone Ghat-5	Rs. 325.19 Lakhs (Including Auction Cost)	3.9 Lakh	7.94

PROJECT DESCRIPTION

LOCATION

The proposed mining lease area falls in Survey of India G45M7, G45M8, G45M11, G45M12. The Proposed Sand Mining Project at Khata no. – 104, Khasra No.- 617 of Arwal Sone Ghat-5 Balu Ghat on Sone River, Area: 8.98 Hectares, Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar).

TABLE NO.1.3 GHAT DETAILS OF SAND GHATS & PLOT

S. No.	Name of Ghat	Area	Khata No.	Khesra No.	Mauza/ Village
1	Arwal Sone Ghat-5	8.98	104	617	Mauza- Makhdumpur, Block – Arwal, District-Arwal (Bihar)

SITE COORDINATES

The mine lease co-ordinates are listed below:

TABLE NO. 1.4 THE MINE LEASE CO-ORDINATES

Coordinates of the Lease Boundary		
Sl no.	Latitudes	Longitudes
1	25.248625	84.649784
2	25.24782	84.652276
3	25.247705	84.65339
4	25.248408	84.655128
5	25.250165	84.657477
6	25.25034	84.657795
7	25.250082	84.657799
8	25.24821	84.655628
9	25.247305	84.654468
10	25.245901	84.651838
11	25.248226	84.649405
12	25.248625	84.649784

CONNECTIVITY:

- NH 139-Approx. 0.84 Km towards East.
- Nagrigram Halt Railway Station, approx. 22.5 Km towards NW.
- Patna Airport, approx. 58 km towards North-East direction.

SALIENT FEATURES OF PROJECT

<table>
<tr><td>Name of the applicant & Address of Lessee</td><td colspan="4"><table><tr><th>Sl No.</th><th>Name of Sand Ghats</th><th>Applicant Name/Address</th></tr><tr><td>1</td><td>Arwal Sone Ghat-5
Balu Ghat:-</td><td>Radharaman Construction & Marketing Pvt. Ltd Director. – Lalti Devi
Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO- Danapur, P.S- Danapur, Patna</td></tr></table></td></tr>
<tr><td>Name of Mine</td><td colspan="4">Arwal Sone 05 Balu Ghat:-</td></tr>
<tr><td>Village& Tehsil</td><td colspan="4"><table><tr><th>S. No.</th><th>Name of Ghat</th><th>Mauza/ Village</th><th>Block.</th></tr><tr><td>1</td><td>Arwal Sone Ghat-5 Balu Ghat:-</td><td>Mauza- Makhdumpur, Block – Arwal, District-Arwal</td><td>Arwal</td></tr></table></td></tr>
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<tr><td></td><td></td><td>(Bihar)</td><td></td></tr>
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</td></tr>
<tr><td>District & State</td><td>Arwal Bihar</td></tr>
<tr><td>Mineral</td><td>Sand</td></tr>
<tr><td>Area (ha)</td><td>
<table>
<tr><th>Sl No.</th><th>Name of Sand Ghats</th><th>Name of Lessee</th><th>Area in hectare</th><th>Production in Tonnes/Yrs</th></tr>
<tr><td>1</td><td>Arwal Sone Ghat-5 Balu Ghat:-</td><td>Radharaman Construction & Marketing Pvt. Ltd Director. – Lalti Devi Add- 3rd Floor, Plot No.- 388/389, Biscuit Factory More, Nasriganj, PO-Danapur, P.S-Danapur, Patna</td><td>8.98</td><td>290950 TPA</td></tr>
</table>
</td></tr>
<tr><td>Water demand</td><td>
<table>
<tr><th>Name of The Ghat</th><th>Total Water Requirement KLD</th><th>Domestic KLD</th><th>Dust Suppressions KLD</th><th>Green belt KLD</th></tr>
<tr><td>Arwal Sone Ghat-5 Balu Ghat</td><td>5.4</td><td>0.1</td><td>5.0</td><td>0.3</td></tr>
</table>
</td></tr>
</table>

MINING

The mining process is opencast semi-mechanized method without drilling & blasting. Light weight excavators will be used for loading of mineral in tippers. No drilling/ blasting are required as the material is loose in nature.

The sand shall be exploited up to depth of 3.0 m. The sand shall be exploited with the deployment of an excavator & filled into tippers & transported to various buyers.

RESERVE AND PRODUCTION

Safety zone of 7.5 meter will be left all around the lease area. Working depth will be 3 meter from the surface. Volume is multiplied by bulk density (1.8) to get tonnes.

It is a river bed deposit and mined out area shall be replenished each year during monsoon period and depth of quarry shall be filled back by river sand each year and area will restore its original topography.

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 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. In addition, First aid box will be made available at the site. Sanitation facility i.e. septic tank or community toilet facility will be provided for the workers.

BASELINE ENVIRONMENTAL STATUS

Environmental data has been collected in relation to proposed mining for Air, Noise, Water, Soil, and Flora & Fauna. The baseline environment study was carried out over an area with radial distance of 10 km around the mining lease area during winter season from 7th December 2022 to 5th March 2023

TABLE 1.5:- BASELINE ENVIRONMENTAL STATUS

Attribute	Baseline status
Ambient Air Quality	The ambient air quality study for the 8 AAQ monitoring stations shows that the maximum and minimum ground level concentration for PM10 is respectively 73.0 µg/m3 at AQ1 and 56.4 µg/m3at AQ5. Whereas the maximum and minimum ground level concentration for PM2.5 ranges between 40.0 µg/m3 at AQ1 and 24.3 µg/m3 at AQ4 respectively. Similarly, for SO2, the maximum and minimum ground level concentration varies between 14 µg/m3 and 6.7 µg/m3 for respectively AQ1and AQ3 stations. For NO2 the maximum and minimum ground level concentration varies between 24.4 µg/m3& 11.7 µg/m3 for respectively AQ1, and AQ5 stations.
Noise Levels	Noise monitoring study reveals that the minimum & maximum noise levels at day time were recorded as 46.2 (A) at NQ5 & 65.4 dB (A) at NQ1. The minimum & maximum noise levels at night time were found to be 32.7dB (A) at NQ5 & 57.2dB (A) at NQ1.
Water Quality	5Groundwater samples and 4 surface water samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards by Indian Standards IS: 10500. From the Surface water analysis it is evident that most of the parameters of the samples comply with 'Category 'D' standards of CPCB are indicating their suitability for Propagation of Wild life and Fisheries.
Soil Quality	Samples collected from identified locations indicate pH value ranging from 7.9 to 8.3, which shows that the soil is slightly alkaline in nature. Organic Matter ranges from 0.9 % to 1.3% in the soil samples and, whereas the Potassium is found to be ranging from 74 mg/kg to 197.4 mg/kg..
Ecology and Bio-diversity	There are no Ecologically Sensitive Areas present in the study area.

ANTICIPATED ENVIRONMENTAL IMPACTS

Impact on Air Environment

The collection and lifting of minerals will be done semi-mechanically. 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.

Water sprinkling will be done on the haul roads twice in a day. This will reduce dust emission further by 74%. Monitoring to ensure compliance with emission limits would be carried out during operation

Impact on Water Environment

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

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

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

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

Impact on Land Environment

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

The systematic and scientific removal of sand will not cause bed degradation. The silt and clay generated as waste will be used for plantation or filling up low lying area elsewhere. The mining

is planned in non- monsoon seasons only, so that the excavated area gets replenished gradually during the monsoons each year.

Impact on Noise Environment

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

Impact on Biological Environment

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

Impact on Socio Economic Environment

The impact of mining activity in the area is positive on the socio-economic environment of the region. Sand mining will be providing employment to local people whenever there is requirement of manpower.

POST PROJECT ENVIRONMENTAL MONITORING

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

ADDITIONAL STUDIES

Public Hearing

The public hearing will be conducted after the draft EIA submission to the Concerned authorities. The issues and items identified by the public and other stake holders will be granted in the form of public hearing minutes, accordingly it will be included in Final EIA report.

Risk Assessment

The complete mining operation will be carried out under the management control and direction of a qualified mine manager holding. The DGMS have been regularly issuing standing orders, model standing orders and circulars to be followed by the mine management in case of disaster, if any. Moreover, mining staff will be sent to refresher courses from time to time to keep them alert.

Disaster Management Plan

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

PROJECT BENEFITS

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

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

Environmental Benefits:

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

CORPORATE ENVIRONMENTAL RESPONSIBILITY

2% of the capital cost of the project cost will be allotted for the Corporate Environmental Responsibility for activities related to education, social causes, healthcare & environmental.

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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

TABLE-1.6 :-ENVIRONMENT MANAGEMENT BUDGET

Sl. No	Description	Capital Cost (lakh)	Recurring Cost (lakh)
1	Pollution Control & Dust Suppression	**Nil**	**4.0**
2	Pollution Monitoring i) Air Quality ii) Water (Surface & Ground) Quality iii) Noise Quality iv) Soil Quality	--	2.0
3	Plantation and salary for one gardener (part time basis).	1.8	0.5
4	Haul road Maintenance Cost	2.1	1.44
TOTAL		**3.9**	**7.94**

CONCLUSION

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by sprinkling of water and plantation. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Green belt development around the area will also be taken up as an effective pollution mitigative technique, as well as to control the pollutants released from the premises of the Mine. Monitoring program will be followed till the mining operations continue. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic environment of the area and lead to sustainable development of the region.

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